

**Phonemic Split in Nen (A44) –
A Case of Tonal Conditioning
of Glottalic Proto-Bantu Consonants**

by Robert Botne

Various studies in the past two decades have addressed the issue of double reflexes of Proto-Bantu stops in the northwestern Bantu languages (cf. Stewart 1973, van Leynseele and Stewart 1980, Gerhardt 1986 to name several). Nen (A44), a Bantu language spoken in Cameroon, has been cited regularly as a clear example of a language exhibiting these double reflexes throughout its stop system. The occurrence of these apparently unconditioned double reflexes has led many Bantuists to conclude that Proto-Bantu had double series of both voiced and voiceless stop consonants, which have been referred to as the "lenis" series and the "non-lenis" or "fortis" series. In opposition to this view, Armin Bachmann (1989) argues in a recent article "Zum 'fortis/lenis-Kontrast' in den nord-westlichen Bantu-Sprachen", that lenis reflexes of Proto-Bantu stops represent the expected, or "normal", development of Proto-Bantu stops in these languages, and that fortis reflexes arise only in certain environments. Specifically, Bachmann claims that there are four fortis-inducing environments: 1) following PB nominal prefixes of classes 5, 9, and 10, 2) preceding the narrow PB vowels *i and *u, 3) preceding long or geminate vowels (*-VV-) and 4) preceding vowel plus prenasalized consonant (*-VNC-). The implication here is that both lenis and fortis reflexes associated with a particular place of articulation and voicing had their origins in one Proto-Bantu sound.

In this paper I will show that evidence from Nen stops clearly supports the reconstruction of double series of stops in Proto-Bantu. However, the relevant distinction between the series was not one of "lenis" versus "fortis", but rather one involving glottalic versus non-glottalic phonation. Furthermore, comparison of Nen with other Bantu languages indicates that linguists have been overly hasty in proposing that the dichotomy of reflexes found in modern Nen reflects a direct evolution from the original contrast in Proto-Bantu. Rather, there has been, particularly in the bilabial stops, a process of phonemic split – conditioned by the presence of a high tone – followed by partial merger. Bachmann's fortis-inducing environments

do appear to have been instrumental in conditioning certain sound changes. However, these changes did not necessarily produce fortis reflexes, nor did they necessarily affect the so-called fortis Proto-Bantu stops alone.

Double reflexes in Nɛn

Van Leynseele and Stewart (1980) have shown that in Nɛn there occur double reflexes of Guthrie's (1967–71) reconstructed stops. These reflexes, which they refer to as fortis and lenis, are listed in (1).

1)	Guthrie	<i>*p</i>	<i>*b</i>	<i>*t</i>	<i>*d</i>	<i>*k</i>
	fortis	<i>f</i>	<i>b</i>	<i>t</i>	<i>l</i>	<i>k</i>
	lenis	<i>h</i>	<i>f</i>	<i>l</i>	<i>n</i>	<i>θ</i>

A few examples (2–3) of the bilabials will serve to illustrate the distinction. The (a) example in each case represents their fortis reflex, purportedly derived from a fortis stop in PB.

	<i>*PB</i>		Nɛn	
2) a.	<i>*pót-</i>	twist	<i>-fótón</i>	straighten a twisted object
b.	<i>*pát-</i>	hold	<i>-hàlèn</i>	capture, catch, take
3) a.	<i>*bút-</i>	bear child, fruit	<i>-bótán</i>	reproduce through germination or gestation
b.	<i>*bòd-</i>	become rotten	<i>-fòn</i>	rot.

Notice that in neither of the (a) examples is there an appropriate fortis-inducing environment as argued for by Bachmann. Nevertheless, so-called fortis reflexes appear. This lack of conditioning environment is the basis for the claim of an original "lenis/fortis" distinction in PB, realized in Nɛn as the *h-f* contrast (corresponding, according to van Leynseele and Stewart 1980, to a PB **p* vs **p* contrast, respectively) and the *f-b* contrast (corresponding to a PB **b* vs **b* contrast). However, this picture is too simple. Not only is there not a simple, direct correspondence between the hypothesized PB lenis/fortis stops and the lenis/fortis reflexes, the relevant feature differentiating the series appears to have been glottalic phonation. In order to observe the shifts accurately, it is necessary to consider sound correspondences across several languages.

Reflexes of Proto-Bantu **b*

Consider reflexes of PB **b* (*** indicates reconstruction by Guthrie 1967–71, parentheses reconstruction by the author) in Nɛn compared with their counterparts in two other zone A languages – Duala A24 and Ewondo A72a – and one zone B language – Punu B43.

