

THE CONSONANTS OF PROTO-GUANG

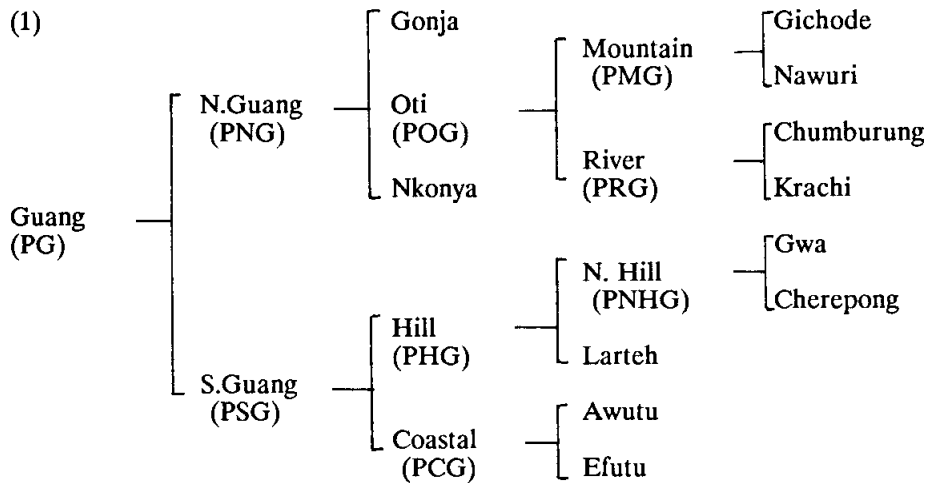
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In Snider (1989b) I describe the vowel system of proto-Guang and trace innovations to that system which have been implemented by subsequent subgroups and present-day languages. The present paper¹ parallels that work by describing the consonant system of proto-Guang and by tracing subsequent innovations to that system through to the present. Among the innovations discussed are three which support the genetic unity of the North Guang branch. Until the present, the validity of claims which support the existence of this node has rested upon only a single innovation, i.e. that first proposed in Stewart (1970) and confirmed in Snider (1989b). This greatly strengthens, then, the claims for the North Guang branch.

Dans ma description du système vocalique du proto-guang, Snider (1989b), j'ai relevé les innovations à ce système qui avaient atteint les sous groupes postérieurs et les langues actuelles. La présente étude est pareille à ce travail-là en tant qu'elle fait une description du système consonantique du proto-guang et retrouve les innovations ultérieures à ce système jusqu'à présent. Parmi les innovations étudiées, il y en a trois qui soutiennent l'unité génétique de la branche guang-nord. Jusqu'à présent, la validité de revendications justifiant l'existence de ce noeud dépendait d'une seule innovation, à savoir celle qui a été proposée par Stewart (1970) et confirmée par Snider (1989b). Donc, cette étude va renforcer plus fortement les revendications de l'existence de la branche guang-nord.

0. INTRODUCTION

The Guang language group consists of some fifteen languages spoken by societies that tend to be grouped mostly in a large crescent that loosely follows the Volta River in Ghana. The genetic unity of this group is well-established (cf. Westermann 1922, Goody 1963 and Painter 1967) and the group forms a branch of Tano within Stewart's (New) Kwa (see Stewart 1989). I consider the genetic relationships expressed in (1), below, to hold for the Guang languages of this study, based on Snider (1988) and the present work.



In the present study, I attempt to reconstruct the consonant system of the latest common ancestor of the present-day Guang languages. This is based mainly on two

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sources (Snider 1989a and Stewart 1966), both of which are comparative lists involving the same 850 item wordlist. Unless indicated otherwise, examples in this study are taken from the following sources:

Gonja	Snider 1989a
Chumburung	Snider 1989a
Krachi	Snider 1989a
Gichode	Snider 1989a
Nawuri	Snider 1989a
Nkonya	Stewart 1966
Larteh	Stewart 1966
Cherepong	Snider (unpublished field notes)
Gwa	Snider (unpublished field notes)
Awutu	Stewart 1966
Efutu	Snider (unpublished field notes)

Where data is taken from a source other than that stated, this is indicated by one of the following abbreviations:

(FG)	Forson and Gingiss 1977
(P)	Painter 1972
(P67)	Painter 1967
(R)	Rapp 1957
(SN)	Snider (unpublished field notes)
(ST)	Stewart 1966

Since a knowledge of proto-Guang syllable structure will help the reader, I draw attention to the salient facts. By far the most frequent syllable type has the structure CV, with no restrictions on which consonants may occur in the C slot. Syllables of the type V, though frequent, only occur as noun class prefixes affixed to noun and verb stems. Also fairly frequent is the syllable type CVN, in which the nasal coda's place of articulation assimilates to that of a following consonant if there is one (even across word boundaries, but within phonological phrases).

Less common is the syllable type CV^h. Such a syllable only occurs word finally, and the glottal stop itself is realized only utterance finally. Snider (1986) makes a case for recognizing a process in Guang languages whereby those words which have historically undergone apocope, i.e. loss of a final segment or segments, are realized synchronically with a glottal stop in utterance-final environments (cf. Dolphyne 1984, Stewart 1962, 1976 for recognition of similar processes in (related) non-Guang languages).

1. THE PG SYNCHRONIC PICTURE

1.1 NATURAL CLASSES

We look now at the consonant system reconstructed for proto-Guang (PG). Without taking into account certain distributional facts, I reconstruct the following consonants.

(2) Surface consonants of proto-Guang

f	s				
p	t	č	k	kp	ʔ
m	n	ɲ	ŋ		
b	d	j			
	r				
	l	y	w		

Since reference is made throughout the paper to various natural classes, the feature chart in (3) is provided as an aid to the following discussions. This chart employs an SPE-type feature system which captures the generalizations necessary and (hopefully) makes the work accessible to as wide a readership as possible.

(3) Natural classes of surface consonants in proto-Guang

	f	s	p	t	č	k	kp	ʔ	m	n	ɲ	ŋ	b	d	j	l	r	y	w
BACK	-	-	-	-	-	+	+	-	-	-	-	+	-	-	-	-	-	-	+
CORONAL	-	+	-	+	+	-	-	-	-	+	+	-	-	+	+	+	+	-	-
LABIAL	+	-	+	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	-
HIGH	-	-	-	-	+	+	+	-	-	-	+	+	-	-	+	-	-	+	+
NASAL	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-
CONTINUANT	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
VOICE	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+
LATERAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-

The consonants reconstructed for PG appear in (4)-(6), together with evidence which supports their reconstruction. Numerals to the right of each sound correspond with the numbers of the appropriate cognate sets located in Appendix A.

(4) [-Continuant, -Nasal] consonants

- *p 52-57, 60
- *b 32, 58, 59, 61-63, 83, 85
- *t 3, 11, 17, 22, 23, 39, 63-67, 78, 69, 75, 81
- *d 25, 27, 70-72
- *č 33, 43-45
- *j 31, 46-48
- *k 20, 22, 24, 26, 49, 79-84
- *kp 10, 12, 21, 76-78, 87, 88
- *ʔ 1, 6, 8, 28, 45, 59, 65, 67, 71, 79

(5) [+Nasal] consonants

- *m 1-6, 15
- *n 7-14, 23, 40, 69, 75, 85, 86
- *ɲ 16-18, 43, 54
- *ŋ 7, 18-20, 22, 24-27, 72, 80, 83

(6) [+Continuant] consonants

- *f 28-32, 50, 86
- *s 15, 21, 24, 40-42, 51, 75
- *l 20, 29, 32, 35-37, 49-51, 55-57, 60, 62, 80
- *r 6, 66, 73, 74, 77, 79
- *y 34, 35, 74
- *w 37-39, 73

1.2 DISTRIBUTION

Compared with some languages (e.g. Fulfulde), there is not a lot 'going on' in the Guang languages with regard to consonant alternations and distributions. In all the Guang languages, the realizations of most consonants are usually invariable, and this also holds for what is reconstructable for PG. Note, however, the following facts for PG.

