

Phonemic Statement of Canela

Preliminary Version

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2009*

* The original version of this paper was made available in 1971 as No. 112 of the Arquivo Linguístico (Summer Institute of Linguistics, Brasília, DF). This is an edited version, modified in various ways to make it more readable and clearer; but the original data and analyses have been faithfully maintained.

INDEX

- 1 Chart of the Phones
 - 1.1 Contoids
 - 1.2 Vocoids
 - 1.3 Other Data
- 2 Interpretation
 - 2.1 Syllable Patterns
 - 2.1.1 Contrastive Syllable Patterns
 - 2.1.2 Contrastive Consonant Clusters
 - 2.2 Interpretation of Suspect Segments
 - 2.2.1 Consonants
 - 2.2.2 Nasalized Vowels
 - 2.3 Interpretation of Suspect Sequences
 - 2.3.1 Alveolar Affricate (t_s)
 - 2.3.2 Velar Affricate (k^h)
 - 2.3.3 Nasalized Velar Consonant (ηg)
 - 2.3.4 Homorganic Consonant Clusters (bm) + (dn)
 - 2.3.5 Long Consonants
 - 2.3.6 Long Vowels
 - 2.3.7 Utterance Final Consonants and Vowel Release
 - 2.4 Interpreted Phonetic Chart
 - 2.4.1 Consonants
 - 2.4.2 Vowels
 - 2.5 General Phonetic Rules
 - 2.5.1 Vowel Release of Consonants
 - 2.5.2 Nasalized Allophones of /l/ /v/ /y/
 - 2.5.3 Degree of Friction in Fricatives
 - 2.5.4 Voiced Variants of Unaspirated Stops
 - 2.6 Chart of Possible Contrasts
 - 2.6.1 Consonants
 - 2.6.2 Vowels
 - 2.7 Evidence of Contrast Chart

- 3 Chart of the Phonemes
 - 3.1 Consonants
 - 3.2 Vowels
 - 3.3 Other Data
 - 3.3.1 Stress
 - 3.3.2 Long Consonants
 - 3.3.3 Long Vowels

- 4 Formational Statement of the Phonemes
 - 4.1 Formational Statement of the Non-Occlusives
 - 4.2 Formational Statement of the Nasal Occlusives
 - 4.3 Formational Statement of the Oral Occlusives
 - 4.4 Formational Statement of the Vowels

1 Chart of the Phones

1.1 Contoids

p	t	ts	k	k ^h	ʔ
p ^ə	t ^ə		k ^ə		
b	d		g		
m	n				
m ^ə	n ^ə		ŋg		
b _m	d _n		g		
v	l ð	z ʒ		h	
w	ɹ ɹ̃	y ʏ		x	
w ^ə	ɹ ^ə ɹ̃ ^ə	y ^ə ʏ ^ə			

1.2 Vocoids

Non-syllabic i			Non-syllabic u
i ð		ï ð̃	u ð̃
e		ë	o
ɛ ê		ë ễ	ɔ ð̃
	a ð̃		

1.3 Other Data

Stress

Syllable Break

Consonant Length

Vowel Length

2. Interpretation

2.1 Syllable Patterns

2.1.1. Contrastive Syllable Patterns

V	[<u>a</u> . 'pa]	/apa/	"your arm"
VC	[<u>in</u> . 'tso]	/ɪntso/	"it's sweet"
CV	[<u>ku</u> . 'he]	/kuhe/	"abcess"
CV·	[<u>ku</u> ·. 'he]	/ku·he/	"bow"
CVC	[<u>tɛp</u>]	/tɛp/	"fish"
CCV	[<u>kla</u>]	/kla/	"paca"
CCV·	[<u>pli</u> ·. 'ti]	/pli·ti/	"cow/large animal"
CCVC	[<u>in</u> . 'kɛɛ]	/ɪnkɛɛ/	"he sang"

Non-suspect syllables have only one vowel. Stress falls on the final syllable of nouns and verbs in isolation.