	<i>*PB</i>		Nɛn	Duala	Ewondo	Punu
4) a.	<i>*-bàdí</i>	two	<i>-fàndè</i>	<i>-ba</i>	<i>-bé</i>	<i>-béji</i>
b.	<i>*-bínd-</i>	obstruct	<i>-fèndèn</i>	<i>-bènd¹</i>	<i>-fèt</i>	<i>-bindíyə</i>
c.	<i>*-bìd-</i>	boil	<i>-fèn</i>		<i>-bē</i>	
d.	<i>*-bòd-</i>	be rotten	<i>-fòn</i>	<i>-bò</i>	<i>-bōl</i>	<i>-bōlə</i>
e.	<i>(-bùk-)</i>	be big & fat	<i>-fùkùm</i>	<i>-bókò</i>	<i>-bòk</i>	
5) a.	<i>*-bá-</i>	be	<i>-bá</i>	<i>-bè</i>	<i>-bō</i>	<i>-bə</i>
b.	<i>*-béyg-</i>	hate	<i>-bány</i>	<i>-bènà</i>	<i>-fàè</i>	
c.	<i>*-bí;</i>	bad;	<i>-bé</i>	<i>-bé</i>	<i>-bē</i>	<i>-bi;</i>
	<i>*-bíip-</i>	be bad				<i>-bíipə</i>
d.	<i>*-bíd-(ý)</i>	become cooked	<i>-béñ</i>	<i>-béà</i>	<i>-bélā</i>	
e.	<i>*-búd-</i>	kill				<i>-búlə</i>
f.	<i>*-búmb-</i>	mould				<i>-búmbə</i>
6) a.	<i>*-bád-</i>	marry	<i>-bàl</i>	<i>-bá</i>		
b.	<i>*-bàd,</i> <i>-bánd-</i>	split	<i>-bàndè</i>	<i>-bà;</i> <i>-ándá</i>	<i>-bāē</i>	
c.	<i>*-bág-</i>	tie up	<i>-báyén</i>		<i>-fàŋ</i>	<i>-bakíyə</i>
d.	<i>*-báŋg-</i>	open up	<i>-báyòn</i>	<i>-ápà</i>		<i>-bángúə</i>
e.	<i>*-bíŋg-</i>	chase	<i>-bényà</i>			<i>-bíŋgə</i>
f.	<i>(-bób-)</i>	feel	<i>-bóbónèn</i>	<i>-bóbà</i>	<i>-bōb</i>	
g.	<i>*-bòmb-</i>	be soft, wet	<i>-bòmb-</i>			<i>-bombə.</i>

Van Leynseele and Stewart (1980) consider the *[b]* reflexes of Nɛn (examples in 5 and 6) to be reflexes of the same proto-Bantu fortis consonant **b*, the *[f]* examples reflexes of a lenis **b*. Duala and Ewondo also show double reflexes, *[b]* and *[θ]* in the former, *[b]* and *[f]* in the latter. The weak reflex appears whenever the root has a -VNC- sequence. Clearly, the -VNC- environment is not giving rise to fortis reflexes here as Bachmann's hypothesis predicts. Furthermore, in Nɛn we find both *[f]* and *[b]*, lenis and fortis reflexes, before this sequence. Thus, Bachmann is correct in that the -VNC- sequence

does affect the nature of the reflex, but incorrect in suggesting that it gives rise to a fortis reflex.

In Punu there are also fortis and lenis reflexes, but they are not distributed in the same way as in Nen or in Duala and Ewondo. In fact, they appear to be reversed from the situation in Nen. Disregarding the -VNC- conditioning in Duala and Ewondo for the moment, we find that the data in (4-6) suggest three correspondence sets:

- i) *f-b-b-b*
- ii) *b-b-b-b*
- iii) *b-b-b-β*

Van Leynseele and Stewart, as we have noted, would attribute the reflexes in set (i) to a PB lenis stop, those in (ii) and (iii) to a PB fortis stop. However, note that the Nen data manifesting the lenis reflex [f] (4a-e) all have a low tone, while the data in (5a-f) manifesting a fortis reflex [b] all have a high tone. Data in (6) are tonally mixed. These observations suggest that the reflexes in (4) and (5) represent a conditioned split of a PB phoneme, van Leynseele and Stewart's lenis *b; reflexes in (iii) derive from their fortis *b. In Punu, then, lenis *b became modern [b], while fortis *b became modern [β].

In order to alleviate any doubt that these correspondences reflect Bantu in general we can add to the pool of data cognate reflexes from several eastern and southern languages, in particular Masaba (J31), an eastern Bantu language, and Ila (M63), Karanga (S14) and Venda (S21), southern Bantu languages.

