STUDIES IN

ECUADORIAN INDIAN LANGUAGES: I

introduction by Cathrine Peeke

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Editor's Note

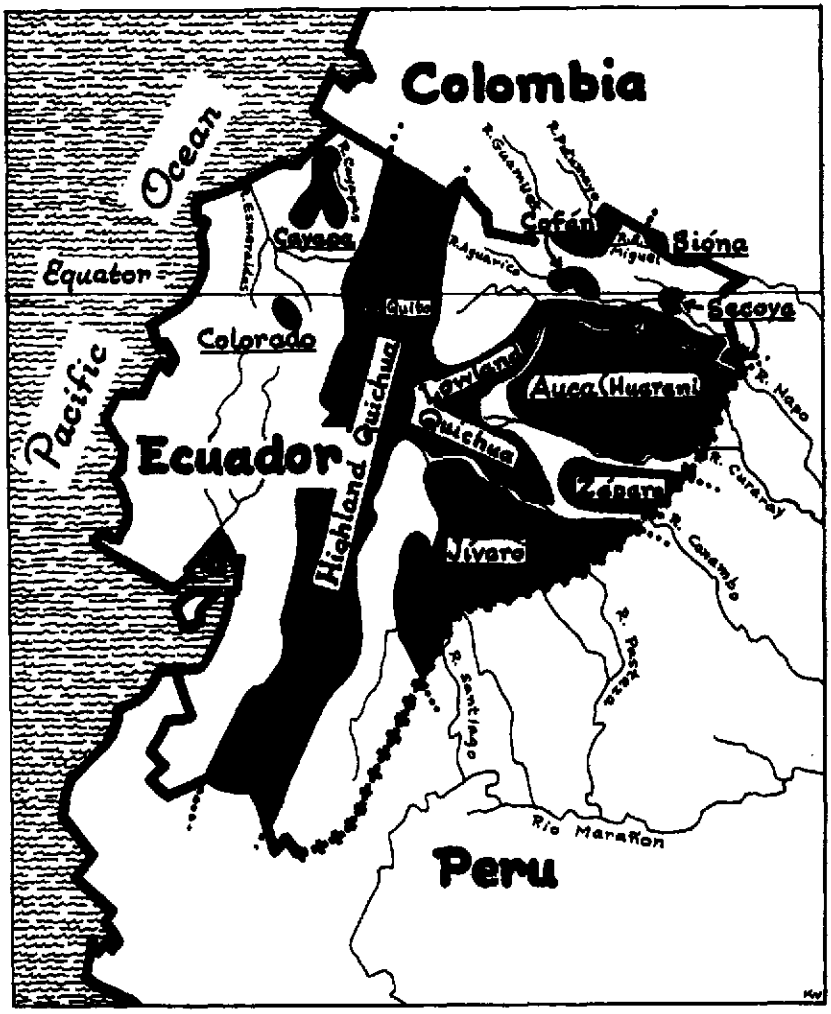
The papers in this volume are the result of linguistic field work carried on in Ecuador by members of the Summer Institute of Linguistics. As Miss Peeke points out in her Introduction, there are only nine aboriginal languages spoken in Ecuador today, and articles on the phonemics or grammar of seven of these languages are presented here. The one comparative article lists the phonemes of an eighth language. Only a discussion of Jívaro is lacking to make the volume touch upon each Indian language of the country.

Most of the articles were developed in linguistic workshops on the field supervised by Kenneth L. Pike. His influence is apparent in most of the articles in the volume, especially in the grammatical ones. Miss Orr's phonemic article was her Master's thesis at Indiana University, and Moore's article was worked on while he was in attendance there.

Miss Catherine Peeke, Chairman of the SIL Ecuadorian linguistic committee, served as assistant editor of the volume. Since she has been intimately associated with the project, I requested that she prepare an Introduction, giving a survey of the linguistic picture in Ecuador and pointing out items of particular interest about the articles, and a Bibliography of Ecuadorian Indian (and related) languages.

It is hoped that this volume will contribute substantially to the scanty information now available on South American Indian languages.

Table of Contents



Indian Languages of Ecuador

Introduction

This first of a series of studies in Ecuadorian Indian languages is a collection of articles concerning eight of the nine Indian languages found in present-day Ecuador (see map). While coverage of the eight languages is not uniform, in that a given language may be represented only by a comparative article or by an article on phonemics or on grammar, yet such articles describe structural types which are fairly representative of phonology and grammar of the nine languages.

Structural similarities and phenomena common to all of the languages do not necessarily indicate observable family relationships among the nine languages; on the contrary, present findings tend to confirm classification of the nine languages as belonging to seven different families or isolated classifications (McQuown, 1955; Mason, 1950).

Relationship of Cayapa and Colorado, of the Barbacoan Chibchan subfamily (Murra, 1948), is demonstrated in Moore's "Correspondences in South Barbacoan Chibcha," found in the present volume.