2.1.1.1 V Syllable Pattern

Filled by only three vowels: /i/, /a/, /u/.

2.1.1.2 VC Syllable Pattern

Vowel slot filled by only four vowels: /i/, /ĩ/, /a/, /ã/.

Note: The nasal vowels /ã/ and /ĩ/ occur only before nasal consonants.

Consonant slot filled by only three consonants: /v/, /y/, /h/.

VC syllables occur only in unstressed positions.

2.1.1.3 CV Syllable Pattern

Consonant slot filled by all 12 consonants: /p/, /t/, /ç/, /k/, /k>/, /m/, /n/, /ɲ/, /v/, /l/, /y/, /h/.

Vowel slot filled by all 17 vowels: /i/, /ĩ/, /u/, /e/, /ë/, /o/, /ɛ/, /ẽ/, /ɔ/, /a/, /ĩ/, /ĩ/, /ũ/, /ẽ/, /ẽ/, /õ/, /ã/.

2.1.1.4 CV· Syllable Pattern

Consonant slot filled by all 12 consonants.

Vowel slot filled by all 17 vowels.

Note: Most CV· syllables occur as part of the morpheme boundary phenomena which will be described later.

2.1.1.5 CVC Syllable Pattern

Onset slot is filled by all 12 consonants.

Coda slot is filled by only 9 consonants: /p/, /t/, /k/, /m/, /n/, /v/, /l/, /y/, /h/. Three consonants do not occur: /ç/, /k>, /ŋ/.

Vowel slot is filled by all 17 vowels.

2.1.1.6 CCV Syllable Pattern

Consonant slot filled by 11 consonant clusters: /p1/, /k1/, /k>1/, /m1/, /v1/, /k>v/, /çv/, /tv/, /kv/, /py/, /k>y/. One consonant cluster does not occur, /ky/.

In CCV syllables where /1/ is the second phoneme in the consonant cluster, only 11 vowels fill the peak slot: /i/, /ī/, /u/, /ë/, /ε/, /o/, /ɔ/, /a/, /ĩ/, /ẽ/, /õ/. Six vowels do not occur: /ĩ̄/, /ũ/, /ẽ̄/, /ã/, /e/, /ë̄/.

In CCV syllables where /v/ is the second phoneme in the consonant cluster, only 3 vowels fill the peak slot: /a/, /ë/, /ĩ/.

In CCV syllables where /y/ is the second phoneme in the consonant cluster, only 3 vowels fill the peak slot: /e/, /ë/, /ĩ/.

2.1.1.7 CCV· Syllable Pattern

Note: CCV· syllables occur only as part of the morpheme boundary phenomena which will be described later.

Consonant slot filled by only 4 consonant clusters: /p1/, /k1/, /k>1/, /çv/. 8 consonant clusters do not occur: /m1/, /v1/, /kv/, /k>v/, /tv/, /py/, /ky/, /k>y/.

In CCV· syllables where /1/ is the second phoneme of the consonant cluster, the peak slot is filled by only 5 long vowels: /i·/, /ī·/, /ë·/, /o·/, /a·/.

In CCV· syllables where /v/ is the second phoneme of the consonant cluster, the peak slot is filled by only one long vowel: /ẽ·/.

2.1.1.8 CCVC Syllable Pattern

Onset slot filled by all 12 consonant clusters: /p1/, /k1/, /k>1/, /m1/, /v1/, /kv/, /k>v/, /□v/, /tv/, /py/, /ky/, /k>y/.

In CCVC syllables where /1/ is the second phoneme of the consonant cluster, the peak slot is filled by only 15 vowels: /i/, /ī/, /u/, /e/, /ë/, /o/, /ε/, /ë̄/, /ɔ/, /a/, /ĩ/, /ũ/, /ẽ̄/, /ẽ̄̄/, /õ/. 2 vowels do not occur: /ĩ̄/, /ã/.

Note: both /ĩ̄/ and /ã/ are rare phonemes.