*PB		Nen	Ila	Karanga	Venda	Masaba
7) a. *-bàd-	count	-fàn	-bala	-βerenga	-bala	-bala
b. *-bàdì	two	-fàndè	-bili	-βiri	-βili	-βili
c. -bìnd-	obstruct	-fèndèn				
d. *-bìd-	boil	-fèn	-bila	-βira	-βila	-βisa
e. *-bòd-	be rotten	-fòn	-bola	-βora		-βola
8) a. *-bá-	be	-bá	-ba	-βa	-βa	-βa
b. *-béyg-	hate	-bány		-βenga	-βenga	
c. *-bíç	hide	-bí			-βi	-βi
d. *-bí;	bad;	-bé				
	*-bííp-		-bia	-ipa	-βiΦa	
e. *-bíð-(y)	become cooked	-bé	-bizwa	-ibva	-βibva	

*PB		Nen	Ila	Karanga	Venda	Masaba
f. *-bón-	see	-bón	-bona	-βona	-βona	-βona
g. *-bút-	bear fruit	-bótán				
h. *-bímb-	mould		-bumba	-βumba	-βumba	-βumba
9) a. *-bád-	marry	-bàl	-adika		[-mala]	-a
b. -bàd,	split	-bàndè	-anda	-baduka		-ara
	-bánd-					
c. *-bádok-	burst open		-yalula	-balika	-balea	
d. *-bág-	tie up	-báyén	-anga			-onga
e. (-bag-)	shout	-bāy				-anzula
f. *-bāyg-	open up	-bāyòn	-anza		-bonyo-	-anzu-
					lola	lukha
g. *-bòmb-	be soft	-bòmb	[-bomba]			-mbiha.

The examples in (7)-(9) illustrate three sets of correspondences, listed in (10), comparable to those noted previously in the comparison of the northwestern languages. In Karanga [b] was lost in initial position before [i] (8d, e).

- 10) a. *f-b-β-β-β*
- b. *b-b-β-β-β*
- c. *b-θ-b-b-θ*

These sets break clearly into two subsets – 10a/b and 10c. The former subset corresponds to Stewart's (1973) lenis *b, the latter to his fortis *b. In Nen the lenis *b split according to the tonal quality of the root, high tone maintaining the stop, low tone permitting weakening to a fricative.

This same split appears to have occurred in Ila as well. Although in the lists above the reflexes of PB *b in Ila are represented as [b], Smith (1907) provides an interesting comment about a distinction in pronunciation between the b's in the verbs -bala 'count' (7a) and -bona 'see' (8d). The b in -bala, according to Smith, "has a slightly explosive sound", while the b in -bona is "pronounced as b in bone." While the descriptions are inconclusive phonetically, it seems quite plausible that the two sounds are [β] and [b], respectively, where [b] is a lightly imploded or non-explosive stop. If these two examples are representative of the correspondence sets above, then Ila also

appears to have developed a phonemic split on the basis of tonal distinctions.

The claim for tonal conditioning in Nen is supported by other evidence. Van Leynseele and Stewart (1980) mention the case of apparent doublets of certain stems, one appearing with their fortis reflex, the other with lenis, as in (11). A similar case is illustrated in (12): the meaning and reflexes suggest *-*bac*-, perhaps related to Guthrie's *-*pac*- "separate".

11)	*- <i>bíd</i> -	boil up	12)	(- <i>bac</i> -	separate(?))
a.	- <i>bén</i>	boil (solids)	a.	- <i>bás</i>	push to one side
b.	- <i>fén</i>	boil (liquids)	b.	- <i>fàs</i>	push away, to one side.

The examples in (11) may not, in fact, represent lexical doublets as van Leynseele and Stewart suggest. Most likely -*bén* is a reflex of PB *-*bíd*- "become cooked (i.e., boiled)". This would appear to be cognate with Cama *be* and Akan *bīy* "be cooked", Volta-Comoe languages considered genetic sisters to Bantu (Stewart 1973) in which the initial bilabial evolved from a lenis **b*. Whether doublets or not in Nen, the fact remains that high tone accompanies [*b*], low-tone [*f*]. The same can be said of the apparent doublets in (12).

Reflexes of Proto-Bantu **d*'s and **g*'s

Evidence of tonal conditioning can also be found in reflexes of PB **d*'s. Although the data are not as extensive as for the voiced bilabials, they do, nevertheless, suggest that high tone was a crucial factor. Consider the data in (13)–(15).

	PB		Nen	Duala	Ewondo
13) a.	*- <i>dí</i> -	eat	- <i>né</i>	- <i>dá</i>	- <i>dī</i>
b.	*- <i>dób</i> -	fish w/a hook	- <i>ńóf</i>	- <i>ɔbo</i>	- <i>lɔp</i>
c.	*- <i>dúm</i>	bite	- <i>ńóm</i>		- <i>lɔp</i>
d.	(- <i>dét</i> -)	be hard	- <i>nát</i>	- <i>épa</i>	- <i>lèt</i>
14) a.	*- <i>dí</i> -	be	- <i>lé</i>	- <i>è</i>	- <i>nàè</i>
b.	*- <i>díd</i> -	cry	- <i>lèl</i>	- <i>éa</i>	- <i>yí</i>
c.	*- <i>dèm</i> -	be heavy	- <i>lèm</i>	- <i>àmba</i>	

15) a.	*- <i>dók</i> -	rain	- <i>nà</i>		- <i>ńɔy</i>
b.	*- <i>dùàn</i> -	fight	- <i>nùàn</i>	- <i>ana</i>	
c.	*- <i>dùmb</i> -	smell	- <i>nùmb</i>	- <i>nùmba</i>	- <i>nyùm</i> .