(a) Only nasal consonants or glottal stops occur syllable finally.

(b) Syllable-final nasal consonants have the place of articulation of a following consonant (see cognate sets 22-24, 40, 43, 69, 72, 75, 80, 83, 87). Elsewhere, i.e. before a vowel, or utterance finally, they are realized with the velar articulation [ŋ] (see cognate sets 7, 18, 25-27, 80).

(c) *[d] never occurs intervocally in root-medial environments (see cognate sets 25, 27, 70-72). *[r] never occurs in root or word-initial environments, or before nasal vowels (see cognate sets 6, 66, 73, 74, 77, 79). From this I propose that proto-Guang had a synchronic rule whereby in root-medial intervocalic environments */d/ was realized as *[n] before nasal vowels, and *[r] elsewhere. In root-initial position and in root-medial position following a nasal coda */d/ was realized as *[d].

(d) *y and *w never occur in root-medial environments.

(e) The glottal stop only occurs utterance finally.

2. HISTORICAL DEVELOPMENTS

Since the period of the latest common ancestor of the Guang languages, a number of innovations have taken place with regard to the consonant system. Rather than trace the history of each PG sound as an isolate, I focus instead on the changes as they have affected various natural classes, in order to capture, more readily, significant generalizations. These generalizations are discussed below and then stated formally in the list of historical innovations in Appendix B.

2.1 PALATALIZATION BEFORE i

In a number of Guang languages, the set of PG [+Coronal, -Continuant] consonants has become [+High] when followed by the vowel i. The specific manner in which this innovation is realized in the various groups is set out in (7). Numerals to the right of each innovation signify the cognate sets in Appendix A which support the proposed innovation.

(7) Palatalization before i

PG*n	>	ɲ	(North Guang) 13, 14, 23
PG*t	>	č	(North Guang), ts (Hill Guang) 11
PG*d	>	j	(North Guang, Hill Guang) 70
PG*b	>	j	(River Guang, Awutu) 61-63
PHG*k	>	č	(Larteh) 22, 24, 82-84

Counterexamples to some of the above innovations do exist, however. For instance, the proposed innovation PG*n > PNG*ɲ can be contested on the grounds of examples like those in cognate sets 10 and 11. In these examples PG*nī is not realized in the North Guang languages as [ɲī], but rather as [nī]. Note, however, that in both of these examples the [i] occurs in the second syllable of the root. I suggest that in underlying forms only the vowel of the first syllable is inherently [+ATR] in [+ATR] roots. Thus at some subsequent stage, synchronically, the [+ATR] value of the first vowel spreads rightward to the second vowel. If this is so, a reasonable explanation can be offered for

the failure of the **n** to ‘palatalize’ in this environment in that the following vowel is not the [+ATR] /i/, but rather /ɨ/, or perhaps an underspecified /I/, depending on one’s theoretical persuasion.² Not all counterexamples are accounted for so readily, however, Cognate set 65, for instance, appears to provide a clear counterexample to the proposed innovation PG*t > PNG*č, PHG*ts.³

All the sounds undergoing change discussed so far in this section can reasonably be argued to involve the same underlying process. The next two, however, PG*b > j in River Guang and Awutu, and PG*k > č in Larteh, while similar, reflect different underlying processes. First, the sounds discussed so far were all [+Coronal] prior to the innovation, whereas the latter two were [+Labial] and [+Back], respectively. Secondly, the conditioning environments of the latter two differ from the first set; the first set of innovations was conditioned solely by the presence of a [+ATR] i, the latter two were conditioned by either i or ɨ. The innovation PG*k > č seems to have occurred perhaps only stem-medially. Since for this latter case all of the supporting examples probably involve the same morpheme, it is difficult to say what the conditioning environment really was. On the other hand, it does not seem to have occurred in all environments where the PG sequence *ki or *kɨ occurred (See cognate set 81 for a counterexample).

The PG*b > j innovation seems to have occurred whenever the PG sequence *bi or *bɨ occurred, however there is some irregularity which needs to be pointed out. Stewart (personal communication) has drawn my attention to certain exceptions to this proposed innovation which appear in the data of my sources (i.e. Snider 1989a and Stewart 1966). These examples include cases in which the languages in question have bi in forms which are cognate with bi in the other Guang languages. Clear examples of this appear in (8a).

(8a)	‘be black’	‘to ask for’
Chumburung	biri	bise
Krachi	b̄iri	bise
Awutu	biri	bisa
Twi	biri	bisa
(8b)	‘faeces’	‘black’
Chumburung	i-jinī	jiji?
Krachi	n-səbi	bibi?
Awutu	e-bijn	e-bibi

Prior to receiving Stewart’s comments, I did not consider examples such as those in (8a) to be exceptions since I discounted them as relatively recent borrowings from Twi. Stewart plausibly suggests, however, that in those examples in which all three of the languages proposed to have undergone the innovation have j, the j does not originate from PG*b, but rather from some other consonant (he suggests perhaps PG*gw, which I have not reconstructed). He also notes the examples in (8b) in which only Chumburung appears to have undergone the innovation. For these examples he suggests that the PG form was *b and that the Chumburung examples are cases of hypercorrection, perhaps. While I am unable to confirm Stewart’s suggestions with the data at my disposal, the

² Stewart (personal communication) suggests the following scenario to explain the failure of *n to palatalize in these counterexamples. The PG forms for these words could have included r’s or l’s which were nasalized when they preceded nasal vowels. This, of course, assumes that r’s and l’s did not palatalize before i, an assumption which seems to be true.

³ Stewart (personal communication) offers the suggestion that t’s which do not undergo palatalization in this environment could have their source in proto-Tano *θ which derived from proto-Volta Congo fortis *d.

problems he raises cast serious doubt on the validity of the innovation as it stands. I therefore leave the matter open for the moment with the hope that by publishing the problem as unsolved it will attract attention from other scholars who can shed more light on it.

2.2 INNOVATIONS AFFECTING VOICELESS MEDIAL STOPS

In stem-medial environments there is a process whereby consonants which are [-Continuant, -Voice] become [+Voice] in the Mountain Guang languages. Consider the innovations in (9).

(9) Voicing in stem-medial environments

POG*p	>	b	(Gichode) 52, 53, 54, 60, 62
POG*t	>	d	(Gichode) 23, 28, 39, 63, 75, 81
POG*k	>	g	(Mountain Guang) 20, 22, 24, 82, 83, 84
POG*kp	>	gb(?)	(Mountain Guang) No examples

In Gichode, all voiceless stem-medial stops which have been inherited from PG are regularly voiced; however in Nawuri, the other Mountain Guang language included in this study, only velar *k* has (yet) undergone this innovation. The labial-velar stop *kp* seems not to have occurred often in proto-Guang and it has not been possible to reconstruct any stem-medial examples of the sound. This is unfortunate since, while we can probably assume that its stem-medial reflex in Gichode was voiced, it would be interesting to know whether or not its stem-medial reflex in Nawuri would also be voiced (given that velar *k* is voiced in this environment). I leave the solution of this mystery also to the future.⁴

Not only has voicing occurred in stem-medial environments, but it has also occurred to the *k* of the noun class prefixes POG*kI- and POG*KE- in both Gichode and Nawuri (see cognate sets 28, 45, and 54). Since *k* is the only voiceless stop which begins prefixes, it is impossible to tell whether other stops would also have been voiced in this environment in Gichode. Inasmuch as other stops are not voiced stem-medially in Nawuri, I assume that they would not have been voiced had they occurred in prefix-initial environments in Nawuri.