In CCVC syllables where /l/ is the second phoneme, the coda slot is filled by only 8 consonants: /t/, /k/, /m/, /n/, /v/, /l/, /y/, /h/. 4 consonants do not occur: /p/, /ç/, /k>/, /ŋ/.

Note: /ç/ and /k>/ are affricates and never occur in the coda slots of syllables. /ŋ/ is a very rare phoneme.

In CCVC syllables where /v/ is the second phoneme in the consonant cluster, the peak slot is filled by only 3 vowels: /ĩ/, /i/, /ë/.

In CCVC syllables where /v/ is the second phoneme in the consonant cluster, the coda slot is filled by only 4 consonants: /k/, /m/, /n/, /l/. 8 consonants do not occur: /p/, /t/, /ç/, /k>/, /ŋ/, /v/, /y/, /h/.

In CCVC syllables where /y/ is the second phoneme in the consonant cluster the peak slot is filled by only 1 vowel: /e/.

In CCVC syllables where /y/ is the second phoneme in the consonant cluster the coda slot is filled by only 3 consonants: /n/, /l/, /y/. 9 consonants do not occur in this slot.

2.1.2 Contrastive Consonant Clusters

- a) within the syllable
- b) at syllable boundary

Consonant Clusters with /y/ as the second phoneme

[a. 'pze]	/apye/	"your husband"
[tɛb. 'zet]	/tɛp yet/	"hanging fish"

Consonant clusters with /v/ as second phoneme

[a. 'twë ^b m]	/atvëm/	"you are fat"
[p ["] d. 'wël]	/pët vël/	"to the mambira"

Consonant clusters with /l/ as second phoneme

[ku. 'vlë]	/ku·vlë/	"it's slimy"
[k ^h luv. 'lɛ]	/kluvlɛ/	"little arrow"

2.2 Interpretation of Suspect Segments

2.2.1 Consonants

2.2.1.1 Non syllabic [i] and [u] are both interpreted as consonants because:

- a) they parallel the distribution of non-suspect consonant [l] in consonant clusters.

[k ^h la]	/kla/	"paca"
[tswa] [tsua]	/çva/	"swim"
[pze]	/pye/	"sand"

b) They are in complementary distribution with [z] and [v] and can be considered their allophones. See 4.2.3.

c) Considering them as vowels would create new syllable patterns. Not [k^hui] /k[>]ui/ CVV, but [k^hui] /k[>]uy/ CVC "ear plug"

2.2.1.2 Fricative glottal [h] is interpreted as a consonant since it parallels the distribution of non-suspect consonants.

[ho]	/ho/	"leaf"
[ko]	/ko/	"water"
[ku. 'hi]	/kuhi/	"fire"
[ku. 'mẽ]	/kumẽ/	"to him"
[ka ha ka. 'pa]	/ka ha kapa/	"you will take out"

2.2.2 Nasalized Vowels

Nasalized Vowels are interpreted as single units because:

a) If we interpreted them otherwise, the only possibility for interpretation is as a sequence of oral vowel plus nasalized consonant. However, nasalized vowels are in contrast with oral vowels followed by nasalized consonants.

[i. 'k ^h ɔ]	/ik ^h ɔ/	"I drink"
[i. 'k ^h ɔ̃n]	/ik ^{>} ɔ̃n/	"my knee"
[tɔ̃n]	/tɔ̃n/	"made"

b) Interpreting nasalized vowels as a sequence of oral vowel followed by a nasalized consonant would produce new consonant clusters.

2.3 Interpretation of Suspect Sequences

2.3.1 Alveolar Affricate

[ts] is interpreted as one unit since its distribution parallels that of the non-suspect single units [p] [t], [k] both in single consonant slots and in consonant clusters. To interpret it as a sequence would create new consonant clusters.