Siona and Secoya (McQuown's "Secoya-Gai" and "Sionf") are closely related members of the Western Tucanoan family. For phonology of a related dialect, in which tone is phonemic, see Velie and Brend (n.d.).

Our "Quichua" (Ecuadorian pronunciation and spelling) is the "Quechua" which is generally classified as part of the Quechumaran phylum. Lowland dialects of Quichua described in this volume are not specifically indicated in any listing we have seen. Their existence attests to the success of efforts made by the Incas and others to impose the Quichua language upon all subject tribes, whose historical origin and

aboriginal language have thus been effectively obliterated (Prescott, 1874:81-82).

Two further language families, the Jívaro and the Záparo have representatives in Ecuador. For grammar and phonology of the Macuma dialect of Jívaro, see Turner (1958a, 1958b). Other Jivaroan languages are Huambisa (Beasley and Pike, 1957) and Aguaruna (Larson, 1955, n.d.) in Peru, and Achuara or Achual in Ecuador. The Zaparoan language family includes Záparo in Ecuador, and in Peru the three languages: Shimigae (Peeke and Sargent, 1959), Iquito (Eastman and Eastman, n.d.), and Arabela (Rich, n.d.)

Auca and Cofán, listed as "unclassified" by McQuown (1955), remain so in our judgment. While it is true that in a phylum classification, more inclusive groupings may be made (Steward and Faron, 1959:22-23; Swadesh, 1959), yet present findings of our investigators give no indication as to the direction such grouping might take, with respect to the seven language families represented in Ecuador. It is hoped that this volume, as well as dictionaries soon to be published will contribute substantially to materials available for comparative work in this area of South America.

Phonological studies are included in the present volume for six of the nine languages. The phonemes of Colorado may be found in the comparative article in this volume and other publications by Moore. Studies of Záparo phonemes (Sargent, 1959) and the phonology of Jívaro (Turner, 1958) have been published elsewhere.

Auca, Cayapa, Cofán, Secoya, and Siona phonemic studies are presented here in a sufficiently uniform format to demonstrate the similarity of problems encountered in the area. Among these are problems related to phonemic nasalization of vowels in Cofán, Auca, Secoya, and Siona (although nasalization systems identical in Secoya and Siona are interpreted differently in the two descriptions). Common

to the five languages are questions of phonetic vowel length versus vowel clusters, multiple-stress systems which pattern differently in each language, and general indeterminacy with respect to conditioning of vowel allophones. Designed specifically for pointing up the latter problem, the basic format used allows contrast between phonemes to be established, then describes variants in terms of a norm with a range of allophones subject, in many instances, to quasi-conditioning.

The Quichua phonology statement, on the other hand, is more comprehensive in its treatment of phonemes according to distinctive features, distribution, frequency, and dialect variations, the materials for the latter being excerpted from a fuller treatment by Orr, to appear in Ecuador.

Grammar articles are more varied: Siona morphology presentation relies on text materials and charts, with tagmemic structure implicit in the breakdown of the charting; the Cayapa presents a preliminary tagmemic description of the morphology and syntax from sentence to word, with illustrative text material; the Quichua article outlines broad syntactic relationships perceived through but not described in terminology of the tagmemic model; and finally, the Záparo, written four years earlier than the others, is designed explicitly to illuminate the model as it then stood.

A particular emphasis of that period of tagmemic development, and hence of the article cast in that model, was subordination of included tagmemes to the sentence as a convenient threshold. Multi-dimensional relationship between sentence types was demonstrated by cross-cutting distribution of certain tagmemes in various sentence types. These emphases of early tagmemics overlap somewhat with concepts seen recently in Transformational Grammar, as does also the formulaic device for provision of alternate choices. In retrospect, this particular description is recog-

nized as being over-labelled and redundant, but it is presented without revision in order to point again to a priority of relevance and an extra dimension possibly obscured by recent widespread acceptance by those who use the tagmemic model of the concept of levels and its consequent simplicity of statement.

Of special theoretical interest, perhaps, is the final section of the article on Auca phonemics; here is an almost unique statement of, in the author's words, "dialect differences resulting from a case of extreme social isolation."

We offer, then, this contribution to linguistic studies, desiring to share data available peculiarly to us, to submit for consideration certain devices and concepts which have proved helpful to us, and to exhibit types of structure found in Ecuadorian languages.

Catherine Peeke
Bloomington, Indiana
December 20, 1961

Siona Phonemics (Western Tucanoan)

by Alva and Margaret Wheeler

0. Introduction. The salient features of Siona[1]

[1]The Siona Indians (Steward [1948] refers to the Siona as Sionf, but mentions Siona as an alternate name) number about two hundred and live on the upper Putumayo River. About fifty live on the Ecuador side and the remainder on the Colombia side of the river. Those of one dialect, most commonly known as Siona, numbering about one hundred and fifty, dwell in three villages, beginning with Nueva Granada just below the mouth of the Cuhembí River and continuing downriver to Buena Vista and Piñuña Blanca respectively. A distance of about twelve miles separates each of the villages, and eight Siona families are scattered along the river between Buena Vista and Piñuña Blanca.