Voiceless stops which occurred in stem-initial environments, though often intervocalic, did not become voiced in either Nawuri or Gichode. Compare the forms in (9) with those in (10) in which the voiceless stops occur in stem-initial environments.

(10) Nonvoicing of stops in stem-initial environments

POG*p	>	p	52, 53, 55, 56, 57
POG*t	>	t	64, 65, 66, 67, 68, 69

⁴ Stewart (personal communication) argues that the *g* in Mountain Guang languages is a retention, and that the non-Mountain Guang languages have innovated by devoicing the *g*, a common innovation. I do not believe this to be the case for the following reasons:

- While devoicing *g* might be natural enough in the prefix-initial environment, it is definitely unnatural in the intervocalic environment where one would expect the direction of change to be voiceless to voiced.
- If the occurrence of *g* in MG languages is a retention, then for all the other Guang languages to have undergone devoicing in this environment would have involved the same innovation having occurred independently several times. Given the unnaturalness of the innovation in intervocalic environments, for it to have occurred several times independently would be unlikely.
- It ignores the parallel development in which PMG*t and *p are realized as *d* and *b*, respectively, in non-stem initial environments in Gichode.

POG*k > k 26, 49, 79, 80, 81, 82
 POG*kp > kp 12, 21, 76, 77, 87, 88

While the examples in (10) make it clear that stem-initial environments did not undergo the voicing innovation, there are counterexamples to those which support the retention of voiceless **kp**. In cognate sets 10 and 78, the Gichode and Nawuri forms are realized with initial **gb**. That the voicing of these forms is due to the innovation presently under consideration, however, is doubtful since: a) the forms in (10), immediately above, would be counterexamples to such a claim, and b) the Gonja cognates are also voiced in these examples which suggests that the voicing is due to other reasons (e.g. borrowing from Gonja, etc.).

The question arises at this point as to the source of Gonja's **gb**. The Gonja **gb** appears to be cognate with **kp** in the other Guang languages (cf. cognate sets 10, 12, 21, 78). However, Gonja also has **kp**'s which are cognate with the **kp**'s of other Guang languages (cf. 77, 87, 88). One possibility is that the Gonja **gb** is a retention from a PG***gb**, and that PG***gb** merged with PG***kp** in the other Guang languages. While this is a possibility, without access to sufficient non-Guang Tano data, it is impossible to do more than speculate. In the absence of better evidence for a PG***gb**, I have chosen the more conservative route and reconstructed only those elements of PG which I am convinced existed. Hopefully future comparative investigation of other Tano languages will shed more light on this matter.

The motivation for the voicing of prefix-initial and stem-medial stops in MG is not clear. Intervocalic voicing is not surprising since one can say that the stops are assimilating to the [+Voice] feature of the surrounding vowels. This does not seem to be the case, however; stem-initial occurrences which are preceded by a prefix (thus making them intervocalic) are not voiced. Also the voicing in prefix-initial environments would argue against this assumption. The voicing can also not be attributed to some sort of strengthening in initial environments since, apart from prefix-initial environments, the voicing occurs medially.

One possibility is a rule whereby voiceless stops became voiced in all environments except stem-initial. Stewart (personal communication) has kindly drawn my attention to footnote 4 of Clark (to appear). Clark, agreeing with Hyman (1985), notes that 'there are postlexical rules in Dschang which are sensitive to the boundary between the prefix and the stem' and attributes this to 'the fact that the first syllable of the stem has a special phonological property - stress - which distinguishes it from other syllable(s)'. Clearly something of this nature must hold true for the Guang languages given the failure of C₁ to undergo a number of the innovations applicable to C₂ which are described in the present work.

2.3 INNOVATIONS AFFECTING POSTCODA STOPS

I have already stated that the nasal coda assimilates to the place of articulation of a following consonant. Not only does this happen but in certain cases the following consonant also assimilates to the preceding nasal coda. The cognate sets listed in (11) illustrate the historical innovations I propose.

- (11) Assimilation of postcoda stops to preceding nasal
- | | | | |
|-------------------------|---|-----------|--------------------------|
| PG* ŋk | > | ŋŋ | (North Guang) 22, 24, 83 |
| POG* nt | > | nn | (Chumburung) 18, 23 |
| (However) PG* mp | > | mp | (All) 89 |

I have not been able to reconstruct many word-medial occurrences of CC, but those which I have been able to reconstruct suggest that: a) PG**p* did not assimilate in any language to a preceding nasal coda, b) PG**t* assimilated to a preceding coda only in Chumburung (a North Guang language), and c) PG**k* assimilated to a preceding coda in the North Guang subgroup. There are two exceptions to this last generalization, however: Nkonya and Gichode.

Nkonya appears to have retained the original **k* in this environment, as did the South Guang languages. I suggest, however, for the following reasons, that Nkonya borrowed this characteristic from the South Guang languages. If PNG truly underwent the innovation, it would then be required that Nkonya would have independently reversed the direction of the change which, while perhaps possible, is not probable. Nkonya, though North Guang, can be demonstrated to have borrowed other aspects from the South Guang languages (cf. Snider 1988 and forthcoming) which suggests that Nkonya may also have borrowed this aspect.

In Gichode, the *k* of PG**ɲk* sequences went to *g* (as did all other stem-medial *g*'s). If, as I postulate, the innovation of PG**ɲk* > PNG**ɲɲ* occurred during the time of proto-North Guang, the question arises as to why Gichode forms would undergo PMG**ɲɲ* > *ɲg* since the stem-medial voicing of consonants which Gichode underwent does not seem to otherwise have affected instances of [ɲ].

I propose the following solution to this problem. The general innovation of NC to NN, though clearly a historical rule, was a synchronic rule, at least until the time Gichode split off from Nawuri. Mountain Guang speakers therefore had a synchronic rule /*k*/ --> [ɲ] / ɲ —. Later, when (or perhaps after, since Nawuri did not follow Gichode in this respect) the more recent rule POG**k* > PMG**g* came into being, the underlying *k*'s of the /*ɲk*/ sequences were realized as [ɲg] instead of the former [ɲɲ].

2.4 STEM-MEDIAL INTERVOCALIC WEAKENING

Another process which can be seen to have affected Guang consonants is that of stem-medial intervocalic weakening. As a general process it has not affected all languages in the same way; e.g. while the innovation PG**ɹ* > *r* can be demonstrated to have occurred not only in the development of proto-South Guang, but also in the development of proto-River Guang. The innovation PRG**t* > *r*, on the other hand, seems to have been confined to the development of only Chumburung. The way this process has manifested itself is set forth in (12).