[tsa]	/tʃa/	"stand up"
[ka]	/ka/	"you"
[ĩn. 'tso]	/ĩnʃo/	"it's sweet"
[ĩn. 'ko]	/ĩnko/	"his flea"
[po]	/po/	"thatch"
[tswa]	/tʃva/	"bathe"
[ãm. 'kwa]	/ãmkva/	"receive"
[twë]	/tvë/	"pound!"
[tswë]	/tʃvë/	"name ending for deceased person"

2.3.2 Velar Affricate [k^h]

[k^h] is interpreted as one unit since it parallels non-suspect single units within the syllable. To interpret it as a sequence would create new consonant clusters.

[a . 'k ^h l̥a]	/ak ^h la/	"your child"
[k ^h l̥a]	/kla/	"paca"
[k ^h o]	/k ^h o/	"club"
[ko]	/ko/	"water"
[khwa]	/k ^h va/	"well"
[ãm . 'kwa]	/ãmkva/	"receive!"

2.3.3 Nasalized Velar Consonant [ŋ̃]

[ŋ̃] is interpreted as one unit since it:

- a) occurs in free fluctuation with [ŋ] and [g] and
- b) occurs in different dialects as [ŋ] and [g] respectively.

To interpret it as a sequence would make it the only word initial nasal-stop consonant cluster.

[ka . . 'ŋ̃]	[ka . . 'ŋ̃g̃]	[ka . . 'g̃]	/ka . ŋ̃/	"snake"
[ŋa . . 'l̥a]	[ŋga . . 'l̥a]	[ga . . 'l̥a]	/ŋa . la/	"your arm"

[ŋ] ~ [ŋ̃] ~ [g] velar nasal consonants freely fluctuate between [ŋ] ~ [ŋ̃] ~ [g] preceding both oral and nasal vowels.

Note: velar nasal consonant [ŋ̃] /ŋ/ has a variant [g] which is phonetically identical to the [g] allophone of /k/. See 4.4.3.

2.3.4 Homorganic Consonant Clusters [bm] and [dn]

[bm] and [dn] are interpreted as one unit each because:

- a) interpreting them as sequences would create a new syllable pattern and
- b) they occur only following an oral vowel and are submembers of their corresponding nasal consonants.

[ho ^b m]	/hom/	"powder"	
[to ^d n]	/ton/	"armadillo"	
[pze ^d n . 'tso ^b m]	/pyen ^ɔ om/	"sand"	
[iʔk ^h ε ^d n]	/ihk ^h εn	"it's bad"	
[pε ^d n]	/pen/	"honey"	(see 4.4.1)

2.3.5 Long Consonants are interpreted as single consonant units.

They occur only "word" or "rhythm" group medial following short vowels, whereas short consonants occur following long vowels.

[i.'ta ka.'põ]	/ita ka·põ/	"sweep this"
[i.'ta kap..'i]	/ita kapi/	"try this"
[ku·.'he]	/ku·he/	"bow"
[kuh·.'e]	/kuhe/	"abcess"

2.3.6 Long Vowels

Long vowels are interpreted as single vowels (written v·) because there are no non-suspect vowel sequences.

It may be necessary to interpret vowel length as a supra-segmental feature because in at least one dialect it does not seem to be fixed to any one syllable; possibly being determined by its occurrence in larger phonological units. In another dialect however, vowel length seems fixed to certain syllables.

[ku·.'he]	/ku·he/	"bow"
[kum.'mẽ kuh.'heʔ.'nõ ɣõ]	/kumẽ kuhehnõ ɣõ/	"give him another bow"
[mĩ]	/mĩ/	"alligator"
[mĩ·.'pĩ]	/mĩ·pĩ/	"take the alligator"
['mĩp.pĩl 'nããǎε]	/mĩ pĩl nããǎε/	"don't take the alligator"

In this paper the dialect where the length is fixed is being considered.

2.3.7 Utterance Final Consonants

Utterance Final Consonants and their Vowel release are interpreted as single units, since they are submembers of the corresponding consonants.