Nen reflexes in (13) and (14) are in complementary distribution with respect to their reconstructed tones; original high tone associated with [*n*], low tone with [*l*]. Assuming these to be reflexes of a lenis **d*, then we find that low tone permitted weakening to the liquid [*l*], while high tone precluded such weakening. Subsequently voiced alveolars weakened to [*n*]. This analysis runs counter to that of van Leynseele and Stewart, who propose that [*n*] is the lenis reflex, [*l*] the fortis. This is, in fact, what one finds in Ewondo, where lenis **d* either deleted or became [*n*] preceding a low tone, but became [*l*] preceding a high tone. But note that in Ewondo fortis **d* weakend to [*n*], as in Nen, suggesting that the weakening of this segment was independent of that for the lenis stop. If that were the case, then it is most plausible that weakening of the lenis stop in Nen did not affect segments before a high tone. Subsequent weakening of alveolars then affected both voiced alveolars, [*d*] and [*d'*].

Reflexes of **g* are difficult to interpret. Only six verbs could be discovered, four of which have [*k*] as a reflex (16), the other two [*θ*] (17). Moreover, each was reconstructed with a low tone.

	PB		Nen	Duala	Ewondo
16) a.	*- <i>gènd</i> -	go	- <i>kènd</i>		- <i>kè</i>
b.	*- <i>gò</i> -	fall	- <i>kò</i>	- <i>kó</i>	- <i>kù</i>
c.	*- <i>gòn</i> -	snore	- <i>kòny</i>	- <i>kòyò</i>	- <i>kòy</i>
d.	*- <i>gùd</i> -	buy	- <i>kòl</i>		- <i>kùs</i>
17) a.	*- <i>gàb</i> -	divide	- <i>àf</i>	- <i>àbà</i>	- <i>kàp</i>
b.	*- <i>gàdud</i> -	come back	- <i>ánón</i> .		

Whether these constitute reflexes of lenis and fortis *g*'s or conditioned reflexes of one original *g* is not possible to ascertain on a principled basis. For that reason we will not consider them further in this paper.

Although tone appears to have been the relevant conditioning factor in whether or not voiced stops other than *g* weakened in Nen, I am unaware of any other language in which tone has affected consonantal behavior. There are southern Bantu languages, such as Zulu, in which voiced consonants affect the behavior of tone, but none in

which the reverse situation occurs. Before considering why and how tone interacts with these consonants in Nen, we will first consider the behavior of voiceless bilabials.

Reflexes of Proto-Bantu *p

A comparison of reflexes of Guthrie's *p across several languages, as in the case with *b, supports the view that there were more than one PB voiceless bilabial stop. The data in (18)–(21) illustrate different correspondences among the languages.

	*PB	Nen	Punu Ila	Karan-	Masaba
18) a.	*pá(-an)- give	-hán	-bé:γa-pa	-pa	-ha
b.	*pád- scrape		-βálá -pala	-parira	-hala
c.	*pèēm-, breathe -púúm-	-hēm	-βú:- mā	-foma	-fema
d.	*pindud- stir up	-hùl	[-ipinda]	-pindura	
e.	*pód- cool down		-βólá	-pora	-hosa
f.	*póp speak	-hó	-βósa		
g.	(-pòt-) rest, breathe	-hòt			-hola
h.	*pùd- strip leaves	-hùl	-pulula		-hulula
19) a.	*pát- hold	-hàlèn	-pá- túlá	-bata	
b.	*pápat- grope		-ampasha	-bama- dzira	-aβaaβa
c.	(-pék-) be beauti- ful	-hèk	-ebeka		-an- khisa
d.	(-piad) go back	-hían		-bírira	-ilayo
e.	*pùγγ- blow	-húk	mu- pùγγa wind	-unga	
f.	*(y)ipud- take off the fire	-húli	-yuta	-bura	

	*PB	Nen	Punu Ila	Karan-	Masaba
20) a.	*pák- rub	-fákál		-pikisa	-akha
b.	*pákik- hang up	-fàγè		-pangika	-ani- khila
c.	*pép- winnow			-pepa	-pepeta
d.	*pèèp- blow	-féf	-pě:pə	-pepuluka	-pepe- reka
e.	*píágid- sweep	-fál (?)		-pela	-eya
f.	*pìnd- plait	-fénd			
g.	*pùk- shake	-fúk; -húk			
h.	*pót- twist	-fót	-pótə	-potana	-poshon- ga
21) a.	*pàc-ud- separate	-básón	-pǎ:sə		-pasula -banzu- ra/ -βazura
b.	(-panj-) be dry, cracked	-bány			-paya -bandira
c.	(-papad-) thunder	-bámén			-papa- nukha
d.	*púm-; hit and -pám- kill	-búm	-uma		-bamura
e.	*pùp-; flap -pàp- wings	-bʷəm; -pǎpə -fáfàl			-papala -baba- mira.