- (12) Stem-medial intervocalic weakening
- | | |
|----------------|---|
| PG* <i>k</i> > | <i>w</i> (NG) 20, 82, 84 |
| PG* <i>ɹ</i> > | <i>r</i> (SG, RG) 29, 35, 37, 49-51, 57, 62 |
| PG* <i>t</i> > | <i>r</i> (Chumburung) 3, 17, 28, 39, 63, 81 |

In the case of PG**k* > *w* (North Guang), the examples show that instead of the expected cognate *w*, the Mountain Guang languages have innovated with *g*. Since by the time proto-Mountain Guang would have been developing its distinctive characteristics, the medial *k*'s should all have been changed to *w* long before, the question arises as to how the MG speakers would know that these *w*'s used to be *k*'s so that they could change them to *g*'s in accordance with their more general rule whereby stops became voiced in this environment. I explain this in the same way that I explain the occurrence of [ɲg] instead of [ɲɲ] for the MG group in sec. 2.3, immediately above. I assume that the historical innovation PG**k* > *w* was a synchronic rule at least until the time that the MG languages split off from proto-Oti-Guang. Thus the rule /*k*/ —> [w] was suspended

when the MG voicing rule discussed in sec. 2.2. above, changed all underlying stem-medial *k*'s to *g*'s.

In the case of Krachi, two of the three examples in (12) which support the innovation PG**k* > *w* show that Krachi has *k* instead of *w* and I am unable to offer an explanation for this. I simply note it for future investigation.

The innovation PG**l* > *r* took place, independently it would seem, in two separate subgroups: South Guang and River Guang. In the SG subgroup we find medial *l*'s consistently realized as *r*'s except in Gwa. In Gwa, we find only *l*'s. I do not believe that the *l*'s in Gwa are a retention, however. As discussed below, Gwa had a (later) rule whereby all proto **r*'s became *l*'s, including, I argue, those which had earlier come from PG**l*.

While superficially, the River Guang subgroup appears to have undergone the medial PG**l* > *r* innovation in a straightforward manner, there is some alternation in Chumburung worthy of mention. In Snider 1984, I attempt to demonstrate that stem-medially, *l* does occur in Chumburung, but only when the preceding consonant is itself *l* and when the intervening vowel is from the [+ATR] set. Thus one finds Chumburung words like *læle* 'cattle egret'.

During the period when Chumburung was undergoing its development from proto-River Guang, the innovation PG**t* > *r* took place in stem-medial intervocalic environments. This seems to have been a clear-cut innovation and I have not found any exceptions to it.

2.5 LOSS OF WORD-FINAL NASAL CODAS

In the South Guang languages, the final nasal consonant in proto-Guang sequences of **VN* has dropped off and transferred its nasal quality to the preceding vowel. It seems that this same innovation has also taken place in Nkonya, most likely as a borrowing due to close interaction with South Guang groups. Evidence for this innovation is in (13).

(13) Loss of word-final nasal codas

PG**VN* > \tilde{V} (SG, Nkonya) 7, 18, 25-27

The question of why the innovation is assumed to be from PG oral vowel followed by nasal coda to SG nasal vowel, rather than from PG nasal vowel to NG oral vowel followed by nasal coda, is discussed in Snider (1989b). There it is argued that had the innovation been from PG word-final nasal vowel to NG oral vowel followed by nasal coda, the innovation should have applied to all PG words which ended in a nasal vowel. Since this clearly did not happen (cf. Snider 1989b), the most plausible reconstruction is that presently put forward.

2.6 MISCELLANEOUS INNOVATIONS

Since the remaining proposed innovations do not involve more than one sound each, I have combined discussion of them into one section.

I have no evidence for medial occurrences of **y* or **w* in PG. I am also unable to reconstruct instances of **w* before front vowels and it is therefore tempting to conclude that **y* and **w* were in complementary distribution, with **y* occurring before nonround vowels and **w* occurring before round vowels. There is, however, contrast in the case of **y* which appears to have been realized in PG before both sets of vowels (cf. cognate sets 34 and 35). While **y* and **w* probably contrasted before round vowels in PG, this

contrast seems to have disappeared during the development of proto-South Guang. In the South Guang reflexes of proto-Guang, we see only *w* occurring before round vowels.⁵ Although only minimal evidence exists, what there is suggests that PG*y became *w* before round vowels in South Guang.

(14) PG*y > w / — V (SG) 35, 74
[+Rd]

In the Coastal Guang languages, evidence (again minimal) suggests that in proto-South Guang sequences of *w* followed by a round vowel and *r*, the vowel became unrounded and the back round [w] became a front round [w].

(15) PSG*w V r > ̥ V r (CG) 35, 37, 74
[+Rd] [-Rd]

The reflexes of PG*p provide additional support for the proto-South Guang subgroup where we see that *p has become *h*. This innovation was first recognized by Stewart (personal communication). This is not to say that South Guang languages do not have *p*'s, however. In (19), below, we see *p*'s in the Coastal Guang subgroup of South Guang which have developed from PSG*kp.

(16) PG*p > h (South Guang) 52-57, 60, 62

In the case of the Efutu reflexes of PG*p, the minimal data I have at my disposal indicates that PCG*h went to *w* before round vowels.⁶ Unfortunately, due to the scarcity of Efutu data, I have no examples of Efutu reflexes of PG*p which occur before nonround vowels. In the absence of contrastive data, the proposed innovation in (17) is therefore made very hesitantly.

(17) PCH*h > w / — V (Efutu) 52, 54
[+Rd]

In some of the languages PG*č has undergone depalatalization. The innovations seem to have occurred independently of each other however, as evidenced by the disparity of the languages involved - one from North Guang, one from *Hill Guang, and one from Coastal Guang.

(18) Depalatalization of PG*č

PG*č > ts (Nkonya) 33, 43-45
> s (Efutu)
> ts / — V (Larteh)
|-Front|
|-High|

In Larteh, the evidence suggests that depalatalization did not occur before high, front vowels (e.g. čnē 'to sit', cognate set 44).

⁵ We should not be too hasty in drawing conclusions about the synchronic situation of the South Guang languages today. While [y] and [w] do not appear to contrast in those words which have been inherited from PG, this does not mean that they do not contrast in other words which have crept into the languages in more recent times (i.e., the diachronic rule changing *y to *w* before round vowels may not be part of today's synchronic descriptions).

⁶ Larteh reflexes of PG*-pə, PSG*-hə 'person' are also realized with a [w]. Since PSG*h is not otherwise realized as [w] before round vowels in Larteh (e.g. ə-hə 'breast', cf. cognate set 54), it has clearly not undergone the same innovation that Efutu has. The explanation for this reflex therefore remains unclear to me.

During the development of proto-Coastal Guang, there was the clear innovation of (19).⁷

(19) PSG***kp** > **p** (Coastal Guang) 21, 76, 87, 88

In both Gonja and Awutu there are examples of **š** which are reflexes of PG*s (cf. cognate sets 15 and 51 with 21, 40-42). The instances of **š** in Gonja are not cognate with those in Awutu, and neither set appears to be in an environment phonologically conducive to palatalization. Palatalization of **s** in both languages seems to involve free variation. For Gonja this is supported by Painter (1970:38-39), who describes /s/ in Gonja as being realized with either the [s] or [š] allophone. Although he notes a tendency for some speakers to use the palatal variant before front vowels, he describes other speakers who tend to use the palatal variant 'intermittently before all vowels.' Consider the following examples where we find [š] occurring before most any vowel in Gonja (20), and before most any vowel in Awutu (21).