Another dialect, referred to as Macaguaje, but also known as Siona, includes about fifty people, who dwell in two villages, El Tablero and El Hacha, located fifteen and twenty-five miles down the Putumayo from the mouth of the San Miguel River. Steward (1948) also mentions the Macaguaje as an alternate name for Enca-

phonemics as presented in this paper are (1) phonetic features of two series of stops, simple and glottalized, (2) variants of glottal stop, (3) length plus decrescendo and voiceless offglide patterns of vowel allophones, (4) stress patterns, and (5) syllable structure as conditioned by stress dynamics.

1. Consonant contrasts. Consonants consist of stops, sibilants, continuants, nasals, and glottals. The simple stop series /p/, /t/, /k/, and /k^w/ contrasts with the glottalized series /p'/, /t'/, /k'/, and /k^w'/ at each point of articulation, labial, alveolar, velar, and labiovelar:

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bellado, but later states (p. 739) that "the Macaguaje are evidently now called Sionf." Cofan and Witoto Indians also live in these same villages.

The authors gathered data for this paper on two four-month field trips to Buena Vista on the Putumayo River, Ecuador, during 1960 and 1961. The authors are especially indebted to Kenneth L. Pike for help in organizing the data at linguistic workshops in Limoncocha, Ecuador.

The term "Siona" is used by outsiders and the tribespeople alike, and consists of two Siona morphemes, /s'fó/ 'field', and /-na̱/ 'direction toward', the combination meaning 'to the field'. It is often used as a response to the greeting, 'Where are you going?'

Downriver ethnological information is based on a survey trip by M. B. Borman and O. E. Johnson of Summer Institute of Linguistics, September - October, 1958.

/p/, /p'/: /pété/ [pέʰtέ][2] 'duck', /p'étó/ [p'ιέʰtó] 'variety of palm nut'.

/t/, /t'/: /tíóhi/ [tíóhi] 'he is putting upon', /t'íóhi/ [t'ιíóhi] 'he is causing to submerge'; /tútú/ [túʰtú] 'wind', /tút'úp'í/ [túřúp'ιí] 'type of shoulder bag'.

/k/, /k'/: /kówí/ [kó·wí] 'claw', /k'ówí/ [k'ιó·wí] 'soup'.

/kʷ/, /kʷ'/: /kʷáóhi/ [kʷáóhi] 'it is calming', /kʷ'áóhi/ [kʷ'ιáóhi] 'he is enclosing'.

/k/, /kʷ/: /káháíyí/ [káháíyí] 'I intend to tell', /kʷáháyí/ [kʷáháyí] 'I am getting tired'.

Simple sibilants are alveolar /s/, and palatal /č/. Glottalized alveolar sibilant /s'/ and palatal /č/ contrast with simple alveolar /s/:

/s/, /s'/: /sáʔt'o/ [sáιʔᶿřo] 'entrance', /sạ́ʔsá/ [sạ́ιʔ̤ᶿsá] 'variety of hardwood', /s'áʔs'á/ [s'ιáιʔ̤ᶿs'ιá] 'variety of gnat'.

/s/, /č/: /sáóyí/ [sáóyí] 'I am sending', /čáóyí/ [t̪š̪áóyí] 'I am spearing'.

Simple palatal sibilant /č/ contrasts with voiceless

[2] All citation forms are pause-group medial unless otherwise indicated, in order to avoid pause-group final phonological features characteristic of elicitation forms. These features, such as glottal stop varying with /h/, are not discussed in this paper.

alveolar stop /t/: /túť'úp'ï/ [túřúp'ɨï] 'type of shoulder bag', /čúť'ú/ [ʧúřú] 'variety of snail'.

Continuants occur at the labial /w/ and palatal /y/ points of articulation. The labial continuant contrasts with labial and labiovelar stops:

/w/, /p/: /wékó/ [ẇé^{h}kó] 'variety of green parrot', /pékó/ [pé^{h}kó] 'maggot'.

/w/, /p'/: /wáhi/ [wá·hi] 'he is fighting', /p'áhi/ [p'ɨá·hi] 'he has'.

/w/, /k^{w}/: /wéhi/ [wɛ́·hi] 'he is resting', /k^{w}éhi/ [k^{w}ɛ́·hi] 'he is cutting'.

/w/, /k^{w}'/: /wíhi/ [wí·hi] '(the grass) is growing', /k^{w}'íhi/ [k^{w}'ɨí·hi] 'he is shouting'.