[lɔp°]	/lɔp/	"dog"	
[pul ^u]	/pul/	"field"	
[klɔw ^a]	/klɔv/	"burity log"	
[hipεy°]	/hipεy/	"kill all!"	see 4.1

2.4 Interpreted Phonetic Chart

2.4.1. Consonants

p <u>p^ə</u> b	t <u>t^ə</u> d	ç	k <u>k^ə</u> g	k ^{>}	ʔ
m <u>m^ə</u> b _m	n <u>n^ə</u> d _n		ŋ <u>ŋ^g</u> g		
v w <u>w^ə</u>	l <u>l̃</u> <u>l̃^ə</u>	z y <u>y^ə</u>	ž ÿ <u>ÿ^ə</u>	h x	

2.4.2 Vowels

i e ε	ĩ ẽ		ï ë ë	ĩ ẽ	u o ɔ	ũ õ
		a		ã		

2.5 General Phonetic Rules

2.5.1 Vowel Release of the Consonants

a) All consonants have a vowel release utterance final, and in some dialects also utterance medial. The occurrence and "strength" of this vowel release varies and fluctuates freely among individuals and between dialects.

Note: /k[>]/, /ç/, /ŋ/, /h/ have never been found in utterance final positions, therefore are not part of this phenomenon.

b) The quality and occurrence of this release are predictable as follows: /p/, /t/, /k/, /l/, /m/, /n/ have a release which fluctuates in strength and with non-release between dialects. The release has the quality of the preceding vowel except when the vowel is /a/, in which case it releases into [i] high front vowel.

[l̥ɔp] ~ [l̥ɔp°]	/lɔp/	"dog"
[pit] ~ [pit ⁱ]	/pit/	"only"
[pɔk] ~ [pɔk°]	/pɔk/	"burn"
[ŋɔ̃l] ~ [ŋɔ̃l ⁵]	/ŋɔ̃l/	"you sleep"
[tap] ~ [tap ⁱ]	/tap/	"manioc squeezer"
[pat] ~ [pat ⁱ]	/pat/	"snake"
[pak] ~ [pak ⁱ]	/pak/	"scorpion"
[a. 'pal] ~ [a. 'pal ⁱ]	/apal/	"your foot"
[a. 'pam] ~ [a. 'pam ⁱ]	/apam/	"your father"
[tũm] ~ [tũm ^a]	/tũm/	"old"
[to ^d n] ~ [to ^d n°]	/ton/	"armadillo"

c) /v/ and /y/ syllable final always occur with release, the quality of which is as follows:

/v/ vowel release has a low-central vowel quality in the two examples found so far.

[k ^h l̥uw ^a]	/k ^h l̥uv/	"arrow"
[k ^h l̥w ^a]	/k ^h l̥v/	"burity log"

/y/ vowel release has a high-front vowel [i] quality except following /i/ in which case its release has a low central vowel quality [a].

[k ^h uy ⁱ]	/k ^h uy/	"ear plug"
[k ^h iy ^a]	/k ^h iy/	"roasting fire"

2.5.2 Nasalized Allophones

/l/, /v/, /y/ have nasalized allophones which occur in syllables with nasalized vowels.

[mĩɔ̃]	/mlĩɔ̃/	"soak"
[kut. 'tɛ k ^h wĩn]	/kutɛ k ^h vĩn/	"it broke"
[tɔ. 'ʒĩ]	/tɔ. yĩ/	"sit down"

2.5.3 Degree of friction of all fricatives varies among individuals and between dialects.

2.5.4 Voiced Variants of Unaspirated Stops

Voiceless unaspirated stops /p/, /t/, /k/ have a voiced variant [b], [d], [g] which occurs syllable initial in unstressed syllables following voicing and syllable final preceding voicing.