(20)	'to cry'	'to run'	'to hang'
PG	*su	*sulV	*sVʔ
Gonja	šu	šule	šaʔ
Chumburung	su		s ^w aʔ
Larteh	sū	surt	sɛ
Awutu	sū	sre	
(21)	'set trap'	'to carve'	'to slip'
PG	*sVʔ	*sVIV	*sVtV
Gonja	soʔ	sulʔ	
Chumburung	s ^w lʔ	seri	sei
Larteh	so	sire	sĩtrã
Awutu	šš	šire	šatri

Throughout the Guang languages one finds rounded consonants which contrast in identical and analagous environments with their nonrounded counterparts. In spite of this, it has not been possible to reconstruct a set of rounded consonants for proto-Guang. Snider (1989b) attempts to show that the root-final round vowels are sporadically derounded in a number of languages. Contrast provided by the feature [Round] is nevertheless maintained in these cases as the preceding consonant is then pronounced with a rounded quality. Examples of this may be found in cognate sets 47, 52 and 79.

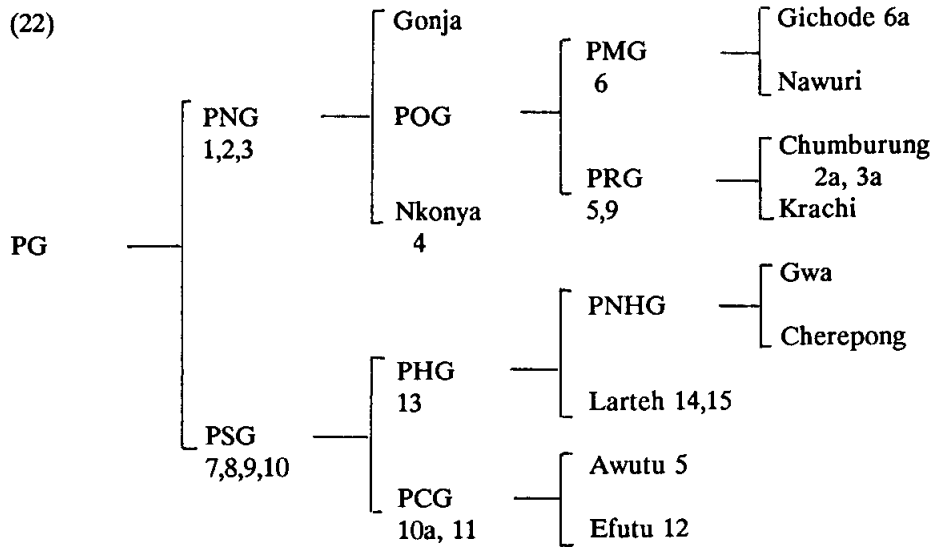
One final innovation concerns cognate set 19. I have tentatively reconstructed the PG form as *ku-ŋū 'head.' If this is correct, then we see a Coastal Guang innovation of root-initial (perhaps) PSG*ŋ > n. It would then appear that proto-North Guang innovated with PG*ŋ > m. Such a history then raises the problem of Chumburung which would seem to have retained the original *ŋ somehow. Again, the whole scenario is contradicted by cognate set 20, where PG*ŋ seems to have undergone little innovation, at least in North Guang. Since there is very little data to go on, I am unable to make a clear statement on this issue and I leave the matter for future investigation.

3. CONCLUSIONS

The historical picture that emerges from this study reveals a number of linguistic innovations which have occurred since the time of proto-Guang. These are set forth

⁷ Cognate set 78 could be taken as indicative that Larteh has also undergone an innovation ***kp** > **p**. We must be careful in interpreting the information in this example, however, since a number of the languages have reflexes with **gb**, thereby indicating that the proto-form may have included something other than PG***kp**.

graphically in (22) in a manner that shows which linguistic subgroups have undergone which innovations. The numeral below each name corresponds to the numbers of the proposed Historical Changes listed in Appendix B.



Perhaps the most important conclusion to be drawn from these reconstructions relates to the validity of the North Guang subgroup. Even though the genetic unity of this group has been assumed for some time (cf. Painter 1967), hard evidence demonstrating its unity, based on the principle of shared innovations, has been elusive: Stewart (1970) proposes only one innovation which supports it, i.e. the loss of nasality by nasal vowels which follow oral consonants. In a reconstruction of the PG noun class system (Snider 1988) I find no evidence to support it, and my reconstruction of the PG vowel system (Snider 1989b) is unable to do more to support it than confirm Stewart's (1970) claim.

Until the present, then, the validity of the North Guang subgroup has rested upon only a single innovation, i.e. that first proposed by Stewart (1970). In (22) we find three additional innovations which support the genetic unity of the North Guang subgroup. This brings to four the innovations which support this subgroup and makes the claim to its validity a great deal stronger.

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APPENDIX A: COGNATE SETS

	1. 'to kill'	2. 'to swallow'	3. 'to stick'
PG	*mɔ̃?	*mVCV	*mɛ̃tã
Gonja	mɔ̃?	mɪn?	
Chumburung	mɔ̃?	mɛ̃?	mɛ̃ra
Krachi	mɔ̃:?	mɛ̃?	mɛ̃ta
Gichode	mɔ̃:?	mãra:?	
Nawuri	mɔ̃:?	mɛ̃:?	
Nkonya	mɔ̃	mɛ̃	
Larteh	mɔ̃	mɛ̃	mɪtɛ̃
Cherepong	mɔ̃?		
Gwa	mɔ̃?	mɪ (P)	
Awutu	mɔ̃	mɛ̃	
Efutu	mɔ̃m	mɪn (FG)	
	4. 'belly'	5. 'nasal mucus'	6. 'latex/birdlime'
PG	*kʌ-mɛ̃	*ɪ-mɛ̃?	*kɪ-mãra?
Gonja		kɪ-mɛ̃le	a-mãr?
Chumburung	kə-mɛ̃	i-mɛ̃?	kɪ-mã?
Krachi	kʌ-mɛ̃	ɪ-mɛ̃?	kɪ-mã?
Gichode		ɪ-mɛ̃laj	gɪ-mãra:?
Nawuri		ɪ-mɛ̃:?	gɪ-mã:?
Nkonya			ɪ-mã
Larteh	a-mɛ̃		∅-mɛ̃
Cherepong	a-mɛ̃		
Gwa	a-mɛ̃		
Awutu		e-mɛ̃	a-mã
	7. 'to drink'	8. 'to walk'	9. 'mouth'
PG	*nũŋ	*nã?	*kɔ-nɔ̃
Gonja	nũ?	nɪ-tɛ?	kɔ-nɔ̃
Chumburung	nũ?	nã-ri	ka-nɔ̃
Krachi	nũ:?	nɛ̃-tɪ	kɔ-nɔ̃
Gichode	nũŋ	nã:?	gɔ-nɔ̃
Nawuri	nũ:?		gɔ-nɔ̃
Nkonya	nũ	nã-tɪ	ɔ-nɔ̃
Larteh	nũ	nã	a-nɔ̃ (SN)
Cherepong	nũ:?	nã?	a-nɔ̃
Gwa	nũ:	nã?	a-nɔ̃
Awutu	nũ	nã	a-nɔ̃
Efutu	nũ:	nã	a-nɔ̃