From these data emerge four sets of correspondences, all ostensibly derived from Guthrie's reconstructed *p:

- i) h-β-p-p-h [data in 18];
- ii) h-p-θ-b-θ [data in 19];
- iii) f-p-p-p-θ [data in 20];
- iv) b-p-θ-p-b [data in 21].

I will argue that set (i) represents reflexes of van Leynseele and Stewart's lenis voiceless stop, sets (ii)–(iv) reflexes of their fortis voiceless stop. Note first that Cama (mentioned previously) has the apparent cognate from *pu* "blow" (compare 17e) with a fortis [p] rather than a lenis [p] (Stewart 1973), lending support to the claim for set (ii) as representing a fortis reflex. Stewart (1973: 31) also reconstructs *pì "burn", whose reflexes (–; –βi; –pia; –pisa; sya (< *pia in Masaba)) in the Bantu languages fall into the lenis pattern

in (i). A second difference between the data in (18) and (19) (reflexes in sets (i) and (ii), respectively) is apparent in the tonal reflexes in Nen. For the data in (18), whose initial consonants derive from a lenis **p*, the tones match exactly those reconstructed by Guthrie (1967-71) for Proto-Bantu. For (19), whose data reflect a fortis **p*, the tones are generally reversed from the reconstructed tones.

The tonal factor can also be observed in the data in (20) and (21). In the Nen examples in (21) high tone appears in all but one example, regardless of reconstructed tone. In (21) there is the high tone, but also invariably a low and/or back vowel. There are also two instances of a low vowel in (20), which destroy the complementary distribution of the low back vowels. However, the data are taken to be suggestive of the conditioning environments, not necessarily exact. If the data in (19), (20) and (21) all illustrate reflexes of an earlier fortis **p*, then what has occurred is a split that differentiated reflexes according to the intensity of the pitch and (apparently) the nature of the vowel.

Further support can be garnered from an apparent case of etymological doublets, given in (22).

- 22) a. *-hâl* pull off leaves from a branch; pull out a splinter
 b. *-fâl* remove leaves from a branch with a machete; remove spines from a palm branch.

Again the stronger reflex *[f]* is associated with the high tone, the weaker reflex *[h]* with low tone. Note that the alternation in (21e) reflects conditioning environments for *[b]*, not *[p]*, suggesting that lenition of fortis **p* preceded lenition of lenis **b*. Thus, the following progression, illustrated with the root **-pàp-*, must approximate the changes in Nen.

- 23) **-pàp-* reconstructed Proto-Bantu root
-báb- **p > b*, with concomitant shift of L to H
-bʷáb ~ *-bàbàl* *b > bʷ* preceding *b* in same syllable;
 [addition of suffix *-al* reverses root tone and creates disyllabic form *w/b*'s in separate syllables]
-bʷám ~ *-fàfàl* *b > f/ʃ_è, > m/_ʃ*

Fortis **p*, then, appears to have split in Nen into *[h]*, *[f]*, and *[b]*, with high tone and vowel quality as the conditioning factors; lenis **p*

simply weakened to *[h]*. This lenition process seems to have affected the voiceless stops together, having differential effects in the fortis data. Specifically, fortis **p* weakened proportionally with respect to the backness of the following vowel and the intensity of the pitch. That is, weakening was not as extensive if the environment included a back vowel and/or a high tone. This difference is summarized in the figure below, listing reflexes and environments from the strongest to the weakest.

$$\begin{array}{rcl} *p \text{ (fortis)} & > & b/_\acute{a} \\ & > & f/_\acute{é} \\ & > & h/_\acute{è} \\ *p \text{ (lenis)} & > & h \end{array}$$

Consider now the reflexes of lenis **p* and fortis **p* in the other languages examined. These are summarized in (24).

24) Reflexes of lenis **p* and fortis **p* in 6 Bantu languages

PB	<i>*p</i>		<i>*p</i>	
Nen	<i>h</i>	<i>h</i>	<i>f</i>	<i>b</i>
Ila-	<i>p</i>	\emptyset	<i>p</i>	\emptyset
Karanga	<i>p</i>	<i>b</i>	<i>p</i>	<i>b</i>
Venda	Φ		<i>p</i>	
Punu	β		<i>p</i>	
Masaba	<i>h</i>	\emptyset	<i>p</i>	

Ila and Karanga, like Nen, have undergone a split of fortis **p*. However, in these languages there is only a two-way split. This result can be readily accounted for through tonal changes that occurred in Nen, but not in Ila or Karanga. Re-examination of the relevant data (21) shows that Nen changed PB low tones to high tones. If these roots remained (or became) low-toned in Ila and Karanga, we would expect fortis **p* to have undergone the normal weakening process for the low-toned environment, i.e., to have weakened to *[θ]* and *[b]*, respectively, which is what we observe. Hence, we can conclude that these roots behaved as did other low-toned roots in these two languages having an initial fortis **p*.

Masaba is the only other language that developed a split. In this case fortis **p* remained a stop only in the special environment of low back vowel and (presumably) high tone. Otherwise, it became deleted.