The voiceless unaspirated stops occur elsewhere, for example:

- utterance initial
- initial in stressed syllable
- final in syllable before voicelessness
- utterance final

[pat]	/pat/	"snake"
[tɛp.'ti]	/tɛpti/	"big fish"
[tɛp]	/tɛp/	"fish"
[pat.'ti]	/patti/	"big snake"
[ko]	/ko/	"water"
[pak.'ti]	/pakti/	"big scorpion"
[i.'ta bit ⁱ]	/ita pit/	"that's all"
[tɛb.'ɿɛ]	/tɛplɛ/	"little fish"
[pad.'ɿɛ]	/patlɛ/	"little snake"
[a.ga. . 'k ^h ok]	/aka.k ^h ok/	"you speak"
[pag.'ɿɛ]	/paklɛ/	"little scorpion"

2.6 Chart of Possible Contrasts

1. Chart of sets to be proven as contrastive or allophones.
2. Phones enclosed in circles are possible allophones.
3. Any sets from this chart not in contrast will be described in the Formational Statements.

2.6.1 Consonants

(p)	(t) (t̥)	(k) (k ^h)	(ʔ)
(m)	(n)	(ŋ)	
		(ŋg)	
		(g)	
(v)	(l) (z)		
(w)	(l̥)	(y)	(x) (h)

2.6.2 Vowels (all vocoids are possible allophones)

i	ĩ		ï	ĩ̃	u	ũ
e			ë		o	
ɛ	ẽ		è	ẽ̃	ɔ	õ
		a	ã			

2.7 Evidence of Contrast Chart

- Note: a) Vertical columns contrast consonants with other consonants in identical or analogous environments.
b) Rows contrast vowels.

	i	ĩ	u	e	ë	o	ε	ë
p	pi- climb	pĩ- pick up	apu- present tense	pe- distant past tense	pë- carry	po- straw	pεk- weak	pë- eat
t	ti- large	tĩ- die	tu- all	te- out of	atël- dew	ton- armadil- lo	tε- past tense	
ç	çi- give		ahçun- ant	-çe - string	-çë - bitter	ço- sweet		-çë - pain
k	kiz- fire place	kĩt- quickly	ku·he- bow	ke- no		ko- water	kεt- uncle	kë- patio
k ^{>}	avk ^{>} i- relator	k ^{>} ĩ·pe- a little	kuk ^{>} u- eat	avk ^{>} e- name		k ^{>} o- staff		k ^{>} ë- skin
m								
n								
ŋ								
v			vu- expres- sion		vël- toward	vo- expres- sion	vεvε- butterfly	
l	-li - place	lĩ- line up			lë- yet		lε- little	lëm- woods
y	yicu- full			ye- relative	yëyë- name			
h	hi- bone	hĩ- seed	hu- future tense	he- string	hë- bitter	ho- leaf	hε- expres- sion	hë- pain
kl				ĩnkle- three	klën- fish	klot- Pleiades	kλε- egg	
k ^{>} l		k ^{>} lĩ- cold	k ^{>} luv- arrow	kak ^{>} le- scratch	k ^{>} lën- pull out	k ^{>} lo- pig	k ^{>} lε- hole	k ^{>} lë- dry

	ɔ	a	ĩ	ĩ	ũ	ẽ	ẽ	õ	ã
p	pɔ- deer	pa- arm	pĩ- wood	pëpĩn- don't know		apẽ - morning	pẽ- kiss	põ- plateau	
t	tɔ- with	ta- rain	tĩ- alive		tũm- old			tõy- sister	
ç		çá- stand			çũ- father				hõ·çã- worm
k	kɔ- look out!	ka- you				kẽ- bird			
k>			k>ĩ- like			k>ẽn- stone	k>ẽm- in	k>õ-drink	
m			mĩ- alligator		amũ- relator	mẽ- and/ plural	mẽ- emu	mõ- go	kamã- only
n			nĩ- sexual intercourse	nĩ' lɛ- tame		nẽ- and	nẽ- in	nõ- lie down	nã·lɛ- negator
ŋ					ŋũhhõn- wash		ŋẽn- squeeze	ŋõ- give	
v		va- I							
l	lɔp- dog	la.mẽ- already	lĩt- look		lũm- direc- tion		kolẽ- name	aylõ- turn	
y		yakɔt- crooked	yĩ- meat	yĩ sit	yũ- posses- sive			yõ- posses- sive	
h		ha- future tense	hĩ- meat	hĩl- sat	hũm- man		hẽk- hiccup	hõ- hip	hã- expres- sion
kl	klɔ- hot	kla- paca							
k>l	k>lɔl- paint	k>la- child	k>lĩ- dwelling			k>lẽ- eat	k>lẽ- head	k>lõk- beat	k>lã- look here