Nasals occur at the labial /m/ and alveolar /n/ points of articulation. The labial nasal contrasts with labial stops and continuants:

/m/, /p/: /mą́ʔká/ [mą́ɨʔ+ká] 'thing', /pą́ʔpá/ [pą́ɨʔ+pá] 'variety of palm tree'.

/m/, /p'/: /mį́ʔą́/ [mɨį́ɨʔɨą́ɨ] 'variety of gnat', /p'į́ʔą́/ [p'ɨį́ɨʔɨą́ɨ] 'class of small birds'.

/m/, /w/: /mę́ą́hi/ [mą̈ę́ą́hi] 'he is drifting', /wę́ą́hi/ [wą̈ę́ą́hi] 'it is drying up'.

The alveolar nasal contrasts with the palatal continuant:

/n/, [ñ] which is an allophone of /y/: /ʔį́nę́/ [ʔį́ną̈ę́]

'variety of palm fruit', /ʔi̱yę́/ [ʔi̱ñą́] 'this'; /nąsó/ [nąʰsó] 'variety of monkey', /yątá/ [ñąʰtá] 'variety of large ant'.

Glottals consist of a stop /ʔ/, simple fricative /h/, and labialized fricative /hᵂ/, which contrast with each other and with velar stops:

/ʔ/, /h/: /mąʔą́/ [mɪą́ɪʔɪą́ɪ] 'path', /mąhą́/ [mąhą́] 'wax'; /ʔi̱hí̱/ [ʔi̱hí̱] 'husband', /hi̱hí̱/ [hi̱hí̱] 'spider'.

/ʔ/, /hᵂ/: /ʔéhiʔi/ [ʔé·hɪiɪʔɪiɪ] 'he hooked himself', /hᵂéhiʔi/ [hᵂé·hɪiɪʔɪiɪ] 'it exploded'.

/ʔ/, /k'/: /ʔąká/ [ʔąʰká] 'variety of game bird', /k'ątí/ [k'ɪąʰtí] 'wild cane'.

/h/, /hᵂ/: /héhiʔi/ [hé·hɪiɪʔɪiɪ] 'he pulled ashore', /hᵂéhiʔi/ [hᵂé·hɪiɪʔɪiɪ] 'it exploded'.

/h/, /k/: /hí̱hi/ [hí̱hi] 'he is shooting', /kí̱hi/ [kí̱hi] 'he is advising'.

/hᵂ/, /kᵂ/: /hᵂéhi/ [hᵂé·hi] 'it is exploding', /kᵂéhi/ [kᵂé·hi] 'he is cutting'.

2. Consonant variants. Consonantal variation has a very small range, and the basic phonetic quality of the segment is usually maintained. Among the stops the greatest degree of variation occurs at the alveolar point of articulation. The simple stop /t/ is usually fronted and is interdental with some speakers. Aspirated and/or fortis variants

optionally occur. Simple stops are voiceless: /tát'í/ 'variety of turtle', [t̪ářɾ̥] fronted unaspirated, [t̪ʰářɾ̥] fronted aspirated, [t̪̋ářɾ̥] fronted fortis unaspirated, [t̪̋ʰářɾ̥] fronted fortis aspirated; /pété/ 'duck', [pét̪ʰé] fronted unaspirated, [pʰétʰ̪ʰé] fronted aspirated, [pét̪̋ʰé] fronted fortis unaspirated, [pʰétʰ̪̋ʰé] fronted fortis aspirated.

The glottalized counterpart of the alveolar stop is usually retroflexed, and voiced and/or lenis articulation is optional: /t'áíyï/ 'I am coming', [t̰'ɪáíyï] voiceless retroflexed, [t̰'ɪáíyï] voiceless retroflexed lenis, [d̰'ɪáíyï] voiced retroflexed, [d̰'ɪáíyï] voiced retroflexed lenis; /t'ó?t'óyï/ 'I am boring', [t̰'ɪó?+t̰'ɪóyï] voiceless retroflexed, [t̰'ɪó?+t̰'ɪóyï] voiceless retroflexed lenis, [d̰'ɪó?+d̰'ɪóyï] voiced retroflexed, [d̰'ɪó?+d̰'ɪóyï] voiced retroflexed lenis.

Voiced alveolar flap [ř] is a variant of /t'/ and occurs only intervocalic, or as onset of unstressed syllable following glottal stop. [t'] and other variants as shown above occur elsewhere: /hót'ó/ [hóřó] 'flower', /p'éót'u/ [p'ɪéóřu] 'all', /kí?t'ï/ [kíɪ?ᵊřï] 'more'.