	10. 'okro'	11. 'vein'	12. 'be tired'
PG	*kə-kpunɪ	*o-tʃɪnɪ	*kpVnV
Gonja	kə-gbunɪ	ki-č+n?	gben?
Chumburung	kə-kpunɪ?	kɪ-čɪnɪ	kponɪ
Krachi	kə-kpunɪ?	kɪ-čɪnɪ	kponɪ
Gichode	gə-gbinɪ	o-čɪŋ	
Nawuri	gə-gbinɪ	o-čɪnɪ	kpɪnɛɪ
Nkonya		e-tsɪ	
Larteh	a-kponɪ	n-tsɪnɪ	kpɛnɛ
Awutu		n-tɪnɪ	
	13. 'to know'	14. 'mother'	15. 'to laugh'
PG	*nɪ	*o-nɪ	*mVsV
Gonja	nɪ	e-nɪɔ̃	mɔ̃ʃɛ
Chumburung	nɪ	∅-nɪ	mɔ̃sɪ
Krachi	nɪ (ST)	o-nɪ	mɔ̃sɪ
Gichode	nɪ	o-nɪ	ŋmãse
Nawuri	nɪ	o-nɪ	ŋmãseɪ
Nkonya	nɪ	o-nɪ	mɔ̃sɪ
Larteh	nɪ	o-nɪ	mãsi
Cherepong	nɪ		
Gwa	nɪ	∅-ni (P)	
Awutu	nɪ	∅-nɪ	mɔ̃se
Efutu	nɪ		
	16. 'two'	17. 'to spoil'	18. 'to wring out'
PG	*a-nɔ̃	*nVta	*nʌŋ
Gonja	a-nɔ̃		nʌn-to
Chumburung	a-nɔ̃	nɪra	nɔ̃n-nɔ̃
Krachi	a-nɔ̃	nɪte	nʌ (ST)
Gichode	ɪ-nɔ̃	nɪda	nʌŋ
Nawuri	a-nɔ̃	nɪ:ta	nʌŋ
Nkonya	a-nɔ̃	nɪnta	
Larteh	∅-nɔ̃	nɛnte	nã
Cherepong	∅-nɔ̃		
Gwa	∅-nɔ̃		
Awutu	e-nɔ̃	nãntã	
Efutu	n-nɔ̃		

	19. 'head'	20. 'to melt'	21. 'to lean'
PG	*ku-nŋ	*ŋɔ̃lɔ̃-ki	*kpasa
Gonja	ku-mŋ	ŋɛli-ga	gbasa
Chumburung	ku-nŋ	ŋtra-wi	kpise
Krachi	ku-mŋ	ŋtre-ki (ST)	kpise
Gichode	gu-mŋ		kpasa
Nawuri	gu-mŋ	ŋala-geɪ	kpasa
Nkonya	e-nwŋ	ŋlɔ̃	kpisa
Larteh	∅-nwŋ	nɔ̃	kpɔse
Cherepong	∅-nwŋ		
Gwa	∅-nwŋ		
Awutu	e-nŋ	ŋlɔ̃ke	pasa
Efutu	∅-nŋɔ̃		
	22. 'to wake up'	23. 'to lick'	24. 'to unbind'
PG	*tɛŋ-kɪ	*nɪn-ta	*saŋ-ki
Gonja	tɪŋ-ŋɪ	din-ti	saŋ-ŋɛ
Chumburung	ɔ̃tɛŋ-ŋɪ	ŋɛn-nɪ	saŋ-ŋɪ
Krachi	ɔ̃tɛŋ-ŋɪ	ŋɔ̃ -ti	saŋ-ŋɪ
Gichode	ɔ̃tɛŋ-gi	nɪn-de	saŋ-ge
Nawuri	ɔ̃tɛŋ-ŋɪ	ŋɪn-ta	saŋ-ŋɛɪ
Nkonya	tsiŋ-ki	ŋɪn-ta	saŋ-ki
Larteh	tsɪŋ-ɔ̃ɪ	nɪn-tɛ	sɔ̃ŋ-ɔ̃ɪ
Awutu	ʂɪŋ-kɪ	din-ta	sɔ̃ŋ-ke
	25. 'to bite'	26. 'hunger'	27. 'to grow'
PG	*dɔŋ	*a-kVŋ	*dɔŋ
Gonja	dɔŋ	a-kɔŋ	dɔŋ
Chumburung	dɔŋ	a-kɔŋ	dɔŋ
Krachi	dɔŋ	a-kɔŋ	dɔŋ
Gichode	dɔŋ	a-kɔŋ	sɔŋ
Nawuri	dɔŋ	a-kɔŋ	dɔŋ
Nkonya	dŋ	a-kɔ̃	dɔ̃
Larteh	dŋ	a-kɔ	de
Cherepong	dɪ	a-kɔ̃	
Gwa	dɪ	o-ko (P)	
Awutu	dŋ	a-kɔ̃	da
Efutu	dŋ		

	28. 'leaf'	29. 'be white'	30. 'rope'
PG	*kɛ-fVtaʔ	*fuli	*ɔ-fɛ
Gonja	kɛ-fantaŋ	fuli	
Chumburung	kɛ-firaʔ	fʷiri	∅-fɛ
Krachi	kɛ-fitaʔ	fufuri	ɔ-fɛ
Gichode	ɡɛ-fada:ʔ	fu:li	ɔ-fɛ
Nawuri	ɡɛ-fatsɛ:ʔ	fuli	ɔ-fɛ
Nkonya	ɪ-fita	fuli	ɔ-fɛ
Larteh	∅-fita-bi		∅-fɛ-bi
Cherepong	e-fite-bi		
Gwa		fuli	
Awutu	a-fata	furi	∅-fɛ-bi
Efutu	a-fita	firi	
	31. 'bark'	32. 'to urinate'	33. 'to cure'
PG	*kɛ-jafɔ	*bulufɔ	*ɕV
Gonja	kɛ-jafɔ	bɔŋfɔlʔ	ɕɛ
Chumburung	kɛ-jafɔ	burufɔ	ɕa
Krachi	kɛ-jafɔ	burufɔ:ʔ	ɕɛ
Gichode	a-jafʷɛɪ	bulufɔ	ɕɛ
Nawuri	ɡɛ-jafʷɛɪ	bulufɔ	ɕɛ
Nkonya	a- fʷɪ	blufɔ	tʂa
Larteh	o- firɪ	bufurɛ	tʂɛ
Cherepong	o- fitɪ		
Gwa	a-yifɔli		
Awutu	e- fle	brufo	ɕa
	34. 'tree'	35. 'be cold'	36. 'sore'
PG	*o-yi	*yuli	*ɔ-lɔ
Gonja			ɛ-lɔ
Chumburung	ki-yiʔ	yuri	∅-lɔ
Krachi	o-yu	yuri	ɔ-lɔ
Gichode	o-yi:ʔ	yu:li	ɔ-lɔ
Nawuri	o-yu	yuli	ɔ-lɔ
Nkonya	o-yi		ɔ-lɔ
Larteh	o-yi	wuri	o-lo
Cherepong	e-yi	wuri	
Gwa	a-yi	wuli (P67)	
Awutu	e-yi	wiri	e-lɔ
Efutu	∅-yi-bi	wir	

	37. 'skin'	38. 'to die'	39. 'to pound'
PG	*ɔ-wɔlɔ	*wu	*wɔtɪ
Gonja	ka-wɔlʔ	wu	
Chumburung	∅-wɔrɪ	wu	wɔrɪ
Krachi	ɔ-wɔrɪ	wu	wɔtɪ
Gichode	ɔ-wɔlɛ	wu	wɔdɛ
Nawuri	ɔ-wɔlɛɪ	wu	wɔtɛɪ
Nkonya	ɔ-wɔlɔ	wu	wɔ
Larteh	o-wurɪ (SN)	wu	wɔ
Cherepong	∅-wɪrɪ	wu	
Gwa	ɔ-wɔlɪ	wu	
Awutu	e-were	wu	
Efutu	i-wire	wu	