3. Chart of The Phonemes

3.1 Consonants

		Labial	Alveolar	Palatal	Velar
<u>Occlusives</u>					
Oral	Unaspirated	p	t		k
	Aspirated		ç		k ^{>}
Nasal		m	n		ŋ
<u>Non-Occlusives</u>		v	l	y	h

3.2 Vowels

		Non-Central			Central
	Placement	Front	Back		
			Unrounded	Rounded	
Oral	High	i	ï	u	a
	Mid	e	ë	o	
	Low	ε	ë	ɔ	
Nasal	High	ĩ	ĩ	ũ	ã
	Low	ẽ	ẽ	õ	

3.3 Other Data

3.3.1 Stress falls on the final syllable of nouns and verbs.

3.3.2 Long consonants occur only "word" or "rhythm" group medial following short vowels.
See 2.3.5

3.3.3 Long vowels contrast with short vowels.

[ku·.'he]	/ku·he/	"bow"
[ku.'he]	/kuhe/	"abcess"
[ka·.'tswa]	/ka·çva/	"salt"
[ka.'tswa]	/kaçva/	"night"
[hë·.'kludn]	/hë·klun/	"he danced"
[ha.'k ^h li]	/hak ^h li/	"he is happy"

4. Formational Statement of the Phonemes

4.1 Formational Statement of the Non-occlusives

The following is a list of phonemes having allophonic variations not covered in the general statement above.

4.1.1 /v/ [v] voiced labiodental fricative with very light friction occurs syllable initial, utterance initial and intervocalic. See 4.2.1.2.

[va]	/va/	"his teeth"
[i.'ta vël ^ě]	/ita vël/	"toward here"

[w] voiced bilabial frictionless continuant occurs elsewhere, e.g. syllable final and second (final) in consonant clusters.

[aw.'k ^h ε]	/avk ^ɤ ε/	"left side"
[k ^h wa]	/k ^ɤ va/	"well"

4.1.2 /y/ [z] voiced fronted alveolar grooved fricative occurs final in consonant clusters and initial in stressed syllables. See 4.2.1.2.

[i.'pze]	/ipyε/	"my husband"
[pī·.'ze]	/pī·yε/	"women"
[a.'žš]	/ayš/	"your buttock"
[zët]	/yët/	"potato"

[y] voiced frictionless front palatal continuant occurs elsewhere, e.g. syllable final and unstressed syllable initial with optional lenis friction.

[im.'pεy ^ɨ]	/impεy/	"it's good"
[aw.ya·.'he]	/avya·he/	"hunt!"
[pze.ya.'klo]	/pyε yaklo/	"dust of the ground"

4.1.3 /l/ [l̥] voiced alveolar lateral flap occurs: intervocalic, final in consonant clusters, utterance initial, and following consonants.

[in.'k ^{l̥} i·l̥ε]	/inkli·lε/	"small"
[p ^{l̥} o]	/plo/	"ashes"
[l̥p]	/lop/	"dog"
[tsεp.'l̥ε]	/tsep ^{l̥} ε/	"little bat"

[l] voiced alveolar lateral occurs elsewhere, e.g. syllable final, before consonants and utterance final.

[pul]	/pul/	"field"
['pul k ^h ëm]	/pul k ^ɤ ëm/	"in the field"

4.1.4 /h/ [ʔ] glottal stop occurs syllable final preceding consonants.

[iʔ. 'k^hɛ̃] /ihk[>]ɛ̃/ "his skin"
[koʔ. 'pipⁱ] /kohpip/ "mat"

[x] voiceless front velar flat fricative occurs before high oral vowels. See 4.2.1.2.