Reflexes of *t*'s and *k*'s in Nen

Analysis of voiceless bilabials in Nen has suggested that they, like their voiced counterparts, were influenced by tone during weakening. What of voiceless *t*'s and *d*'s? Unfortunately, examples are few in Nen, and even more difficult to find across several languages. Nevertheless, there are some suggestive hints. Consider data for reflexes of *k* in Nen (25), and comparatively with several examples from Punu (26)–(28).

25) Reflexes of Proto-Bantu **k* in Nen

P-B		Nen	P-B		Nen
*-kànt-	cut	-kànd	*-káng-	roast	-ángg
*kòdum-	growl	-kòlòl	*-kòb-	close w/hook	-òf
*-kùd-	scrape	-kól	*-kócud-	cough	-ósón

P-B		Nen	Duala	Ewondo	Punu
26) *-kócud-	cough	-ósón	-ósea	-kóε	-kótsúlə
27) *-káng-	roast	-ángg	-ánga	-yāŋ	-yánggə
*-kòb-	close w/hook	-òf		-wóman	
28) *-kùd-	scrape	-kól		-wōŋ	-yùlə.

Given the patterns observed for reflexes of *p*'s, these few data suggest that lenis **k* was deleted in Nen and Duala (26), but became [k] in Ewondo and Punu. Fortis **k* was realized as [ɣ] in Punu, [θ] in Ewondo, but split in Nen (27–28). The puzzling aspect of this is that the tones are the reverse of what one would expect in Nen.

The situation with *t*'s in Nen is even less clear. As the data indicate, all the forms collected are reconstructed with a high tone. In several instances these are realized as low in Nen, but there is no consistent pattern.

	PB		Nen	Duala	Ewondo
29) a.	*-támb-	set a trap	-lám̃b	-lám̃ba	-lām
b.	*-tátu	three	-lál̃	-lál̃o	-lā
c.	*-téng-	be leaning	-léyè	-éyè	
d.	*-túm-	send	-lóm̃	-lóm̃a	-lōm
30) a.	*-támb-	call	-tám̃b	-ám̃ba	
b.	*-tób-	pierce	-tób̃	-túb̃a	-tūp

c.	*-tí-	spit	-tú	-t́	-túí
d.	*-túyín-	become blunt	-tùl	-túna	-tùl
31) a.	*-téék-	put down	-ték	-té	-lē
b.	*-túúg-	draw water	-tók	-tóa	-lô
32) a.	*-tááno	five	-lán	-tánu	-tán
b.	*-tóód-	take	-lón		-t̃ε.

The data suggest that lenis **t* became [l] in all three languages (29), fortis **t*, [t] (30). But what of the data in (31) and (32) in which Nen and Ewondo have reverse reflexes? I have found no principled basis for a decision here. However, noting that Nen only seems to realize splits in fortis voiceless consonants, one might surmise that both are reflexes of fortis **t*. A more satisfactory answer must await further investigation.

From the observations and discussion of stops in Nen, it appears that the predominant factor in the evolution of lenis voiced stops and fortis voiceless stops was the presence of high tone. However, one does not expect tone to influence segmental weakening. Let us turn now to a consideration of how and why tone could be a relevant factor in the changes observed in Nen.

Tone as a conditioning factor

In both voiced and voiceless stops in Nen (though more evident in the voiced), high tone appears to have been the crucial conditioning factor. However, such a conditioning factor appears odd because there is no obvious reason why high tone should affect lenis/fortis consonants differentially. Furthermore, we have seen that phonemic splits occurred with lenis *b*, but fortis *p*. One would have expected both lenis series to have been affected, or both fortis, but not one of each. What is lacking here is phonological motivation for differential weakening. Motivation for such differential weakening can be found by reconsidering the relevant features of the Proto-Bantu stops. Lenis and fortis, rather than being treated as primary features of the stops, should be treated as secondary, relative characteristics. The primary feature distinguishing the stop series should be glottalic phonation. That is, Proto-Bantu would have had a glottalic series of stops paired with a non-glottalic series, as in (33).

33) Proto-Bantu bilabial stops

	-vox	+vox
-glot	<i>p</i>	<i>b</i>
+glot	<i>p'</i>	<i>ɓ</i>

Reconstruction of a glottalic series provides phonological motivation for both of the seeming incongruities noted above. First, it motivates the differential effect on fortis **p* but lenis **ɓ*. In this alternative reconstruction to the van Leynseele and Stewart proposal, glottalic (or ejective) **p'* is equivalent to their fortis **p*, and glottalic (or implosive) **ɓ* to their lenis **ɓ*. Their notion of a fortis/lenis contrast is a secondary characteristic inherent to a glottalic/non-glottalic contrast: voiceless ejectives are "fortis" in comparison to a voiceless oral counterpart, whereas voiced implosives are "lenis" in comparison with their oral counterparts. The set of bilabial stops in Proto-Bantu, then, might be more insightfully represented in an asymmetrical arrangement, as in (34), in which glottalic sounds are central, and the fortis partner of the voiced or voiceless pair is uppermost.