The simple stops /p/, /k/, and /k^{w}/ have variants parallel to those of /t/ except for fronting: /píḱó/ 'smoke', [píḱʰkó] unaspirated, [pʰíḱʰkʰó] aspirated, [píḱ̋ʰkó] fortis unaspirated, [pʰíḱ̋ʰkʰó] fortis aspirated; /k^{w}á?kúk'o/ 'she

is boiling', [k^{w}á˥ʔ+kúk'˥o] unaspirated, [k^{wh}á˥ʔ+k^{h}úk'˥o] aspirated, [k̲^{w}á˥ʔ+k̲úk'˥o] fortis unaspirated, [k̲^{wh}á˥ʔ+k̲^{h}úk'˥o] fortis aspirated.

The glottalized stops /p'/, /k'/, and /k^{w}'/ have variants parallel to those of /t'/ except for retroflexion: /p'íʔp'ít'i/ 'variety of buzzard', [p'˥íˀ˥ʔ+p'˥íˀřˀi] voiceless, [p̲'˥íˀ˥ʔ+p̲'˥íˀřˀi] voiceless lenis, [b'˥íˀ˥ʔ+b'˥íˀřˀi] voiced, [b̲'˥íˀ˥ʔ+b̲'˥íˀřˀi] voiced lenis; /k'óʔk'óhi/ 'he is barking', [k'˥ó˥ʔ+k'˥óhi] voiceless, [k̲'˥ó˥ʔ+k̲'˥óhi] voiceless lenis, [g'˥ó˥ʔ+g'˥óhi] voiced, [g̲'˥ó˥ʔ+g̲'˥óhi] voiced lenis; /k^{w}'áóhi/ 'he is enclosing', [k^{w}'˥áóhi] voiceless, [k̲^{w}'˥áóhi] voiceless lenis, [g^{w}'˥áóhi] voiced, [g̲^{w}'˥áóhi] voiced lenis.

The feature of glottalization is very light, and the glottalized series can best be distinguished by the laryngealization which occurs on following vowels (see 4.).

[y] and [ñ] at the palatal position are allophones of the phoneme designated /y/. [ñ] occurs preceding nasalized vowels: /ʔíyé/ [ʔíyɛ́] 'tree grape', /ʔíyẹ́/ [ʔíñaẹ́] 'this', /yą́tá/ [ñą́^{h}tá] 'variety of large ant'. [y] occurs elsewhere and is characterized by light oral friction.

/w/ is nasalized [w̨] before a nasalized vowel: /wą́só/ [w̨ą́^{h}só˥l 'pole', /k'ą́wą́hi/ [k'˥ą́w̨ą́hi] 'it is flying'.

The phonemic status of glottal stop /ʔ/ is established by contrast between /yáí/ [yáí] 'tiger', and /yáʔí/

[yɪáɪʔɪíɪ] 'variety of vine'. It occurs word initial, intervocalic, and preconsonantal, with a different set of variants for each environment. Intervocalic glottal stop is audible and moderately released to the following vowel in slow speech forms, and in fast speech forms which constitute the peak of a phrase group. Laryngealization [ɪVɪʔɪV̰ɪ] occurs throughout the articulation of the adjacent vowels. Heavy stress /ˊ/ identifies the peak syllables of a phrase group: /wáʔí/ [wɪáɪʔɪíɪ] 'meat', /sɛ́sé wãʔĩt'e ʔą̃ĩʔį̃ĩ-h/[3] [saɛ́^{h}sɛ́ wɪã̃ɪʔɪĩɪ řɛ ʔɪą̃ĩɪʔɪį̃ĩ-h] 'I ate peccary meat'. When the fast speech form containing intervocalic glottal stop occurs in a nonpeak position of the phrase group, the glottal stop is lenis or disappears. Laryngealization is maintained on the adjacent vowels, and is carried over to the following vowels through intervening continuants and glottals /w/, /y/, /ʔ/, /h/, or /h^{W}/: /yĩʔĩ t'ĩ̃hõ̃t'e sãõ̃wĩ̃-h/ [yĩɪĩɪ t'ɪĩ̃hõ̃řɛ sãõ̃wĩ̃-h] 'I sent my wife', /k'į̃ʔį̃ wãʔtĩ̃t'e p'ãyĩ̃-h/ [k'ɪį̃ɪį̃ɪ wɪã̃ɪʔ+tĩ̃řɛ p'ɪã̃·yĩ̃-h] 'I have a comb'.