	40. 'ash'	41. 'ear'	42. 'three'
PG	*n-sɔ̃	*kɔ-sɔ	*a-sã
Gonja	n-sɔ	kɔ-sɔ	a-sa
Chumburung	n-sɔ		a-sa
Krachi	n-sɔ	kɔ-sɔ	a-sa
Gichode	n-sɔ	gɔ-sɔ	ɪ-sa
Nawuri	n-sɔ	gɔ-sɔ	a-sa
Nkonya	n-suo	ɪ-sɔ (SN)	a-sa
Larteh	n-sɔ̃	∅-sɔ	∅-sã
Cherepong	n-sɔ̃	ɛ-sɔ	ɛ-sã (R)
Gwa	n-sɔ̃	ɔ-sɔ	ɪ-sã (P)
Awutu	n-sɔ̃	ə-sɔ (SN)	e-sã
Efutu	n-sɔ̃	a-su-bi (FG)	ɪ-sã (FG)

	43. 'water'	44. 'to sit'	45. 'dance'
PG	*ɲ-ɕu	*ɕɪnã	*kɒ-ɕaʔ
Gonja	ɲ-ɕu	ɕɪnã	ka-ɕaʔ
Chumburung	ɲ-ɕu	ɕɪnã	ka-ɕaʔ
Krachi	ɲ-ɕu	ɕɪrɛ	kɪ-ɕa:ʔ
Gichode	ɲ-ɕu	ɕɪnã	gɛ-ɕa:ʔ
Nawuri	ɲ-ɕu	ɕɪnã	ga-ɕa:ʔ
Nkonya	ɲ-tsu	tsia	ɪ-tsa
Larteh	ɲ-tsu	ɕɪnɛ̃	∅-tsa
Cherepong	ɲ-ɕu	ɕɪnɛ̃ɪ	
Gwa	ɲ-ɕu	ɕɪnɛ̃ɪ	
Awutu	ɲ-ɕu	ɕɪnã	a-ɕa
Efutu	n-su	sɪnã	

	46. 'yam'	47. 'to wait'	48. 'chase away'
PG	*ku-jo	*joʔ	*ja
Gonja	ku-jo	joʔ	ju
Chumburung	ku-jo	jʷiʔ	ja
Krachi	ku-jo	joʔ	je
Gichode	gu-jo	jo:ʔ	ja
Nawuri	gu-jo	jo:ʔ	ja
Nkonya	o-jo	jo	ja
Larteh	∅-jʷo	jo	je
Awutu	e-jo	jo	
	49. 'husband'	50. 'salt'	51. 'to carve'
PG	*o-kulu	*ŋ-fɔli	*sVlV
Gonja	e-kulʔ	ŋ-fɔlʔ	sɪlʔ
Chumburung	∅-kuri	ŋ-fɔri	seri
Krachi	o-kuri	ŋ-fɔri	sɛri
Gichode	o-kuli	ŋ-fɔlɛ	salɛ
Nawuri	o-kuli	ŋ-fɔlɛɪ	salɛɪ
Nkonya	o-kulu	ŋ-fɔli	sri
Larteh	o-kuru	ŋ-fra	sire
Awutu	∅-kuri		šire
	52. 'new'	53. 'red'	54. 'breast'
PG	*pVpV	*pVpV	*kɪ-nǎpɔ
Gonja	pɔpɔʔ	pɪpɪʔ	kɪ-nǎpɔ
Chumburung	pɔpʷɛʔ	pipeʔ	kɪ-nǎpɔ
Krachi	ɔ-pɔpʷɛ (ST)	pipeʔ	kɪ-nǎpɔ
Gichode	pɔbɔɔʔ	ɪ-pɪbɪrɔ:ʔ	gɪ-nǎbɔ
Nawuri	gɪ-pɔpʷɛ:ʔ	gɪ-pɛ:ʔ	gɪ-nǎpɔ
Nkonya	ɪ-pɔpʷɛ	ɪ-pɛpɛ	∅-nǎpɔ
Larteh	o-hwe	ɔ-hɛ	ɔ- hɔ
Cherepong	a-hʷɛʔ	a-hɪʔ	ɔ- hɔ
Gwa	a-hʷɪʔ		ɔ- hɔ
Awutu	e-hɔhɔ	e-hɛhɛ	o- hɔ (SN)
Efutu	ɔ-wɔ		ɔ- wɔ
	55. 'loan'	56. 'be wet'	57. 'to bury'
PG	*ka-pala	*pɔlɛ	*pula
Gonja	ka-paŋ	pɔ	puli
Chumburung	kɪ-para	pɔ	pure
Krachi	ka-para	pɔʔ	purɛ
Gichode		pale	pule
Nawuri	gɪ-pa:la	pɔ	pula
Nkonya	ɪ-pǎ		pula
Larteh	a-ha	hole	hurɛ
Awutu	a-ha	hole	

	58. 'to come'	59. 'be drunk'	60. 'weaver'
PG	*ba	*bV?	*ɔ-lɔ-pɔ
Gonja	ba	bɔ?	ɛ-lɔ-pɔ
Chumburung	ba	bʷɪ?	ɔ-lɔ-pɔ
Krachi	bɛ	bɔ?	ɔ-lɔ-pɔ
Gichode	ba	bɔ:?	ɔ-lɔ-bɔ
Nawuri	ba	bɔ:?	ɔ-lɔ-pɔ
Nkonya	ba	bɔ	ɔ-lɔ-pɔ
Larteh	bɛ	bɔ	ɔ-lɔ-wɔ
Cherepong	bɛ		
Gwa	bɛ		
Awutu	ba	bo	e-lo-ho
Efutu	ba		
	61. 'seed'	62. 'blacksmith'	63. 'to pull'
PG	*kɪ-bi	*ɔ-bili-pɔ	*biti
Chumburung	ki-ji		ji:ri
Krachi	ki-ji	ɔ-ji:ri-pɔ	ji:ti
Gichode	gɪ-bi	ɔ-bili-bɔ	bide
Nawuri	gɪ-bi		bitɛɪ
Nkonya	i-bi		biti
Larteh	e-bi	o-bire-wɔ	
Cherepong	e-bi		
Gwa	e-bi		
Awutu	a-bi	o-jere-ho	jʷete
Efutu	m-bi		
	64. 'to roast'	65. 'to plug'	66. 'to call'
PG	*tʃ	*ti?	*tiri
Gonja	tɔ	ti-so	tri
Chumburung	tɔ	ti?	ti:
Krachi	tɔ	tɛ:?	ti:
Gichode	tɔ	ti:?	tire
Nawuri	tɔ	ti:?	ti:?
Nkonya	tɔ	tɪ	ti
Larteh	tʃ	ti	tiri
Awutu		ti	tere
	67. 'feather'	68. 'thing'	69. 'alcoholic drink'
PG	*kɔ-tɔ?	*kɔ-tɔ	*n-tã
Gonja	ki-tɛ?	ku-sɔ	n-sa
Chumburung	ki-te?	ki-tɔ	n-ta
Krachi	ki-tɛ:?	ki-tɔ	n-tɛ
Gichode	gi-tʷɛ:?	a-tɔ	n-ta
Nawuri	gi-tʷɛ:?	gɔ-tɔ	n-ta
Nkonya	ɪ-tɛ	ɪ-tɔ	n-ta
Larteh	ɪ-tʃ	e-te	n-tɛ
Cherepong	ɪ-tɔ?		n-tɛ (P)
Gwa	ɪ-tɔ?		n-tã
Awutu	a-ta	a-tɔ	