34) Proto-Bantu bilabial stops as relatively fortis/lenis

	-vox	+vox
		<i>b</i>
+glot	<i>p'</i>	<i>ɓ</i>
	<i>p</i>	

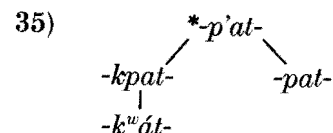
Thus, what is odd and seemingly unexplained in the van Leynseele and Stewart analysis becomes straightforward in this one — only glottalic consonants were affected by the tonal conditioning environment.

With respect to the second seeming incongruity — that of high tone as a conditioning factor — a glottalic series provides a phonological basis for its use. Both tone and glottalic phonation are determined by the state of the glottis. High tone, which is associated with greater tension in the vocal cords, was found to inhibit weakening of the glottalic consonants, which require initially closed vocal cords. Low tone, on the other hand, which is associated with more relaxed vocal cords, permitted glottalic consonants to weaken or, in some instances, simply to lose their glottalic gesture.

This proposed reconstruction of glottalic series in Proto-Bantu fits neatly with typological observations on occurrence of glottalic stops. In the voiceless series, presence of glottalic [*p'*] implies presence of

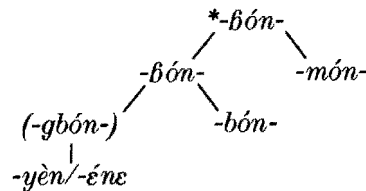
glottalic [*t'*] and [*k'*]. As noted in the first section of this paper, van Leynseele and Stewart have shown that Nēn has double reflexes for *p*, *t*, and *k*, i.e., both a glottalic and non-glottalic series within the proposed analysis. In the voiced series of glottalic stops, the implicational hierarchy is the opposite of that for the voiceless; it is the presence of [*g*] that implies [*d*], and [*d*] implies [*ɓ*]. In Nēn double reflexes of *d* and *b* occur, but not of *g*.

Additional evidence offering support for a glottalic series in Proto-Bantu can be adduced from close examination of several of Guthrie's common Bantu reconstructions. Consider first the two roots **-kúát-*, **-p'át-* "seize" and **-pát-* "hold". Guthrie indicates a distribution of reflexes that is neatly complementary, generally western with some northeast and southeast occurrence for **-kúát-*, generally eastern with some northwest and southwest occurrence for **-pát-*. Could these roots be derived from one etymon? While semantically close, the [*ku*] versus [*p*] difference nevertheless poses a problem. However, in Ewondo we find as a reflex of **-papat-* "grope" the form *-kpat* "touch". Another example is *-kpéla* "scorn", which in Nēn is *-yáɓɓl* "jeer, scoff at". If we assume an original glottalic **p'* as the source of the labial-velar [*kp*], it is only a small change to [*k*] when weakening occurs. Thus, a sound change such as that indicated in (35) for glottalic **p'* could both account for the differences in form and provide motivation for the complementary distribution of the word.



A similar case can be made with respect to glottalic **ɓ*. Consider the situation with Guthrie's common Bantu reconstructions for "see": **-bón-*, **-món-*, **-yén-*. Again there is a semblance of complementary distribution among these forms — **-bón-* throughout the east and in some northwest languages; **-món-* throughout the west and in some northeast and central eastern languages; **-yén-* in some northwestern and central western languages. Stewart (1973) indicates that lenis *ɓ* (lightly imploded) in Cama is perceptually between [*b*] and [*m*]. If we assume a glottalic **ɓ* in Proto-Bantu, and a pattern of sound change similar to that for **p'*, then we can account for each of the different forms of "see".

36)

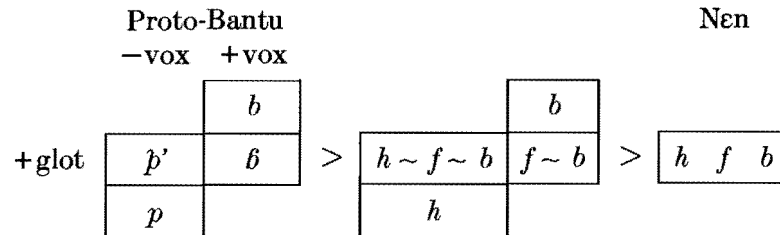


A shift from [b] to a labial-velar [gb], though parallel to that noted for *p', is not directly attested. However, in Ewondo and Duala we find -yèn and -éne, respectively, and in both languages [g] was deleted. We have seen that some *b's in Ewondo became [b] (see examples in 4-5), but there may have been a split in which some became [gb], which was subsequently deleted as for "see". I have not been able to discover other evidence for this at this time.

Evolution of the bilabial sounds

The analysis proposed here has argued that Nen [h], [f] and [b] evolved from glottalic and non-glottalic bilabial stops in Proto-Bantu through general processes of weakening. While it is not possible at this time to state explicitly how the changes progressed in the language, a plausible and likely scenario would have the glottalic stops undergoing weakening and a split, followed by weakening of the non-glottalic *p. This sequence is outlined in (37).