Preconsonantal glottal stop has variants: glottal stop plus internal open juncture [-ʔ+-], glottal stop plus light release [-ʔᵊ-], glottal stop plus fortis release [-ʔᵊ̰-]. Glottal stop plus internal open juncture occurs only before

[3] Final /-h/ and /-ʔ/ are features of pause-group phonology (see Footnote 2).

stops (except [ř], which is a variant of /t'/) and labial consonants: /pą́ʔpá/ [pą́ꜛʔ+pá] 'variety of palm tree', /wáʔtí/ [wáꜛʔ+tí] 'machete', /pḯʔkák'ï/ [pḯꜛʔ+kák'ꜛï] 'father', /t'óʔt'óyḯ/ [t'ꜛóꜛʔ+t'ꜛóyḯ] 'I am boring', /k'áʔwá/ [k'ꜛáꜛʔ+wá] 'wheel'. Glottal stop plus light release occurs only before /y/, /n/, and [ř]: /kḯʔt'o/ [kḯꜛʔᵊřo] 'home site', /wáʔną/ [wáꜛʔᵊną] 'creatures', /yíʔyó/ [yíꜛʔᵊyó] 'bead'. Glottal stop plus fortis release occurs only before sibilants and other glottals /s/, /s'/, /č/, /h/, and /h^{w}/: /wą́ʔsó/ [wą́ꜛʔᵊ̦só] 'variety of small agouti', /hóʔčá/ [hóꜛʔᵊ̦t͡šá] 'fermented manioc drink', /yáʔhí/ [yáꜛʔᵊ̦hí] 'variety of worm', /s'áʔs'á/ [s'ꜛáꜛʔᵊ̦s'ꜛá] 'variety of gnat'.

Word initial glottal stop varies freely from moderate to lenis articulation. In fast speech forms, word initial glottal stop is maintained in utterance medial position: /ʔókó/ [ʔó^{h}kó] 'water', /ʔáí p'á̋ʔï̋hi ʔó̋kó̋-ʔ/ [ʔáí p'ꜛá̋ꜛʔꜛï̋ꜛhi ʔó̋^{h}kó̋-ʔ] 'there is much water', /pó ʔą́őt'e yó̋ʔó̋k'ó-h/ [pó· ʔą́őřɛ yꜛó̋ꜛʔꜛó̋ꜛk'ꜛó-h] 'she is making manioc bread'.

All other consonants have only one allophone.

3. Vowel contrasts. Vowels contrast with each other at six phonemic tongue positions: front, central, and back, each with high and low counterparts, /i/, /e/, /ï/, /a/, /u/, /o/:

/i/, /e/: /píkó/ [pí^{h}kó] 'smoke', /pékó/ [pɛ́^{h}kó] 'maggot'.

/i/, /ɨ/: /wíhi/ [wí·hi] '(the grass) is growing', /wɨ́hi/ [wɨ́·hi] 'he is standing up'.

/e/, /a/: /t'éhi/ [t'ıɛ́·hi] 'it is hanging', /t'áhi/ [t'ıá·hi] 'he is bringing'.

/e/, /ɨ/: /yéké/ [yɛ́^{h}kɛ́] 'other (neuter)', /yékɨ́/ [yɛ́^{h}kɨ́] 'other (masculine)'.

/ɨ/, /a/: /sɨ́ók'o/ [sɨ́ók'ıo] 'she is toasting', /sáók'o/ [sáók'ıo] 'she is sending'.

/ɨ/, /u/: /sɨ́áyɨ/ [sɨ́áyɨ] 'I am tying up', /súáyɨ/ [súáyɨ] 'I am starting the fire'.

/ɨ/, /o/: /ʔɨ́kó/ [ʔɨ́^{h}kó] 'medicine', /ʔókó/ [ʔó^{h}kó] 'water'.

/a/, /o/: /kóká/ [kó^{h}ká] 'speech', /ʔókó/ [ʔó^{h}kó] 'water'.

/u/, /o/: /kúp'ɨ/ [kú·p'ıɨ] 'hill', /hóp'ɨ/ [hó·p'ıɨ] 'brain', /kóhé/ [kóhɛ́] 'hole'.

Each oral vowel has a contrasting nasalized counterpart:

/i/, /į/: /s'íʔs'íhi/ [s'ıíıʔə̩s'ıíhi] 'he is dirty', /s'įʔs'íhi/ [s'ıį́ıʔə̩s'ıíhi] 'he is washing (his face)'.

/e/, /ę/: /wékɨ́/ [wɛ́^{h}kɨ́] 'tapir', /wę́ká/ [wǽ̨^{h}ká] 'variety of bamboo'.

/ï/, /i̯/: /t'íĩhi/ [t'ɪíĩhi] 'he is submerging', /t'íĩhi̯/ [t'ɪíĩhi̯] 'he is bending double'.

/a/, /a̯/: /p'áhi/ [p'ɪá·hi] 'he has', /p'áhi̯/ [p'ɪá̯·hi̯] 'he is negative'.

/u/, /u̯/: /húhé/ [húhɛ́] 'variety of game turkey', /húhé̯/ [húhǽ] 'variety of small fish'.

/o/, /o̯/: /kówï/ [kó·wï] 'I received', /kó̯wï̯/ [kó̯·wï̯] 'I helped'.

4. Vowel variants. Oral vowels have the same tongue positions as their nasalized counterparts except for low front /e/, which has the value [ɛ], and /e̯/, which has the value [æ̯]: /té?ék'ï/ [tɪɛ́ɪ?ɪɛ́ɪk'ɪï] 'one', /sé̯sé/ [sæ̯^{h}sɛ́] 'peccary'.