[iʔ. 'xi] /ihhi/ "his bone"
[ku. 'xi] /kuhi/ "fire"
[xup. 'he] /huphe/ "wild"

[h] voiceless glottal frictionless continuant occurs elsewhere.

[hām] /hām/ "he stood"
[pɛ̃l. 'ho] /pɛ̃lho/ "tobacco"

4.2 Formational Statement of the Nasal Occlusives

4.2.1 /m/ [m] voiced bilabial nasal

[ha. 'mā] /hamā/ "his chin"
[k^hɛ̃m. 'pa] /kɛ̃mpa/ "listen!"
[m^lɔ̃l] /m^lɔ̃l// "soak"

4.2.2 /n/ [n] voiced alveolar nasal

[to^dn] /ton/ "armadillo"
[nɛ̃] /nɛ̃/ "and"

4.2.3 /ŋ/ [ŋg] ~ [ŋ] ~ [g] voiced velar nasal fluctuating with prenasalized voiced velar stop, fluctuating with a voiced velar stop. See 4.4.

[ka·. 'ŋgɛ̃] ~ [ka·. 'ŋɛ̃] ~ [ka·. 'gɛ̃] /ka.ŋɛ̃/ "snake"
[ŋgɔ̃l³] ~ [ŋɔ̃l³] ~ [gɔ̃l³] /ŋɔ̃l/ "sleep"

Note: This variation seems to occur between dialects.

4.3 Formational Statement of the Oral Occlusives.

4.3.1 Explanatory Note on [g]

The [g] variant of /k/ and [g] dialectic variant of /ŋ/ are separate. The [g] variant of /k/ parallels the [b] and [d] variant of /p/ and /t/ in distribution. See 2.5.4.

The [g] dialectic variant of /ŋ/ contrasts with /k/.

[gõĩ̃ ³]	/ŋõl/	"sleep"
[ko]	/ko/	"water"
[ga·.'ǎ]	/ŋa·la/	"your arm"
[ka·.'ǎ]	/ka·lǎ/	"deer"
[tɛp·.'gõ]	/tɛpŋõ/	"give the fish"
[tɛp ka·.'ti]	/tɛp kati/	"big fish"

4.3.2 Unaspirated Stops

/p/	[p]	voiceless bilabial stop
/t/	[t]	voiceless alveolar stop
/k/	[k]	voiceless velar stop

4.3.3 Aspirated Stops.

/ç/ [ts] affricated back alveolar stop fluctuates in dialect difference with [tš] affricated alveopalatal stop.

/k>/ [k^h] voiceless velar aspirated stop.

4.4 Formational Statement of the Vowels

4.4.1 Oral Vowels.

/i/	[i]	voiced high close front unrounded oral vocoid
/e/	[e]	voiced mid close front unrounded oral vocoid
/ɛ/	[ɛ]	voiced mid open front unrounded oral vocoid
/i/	[i]	voiced high close back unrounded oral vocoid
/ë/	[ë]	voiced mid close back unrounded oral vocoid
/Ë/	[Ë]	voiced low open back unrounded oral vocoid
/u/	[u]	voiced high close back rounded oral vocoid
/o/	[o]	voiced mid close back rounded oral vocoid
/ɔ/	[ɔ]	voiced low close back rounded oral vocoid
/a/	[a]	voiced low open central unrounded oral vocoid

4.4.2 Nasalized Vowels

/ĩ/	[ĩ]	voiced high close front unrounded nasalized vocoid
/ẽ/	[ẽ]	voiced low open front unrounded nasalized vocoid
/ĩ̃/	[ĩ̃]	voiced high close back unrounded nasalized vocoid
/ẽ̃/	[ẽ̃]	voiced low open back unrounded nasalized vocoid
/ũ/	[ũ]	voiced high close back rounded nasalized vocoid
/õ/	[õ]	voiced low close back rounded nasalized vocoid
/ã/	[ã]	voiced low open central unrounded nasalized vocoid