37)



The effect of the sound shifts was to reduce four consonants to three, with each new sound a merger of reflexes of two or more Proto-sounds. Important to these shifts was the tonal quality of the root, with high tone affecting the nature of weakening in the glottalic series. However, while of obvious importance, it has not been possible to investigate the shifts in tone themselves.

Nen was not the only language to have experienced the phonemic splits in the glottalic consonants. The table in (38) lists the bilabial

reflexes for all the languages discussed previously, illustrating the complexity of some of the changes.

38) Reflexes of bilabial stops with respect to cognates in Nen

PB	*p	*p'	*b	*b
Nen	h	h f b	f	b
Ewondo	f	b/kp	b/f	b/f (> f/_VNC)
Duala	p	∅ b	b	b
Masaba	h	∅ p	β	∅
Ila	p	∅ p	β	b
Karanga	p	b p	β	b
Venda	Φ	p	β	b
Punu	β	p	b	β

Though all the languages have lost the glottalic gesture, all but two retain traces of the existence of both the voiced and voiceless glottalic/non-glottalic distinction. Five languages experienced phonemic splits, primarily in the voiceless glottalic *p'. Nen and Ila exhibit the same split in the voiced implosive *b; Ewondo also exhibits a split of *b, but it is the result of a different conditioning environment, -VNC- rather than high tone.

In sum, the languages investigated here indicate that bilabial stops in Bantu were of two kinds, glottalic and non-glottalic. Glottalic stops lost their glottalic gesture, and in many cases weakened significantly. In some languages they split. Non-glottalic stops also underwent weakening, though the data suggest that this process was independent of the glottalic weakening.

Conclusion

Comparative analysis of data from Nen and other Bantu languages from the northwest, the northeast and the south supports the conclusion reached by van Leynseele and Stewart (1980) and others that Proto-Bantu had double series of voiced and voiceless stop consonants. However, the analysis does not support a reconstructed system in which lenis and fortis constitute relevant phonological features. Rather, the crucial feature appears to have been glottalic phonation. If correct, then Proto-Bantu must be reconstructed with glottalic and non-glottalic stops.

Secondly, the analysis demonstrates that modern "lenis and fortis reflexes" in Nen do not descend directly from single ancestors in Pro-

to-Bantu, but rather are the result of phonemic splits and subsequent mergers. Of particular significance with respect to these phonemic splits in Nen is that they appear to have occurred only in originally glottalic segments, with tonal quality of the syllable as the significant conditioning factor.

The verb roots examined here provide no support for Bachmann's fortis-inducing environment analysis. Nevertheless, the hypothesized environments do appear to have played a role in determining the nature of sound shifts in some languages, though not in Nen.

Notes

* I would like to thank Stuart Davis and Jonni Kanerva for discussion and comments on several of the issues raised here.

¹ Reflexes with [ɸ] are from Guthrie (1971). Other sources do not indicate an implosive stop.

References

- Bachmann, Armin, 1989: Zum "fortis/lenis-Kontrast" in den nord-westlichen Bantu-Sprachen; in: *Afrikanistische Arbeitspapiere* 19: 23–31.
- Dugast, Idelette, 1967: *Lexique de la langue Tunen*. Paris: Librairie C. Klincksieck.
- Gerhardt, Ludwig, 1986: The fortis/lenis contrast in pre-Bantu? Some northwestern Bantu evidence; in: *Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschung* 39,5: 540–547.
- Guthrie, Malcolm, 1967–71: *Comparative Bantu*, vols. 1–4. Farnborough: Gregg Press, Ltd.
- Louw, C. S., 1915: *A Manual of the Chikaranga Language*. Bulawayo, Rhodesia: Philpott and Collins.
- Nsuka-Nkutsi, François, 1980: Quelques reflexes du Proto-Bantou en Punu; in: *Eléments de description du Punu*, F. Nsuka-Nkutsi (ed.), Université Lyon II, Pp. 129–178.
- Siertsma, Berthe, 1981: *Masaba Word List: English-Masaba, Masaba-English*. Archives d'Anthropologie No. 28, Tervuren: Musée Royal de l'Afrique Centrale.

- Smith, Edwin, 1907: *A Handbook of the Ila Language*. Oxford (Republished 1964 by The Gregg Press, Ltd., Ridgewood, N.J.)
- Stewart, John, 1973: The lenis stops of the Potou Lagoon languages and their significance for pre-Bantu reconstruction; in: *Papers in Ghanaian Linguistics*, supplement No. 4, 1–49.
- van Leynseele, Hélène and John Stewart, 1980: Harmonie consonantique en pré-Nèn; in: *L'expansion bantoue*, L. Bouquiaux (ed.), vol. 2. Paris: SELAF. Pp. 421–433.
- Wentzel, P. J. and T. W. Muloiwa, 1982: *Venda, Afrikaans, English Improved Trilingual Dictionary*. Pretoria: University of South Africa.