A glottalized consonant causes laryngealization of the initial articulation of the following adjacent vowel [ɪV], or double vowel unit [ɪV$_1$V$_2$]: /p'o̯sá/ [p'ɪo̯^{h}sá] 'bixa', /k'ówï/ [k'ɪó·wï] 'soup', /s'é̯á̯yï̯/ [s'ɪæ̯á̯ñï̯] 'I am grabbing'.

Preconsonantal glottal stop causes laryngealization of the final articulation of the preceding vowel [Vɪ]: /wá?tí/ [wáɪ?ɪtí] 'machete', /hó?yá/ [hóɪ?ɪyá] 'domestic'.

Intervocalic glottal stop causes laryngealization throughout the adjacent vowels (see 2.).

All vowels have the following allophones conditioned by stress dynamics and following consonant: [V·] vowel plus

length and decrescendo occurs only on a stressed syllable immediately preceded by word juncture and immediately followed by unstressed syllable or word juncture: /wĩ́/ [wĩ́·] 'variety of agouti', /s'ɪ̨́ko?a/ [s'ɪɪ̨́·kɪoɪ?ɪaɪ] 'offspring (plural)', /sáyĩ́/ [sá·yĩ́] 'I am taking'. The vowel length and decrescendo is lost in fast speech forms outside the heavy-stress phrase-group peaks. [V^{h}] vowel plus voiceless offglide occurs only before a simple stop or simple sibilant when the following syllable is stressed: /?ápási/ [?á^{h}pási] 'variety of jungle fruit', /nąsó/ [ná^{h}só] 'variety of monkey', /mɪ̨́?ɪ̨́ nąkóni/ [mɪɪ̨́?ɪɪ̨́ ná^{h}kóni] 'with you'. [V] simple vowel occurs elsewhere: /kút'á/ [kúřá] 'chicken', /yékɪ́ko?a/ [yɛ́^{h}kɪ́kɪoɪ?ɪaɪ] 'others', /mɛ́hą́/ [mąɛ́há] 'sand'.

5. Stress. Phonemic stress is present in two degrees within the word, which is defined as the minimum elicitable form or such a minimum form expanded by following unstressed syllables. Although no very good minimal contrasts have been found, stress is a conditioning factor for variations in other phonemes (see 2. under /t'/, and 4. under vowel allophones conditioned by stress).

Basic stress patterns include: (1) Stress on word initial syllable followed by unstressed syllable or word juncture: /t'ő/ [t'ɪó·] 'just that and nothing more', /yők'u/ [yó·k'ɪu]

'canoe', /nę́hi̯/ [nę́·hi̯] 'he is catching'. (2) Double-syllable stress: /ʔę́ká/ [ʔę́^{h}ká] 'firewood', /súsí/ [sú^{h}sí] 'variety of nettle plant', /t'úʔt'ú/ [t'ɪúɪʔ+t'ɪú] 'first', /yáʔí/ [yɪáɪʔɪíɪ] 'variety of vine', /yúyú/ [yúyú] 'termite', /yúyúp'ï/ [yúyúp'ɪï] 'termite nest'. (3) Double-syllable non-stress in limited occurrence: /mi̯ʔi̯/ [mɪi̯ɪʔɪi̯ɪ] 'you', /yï̯ʔï̯/ [yɪï̯ɪʔɪï̯ɪ] 'I'.

Heavy stress /ˊ/ occurs as a feature of phrase-group rhythm dynamics, not discussed in detail here (see 2. under glottal stop).

6. Syllable types. The contrasting phonemic syllable types are:

/CV/: /sáyák'o/ [sáyák'ɪo] 'she is putting it on herself'. /CV$_1$V$_2$/: /sáík'o/ [sáík'ɪo] 'she is going'. /CVʔ/: /sáʔpík'o/ [sáɪʔ+pík'ɪo] 'she is mixing'.

/CV$_1$V$_2$/ has one basic phonetic manifestation, consisting of consonant onset plus two unlike vowels [CV$_1$V$_2$]. Certain phonetic cues indicate that this sequence of vowels comprises a single syllable and not two. The two vowels are articulated together as a combined unit, the timing of the whole is equivalent to that of a single stressed vowel phoneme, and there is no rearticulation of the second vowel. One peak of stress occurs on both vowels with a slight rise in pitch. Laryn-

gealization conditioned by preceding glottalized consonant carries through the initial articulation of the double vowel set, and is not limited to the initial articulation of the first vowel (see 2.). /k'áó/ [k'ɪáó] 'variety of buzzard', /tóá/ [tóá] 'fire', /ʔą́ǫ́k'a/ [ʔą́ǫ́k'ɪa] 'manioc bread', /sáíyï/ [sáíyï] 'I am going', /p'éóhi/ [p'ɪéóhi] 'there is not any', /háĩ̈ʔï/ [hɪáĩ̈ɪʔɪï̈ɪ] 'affirmative response'.