	70. 'to eat'	71. 'tail'	72. 'to cook'
PG	*di	*o-dũ?	*daŋka
Gonja	ji	ka-du?	daŋŋɛ
Chumburung	ji		dɪŋŋǎ
Krachi	ji	o-du:?	deke
Gichode	ji	o-du:?	
Nawuri	ji		dɪŋŋǎ
Nkonya	ji	o-du	
Larteh	ji	o-dũ	daŋke
Cherepong	ji	ɛ-dũ?	
Gwa	ji	a-dũ?	
Awutu	di	e-dũ	dǎŋka
Efutu	di		
	73. 'chief'	74. 'to steal'	75. 'sheep'
PG	*o-wura	*yuri	*Ø-santi
Gonja	e-wura	yuri	
Chumburung	o-wure		Ø-sannĩ
Krachi	o-wurɛ (ST)		Ø-santi
Gichode	Ø-wura	yu:ri	Ø-sandɛ
Nawuri	o-wura	yu:ri	
Nkonya	o-wie		
Larteh	o-wurɛ	wuri	o-sente
Gwa	o-wule (P)		
Awutu		wiri	
	76. 'to fade'	77. 'to wipe off'	78. 'to belch'
PG	*kpa	*kpVrV	*kpV
Gonja		kpara	gbu
Chumburung	kpa	kpe	kpe:-si
Krachi	kpe	kpeɪ	gbe:-su:?
Gichode	kpa	kpa:rɛ	gbi:?
Nawuri	kpa-sɔ	kpeɪ	gbi:?
Nkonya	kpa	kpa	kpie
Larteh	kpe	kpiɪɪ	pie
Awutu	pa		
	79. 'to dig'	80. 'blood'	81. 'lizard'
PG	*kuru?	*ŋ-kalɔŋ	*Ø-kiti
Gonja	kur?	ŋ-kalɔŋ	Ø-kiti?
Chumburung	kʷi?		Ø-kəri
Krachi	kʷi?		Ø-kɪtɪ
Gichode	kuru:?	ŋ-kalɔŋ	Ø-kɪdɛɪ
Nawuri	ku:?	ŋ-kalɔŋ	Ø-kɪtɛɪ
Nkonya	kʷi		Ø-kɪtɪ
Larteh	ku	ŋ-kre	o-kiti
Awutu	ku	ŋ-kla	e-kiti
Efutu		ŋ-kra	

	82. 'to bear'	83. 'to open'	84. 'to unload'
PG	*kɔ-kɪ	*buŋ-ki	*sɔ-ki
Gonja	kɔɔ-wɪ	bu -wi	sɔ-wɪ
Chumburung	kɔ-wɪ	buŋ-ŋɪ	sɔ-wɪ
Krachi	kɔ-wɪ		sɔ-ki
Gichode	kɔɔ-gɛ	bu -gi	sɔ-gɛ
Nawuri	kɔ-gɛɪ	bu -gi	sɔ-gɛɪ
Nkonya	k-wɪ		sʷɪ:
Larteh	kɔ-čɪ	bu -či	sɔ-čɪ
Awutu	ko-ke	fɔŋ-kɪ	so-ke
	85. 'left'	86. 'how many'	87. 'life'
PG	*bVnV	*a-fVnV	*ŋm-kpǎ
Gonja	bɪnǎ	a-fɪnɛ	ŋ-kpa
Chumburung	bɪnǎ	a-fɪnɪ	ŋm-kpa
Krachi	bɪrɛ	a-fɪrɛ	ŋm-kpa
Gichode	bɪnɛ	ɪ-fɔnɛ	ŋm-kpa
Nawuri	bɪnǎ	a-fɪnɛ	ŋm-kpa
Nkonya	benǎ	a-fɪnɪ	ŋm-kpa
Larteh	benɪ	∅-fɛnɪ	ŋm-kpɛ
Awutu		e- nɛ	m- pǎ
	88. 'path'	89. 'talking drums'	
PG	*ɔ-kpa	*n-tumpanɪ	
Gonja	ɛ-kpa	n-tɪmpɛnɪ	
Chumburung	∅-kpa	n-tɪmpɛnɪ	
Krachi	ɔ-kpɛ	n-tɪmpənɪ	
Gichode	ɔ-kpa	n-tɪmpaŋ	
Nawuri	ɔ-kpa	n-tɪmpɛnɪ	
Nkonya	ɔ-kpa	a-tumpa	
Larteh	ɔ-kpɛ		
Cherepong	a-kpɛ		
Gwa	a-kpɛ		
Awutu	e-pa	a-tumpanɪ	
Efutu	∅-pa (FG)		

APPENDIX B: HISTORICAL INNOVATIONS

- *C > [+High] / __ i (PG > PNG)
 [-Cont.]
 [+Coronal]
 t, d, n
 č, j, ɲ
- *C > [+Nasal] / V C __ (PG > PNG)
 [-Labial]
 [-Continuant]
 [+Back]
 k
 ŋ [+Nasal]
- *C > [+Nasal] / V C __ (PRG > Chumburung)
 [-Continuant]
 [+Back]
 k, t
 ŋ, n [+Nasal]
- *C > [+Continuant] / V __ V stem-medial (PG > PNG)
 [-Labial]
 [-Nasal]
 [+Back]
 k
 w
- *C > [+Continuant] / V __ V stem-medial (PRG > Chumburung)
 [-Labial]
 [-Nasal]
 k, t
 w, r
- *C > [-High] (PNG > Nkonya)
 [+Del. Rel.]
 [+Coronal]
 [+High]
 č
 ts
- *C > [-Labial] / [+Coronal] / [+High] / [-Back] (POG > PRG, PCG > Awutu)
 [+Labial]
 [+Voice]
 [-Nasal]
 b
 j
- *C > [+Voice] / stem-medial and prefix-initial (POG > PMG)
 [-Continuant]
 [+Back]
 [-Voice]
 k, kp?
 g, gb?
- *C > [+Voice] / stem-medial and prefix-initial (PMG > Gichode)
 [-Continuant]
 [-Voice]
 p, t, k, kp?
 b, d, g, gb?

7. *V C > V ## (PG > PSG)
 [+Nasal] [+Nasal]
8. *C > [+Continuant] (PG > PSG)
 [+Labial] [-Labial]
 [-Voice] h
 [-Nasal]
 p
9. *C > [-Lateral] / V __ V stem-medial (PG > PSG)
 [+Lateral] r POG > PRG)
 l
10. *C > [+Back] / __ V (PG > PSG)
 [+Continuant] w [+Back]
 [+High]
 y
- 10a. *C > [-Back] / __ V (PSG > PCG)
 [+Continuant] y [-Back]
 [+Back]
 w
11. *C > [-Back] (PSG > PCG)
 [+Labial] p
 [+Back]
 kp
12. *C > [+Voice] / __ V (PCG > Efutu)
 [+Continuant] [+Back] w [+Back]
 [-Labial]
 [-Coronal]
 [-Voice]
 h
13. *C > [+Delayed Release] / __ i (PSG > PHG)
 [+Coronal] ts, j
 [-Nasal]
 [-Cont.]
 t, d
14. *C > [-High] / __ V (PHG > Larteh)
 [+Del. Rel.] ts [-Front]
 [+Coronal] [-High]
 [+High]
 ĉ
15. *C > [+Coronal] / __ V (PHG > Larteh)
 [-Continuant] ĉ [-Back]
 [-Nasal] [+High]
 [+High]
 k