/CV/ has three basic phonetic variants: (1) Consonant onset plus simple vowel peak plus voiceless offglide [CV^{h}]: /ʔą́ká/ [ʔą́^{h}ká] 'variety of game fowl', /kókéhi/ [kó^{h}kéhi] 'he is deceiving', /túťú/ [tú^{h}tú] 'wind', /sę́sé/ [są́^{h}sé] 'peccary', /ʔú̧k^{w}éhi/ [ʔú̧^{h}k^{w}éhi] 'he is dissolving in the mouth'; (2) Consonant onset plus simple vowel peak plus length and decrescendo [CV·]: /t'áya̧/ [t'ɪá·ña̧] 'hairs', /kówï/ [kó·wï] 'claw', /k'á/ [k'ɪá·] 'variety of black bird'; (3) Consonant onset plus simple vowel peak [CV]: /hóhó/ [hóhó] 'frog', /kúť'ắ/ [kúřắ] 'chicken', /táyá/ [táyá] 'grass', /k'ĩ́ną́/ [k'ɪĩ́ną́] 'metal', /hą́mǫ́/ [hą́mǫ́] 'armadillo', /p'ĩ́ʔĩ́/ [p'ɪĩ́ɪʔɪĩ́ɪ] 'crocodile'.

These three phonetic manifestations represent one phonemic syllable type because of the phonemic interpretation of vowel variants [V], [V^{h}], and [V·] (see 4.).

/CVʔ/ has three basic phonetic variants: (1) Consonant onset plus simple vowel peak with coda of glottal stop plus

internal open juncture [CV?+]: /pą́?pá/ [pą́ı?+pá] 'variety of palm tree', /wá?tʃ/ [wáı?+tʃ] 'machete', /pĭ?kák'ĭ/ [pĭı?+kák'ıĭ] 'father', /t'ó?t'óyĭ/ [t'ıóı?+t'ıóyĭ] 'I am boring', /k'á?wá/ [k'ıáı?+wá] 'wheel'; (2) Consonant onset plus simple vowel peak with coda of glottal stop plus light release [CV?ᵊ]· /kĭ?t'o/ [kĭı?ᵊr̆o] 'home site', /wá?nạ/ [wáı?ᵊnạ] 'creatures', /yĭ?yó/ [yĭı?ᵊyó] 'bead'; (3) Consonant onset plus simple vowel peak with coda of glottal stop plus heavy release [CV?ᵊ̦]: /wą́?só/ [wą́ı?ᵊ̦só] 'variety of small agouti', /hó?čá/ [hóı?ᵊ̦tʃ̦á] 'fermented manioc drink', /yá?hĭ/ [yáı?ᵊ̦hĭ] 'variety of worm'.

These three phonetic manifestations represent one phonemic syllable type, because of the phonemic interpretation of preconsonantal glottal-stop variants [?+], [?ᵊ], and [?ᵊ̦] (see 2.).

The onset of each syllable type includes some consonant phonemes which consist of more than one phonetic segment: /č/ [tʃ̦]: /čóĭhi/ [tʃ̦óĭhi] 'he is calling out', /čá?káhi/ [tʃ̦áı?+káhi] 'he is jumping'; /k^{W}/ [k^{W}]: /k^{W}ę́yę́/ [k^{W}ą́ñą́] 'near', /k^{W}á?kṵk'o/ [k^{W}áı?+kúk'ıo] 'she is boiling'; /k^{W}'/ [k^{W}']: /k^{W}'áóhi/ [k^{W}'ıáóhi] 'he is enclosing'; /h^{W}/ [h^{W}]: /h^{W}ę́?h^{W}ę́/ [h^{W}ą́ı?ᵊ̦h^{W}ą́] 'convulsions'. The interpretation of each phonetically complex onset as a single consonant phoneme is based on the fact that their short duration is no

greater than that of single consonant phones in this environment, and on structural pressure. Nonsuspect sequences of consonants do not occur syllable initial, nor do sequences of three vowels, or of two vowels plus glottal stop, occur. These restrictions, along with the fact that [^{w}], as a feature of the simultaneous consonant articulation, has a much shorter duration than a vowel in syllable-peak position, force the interpretation of [k^{w}], [k$^{w'}$], and [h^{w}] as single unit phonemes.

Restrictions as to distribution of these three phonemic syllable types in the word matrix are: (1) the minimum elicitable form may consist only of /CV$_1$V$_2$/ and the [CV·] variant of the /CV/ type, without being followed by one or more syllables, and (2) the [CV^{h}] variant of /CV/ and the /CV?/ syllable type never occur word finally in the middle of a pause group.