PHONOLOGY OF SAN MARTIN QUECHUA

Douglas William Howkins

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PHONOLOGY

OF

SAN MARTIN QUECHUA

Douglas Howkins

Ph.D. Thesis.
FOREWORD

Most modern linguistic descriptions of Quechua dialects in circulation at present have concentrated on aspects of morphology. Traditional grammars have aimed at rather wider coverage of particular dialects. Middenforf\(^1\), in his grammar, deals fairly extensively with phonetics, word-formation (roughly, morphology) and sentence-formation (roughly, syntax), in Cuzco Quechua. In phonology (and in syntax, too, though this aspect is not under discussion here), modern linguistic approaches to Quechua have given only very modest descriptions. This is all the more surprising given the advances made all over the world in the last fifty or so years in phonological theory.

It is difficult to specify exactly why phonology has been treated in this rather summary fashion. Partly, this may be a result of particular linguists' interest in morphology (with an 'agglutinating' language like Quechua, for many this will be its most fascinating aspect). Partly, it may be a result of a trend of thought which does not believe phonology to be a subject worthy of independent investigation. Phonology, within the sphere of reference under discussion here, has been regarded as no more than a subsidiary to grammar. There is only one work in existence (excepting the present one) which concentrates exclusively on

\(^1\)Gramática Keshua (1892), transl. E. More, 1970, Lima, Peru.
Quechua phonology.

Cuatro Fonologías Quechuas is an essay into phonology in its own right, performed by four linguists of Bloomfieldian theoretical bias. Unfortunately, it cannot be said to be an exhaustive treatment, four dialects of Quechua (Picoy, Wanka, Caraz, Yanacocha) being described in its eighty pages of text.

The four descriptions which together constitute the book follow a fairly uniform theoretical framework. The phoneme inventory is stated; the phonemes and their allophones are stated; syllabic structure and the distribution of phonemes are described with reference to the syllabic 'model' described in IV of the present work; no phonetic nor phonological text is included apart from one or two forms used to illustrate each phoneme. The author’s major criticism of these descriptions is of their lack of adequate explanation of descriptive procedures and problems.

Other modern linguistic treatments of Quechua phonology have limited themselves to providing a preliminary to morphology (or rarely, to syntax). Parker (on Ayacucho Quechua, 1965), gives only eleven pages on phonology; Lastra (on Cochabamba Quechua, 1968) gives some fifteen pages; Solá (on Huánuco Quechua, 1967), and

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1 This work was prepared under the "Plan de Fomento Lingüístico" of the University of San Marcos, Lima, in 1967. The contributors are G.J. Parker (Caraz), R. Cerrón (Wanka), A. Escobar (Yanacocha), and J. Creider (Picoy).

2 This is not a complete coincidence. Solá and Parker (bringing the theory of Hockett from the United States) have exerted a great deal of influence in the project in question.
Proulx/Escribens (on Huaylas Quechua, 1971) follow the same plan, giving only short accounts of phonology as a preliminary to grammar. There is very little literature on Quechua phonology which can assist the linguist who wishes to gain a detailed knowledge of phonology in any dialect of Quechua. The most extreme case of brevity in the treatment of phonology is the work called Bolivian Indian Grammars, which gives the phoneme inventory in a footnote on the first page of the description. It is fair to say that linguists have only scratched the surface of Quechua phonology in the dialects which they have studied.

While the present work is far from being a 'definitive' one, it does aim at providing a fairly complete phonology of San Martín Quechua. The author has tried to give a satisfactory account of the descriptive problems and their possible solutions for the dialect. The theoretical principles used to solve the problems are explained, the notions of the theory are defined, and their application to the data is outlined in every case, and explained in some detail in many cases as well.

This work is unusual among works on Quechua as regards the space it devotes to explaining and solving problems in the description. Existing descriptions of Quechua may be characterised as

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1 Summer Institute of Linguistics publication, Riberalta, Bolivia, 1965.

2 It is difficult to specify the proportion of dialects which have been studied; Ecuador and Bolivia are largely untouched, while many areas of southern Peru have yet to be investigated.
supposedly problem-less descriptions. The present work treats phonology, not as a subsidiary to grammar\(^1\), but as a universe in its own right, with its own problems and solutions. The 'European' background of the work, and the 'axiomatic' approach of Mulder, have undoubtedly contributed in great measure to the nature of this description, and to what some might call its 'preoccupation' with problems. Without wishing to tag derogatory labels on Bloomfieldian linguistics (enough writers have done so already), I have written the present work as a possible answer to what I believe to be an inadmissible 'gap' in Quechua linguistic description as it stands - the lack of a rigorous autonomous phonology, which attempts to recognise, state and solve descriptive problems. It is to be hoped that the present work provides a beginning for a fully-fledged discipline of Quechua phonology.

\(^1\)This is not to say that the phonological statement which follows has no relevance for grammar. On the contrary, it is vital for stating the phonological form of allomorphs in San Martin Quechua.
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Map 1

The Northern Departments (PERU).
Map 11

The Department of San Martín.
Map III

Dialect Zones To Which Reference Is Made In The Present Description.

1. Napo
2. San Martín
3. Cajamarca
4. Huaylas
5. Huánuco
6. Huancayo (Wanka)
7. Ayacucho
8. Cuzco
9. Cochabamba
To my knowledge, the word 'Quechua' does not figure in the language spoken by the Indians of San Martín. The term 'Quechua' is used only by mestizos\(^\text{1}\) to refer to the language of the Indian. The Indians call their language \([\text{Zákwa}]\), which may be given the orthographical form 'Zhakwash'.

The form \([\text{Zákwa}]\) appears to be related diachronically to the form \([\text{Zákwa}]\), meaning "lick", therefore there do not appear to be any grounds for doubting that it is a bona fide Indian word.

If we accept the view of Middendorf\(^\text{2}\), we must regard 'Quechua' as a loan word (from the Indian language of some region of Peru) in Spanish. Originally, 'quechua' meant "a highland region". The use of this term to apply to the Indian language is more than likely a late scholastic innovation in Spanish.

There are grounds for supposing that it would be more accurate to call my description 'Zhakwash Phonology' than 'San Martín Quechua Phonology' - however, convention among Andean linguists has laid down that the term 'Quechua' be used to refer to all varieties of this language. Throughout the thesis, I shall follow this convention and will use the term 'Quechua'.

\(^{1}\) The term 'mestizo' in this work has no anthropological implications. It is defined as 'speaker whose \text{first} language is Spanish'.

\(^{2}\) Gramática Keshua. See p3 for discussion of the term 'quechua'.
The linguistic data described in this thesis were collected on two field-trips to the Department of San Martín, Peru (see Maps 1 and 11). The first of these two field-trips was made by myself to the town of Lamas, during the summer months (May-September) of 1969. During this trip, some recording of Lamas Quechua was done, the basic vocabulary was elicited from the informants, and I made some progress in conversing with native Quechua speakers.

The second field-trip was made in the months of June-July-August of 1971, in the company of my wife, Angela. On this occasion, the centre chosen was the town of Sisa, some fifteen miles from Lamas. The body of data collected in Sisa was of the order of twenty-five to thirty thousand words of continuous narration which, with the advantage of knowledge acquired in 1969 in Lamas, I was able to transcribe and check with the informants in Sisa. The data collected in Sisa forms the core of the total body of data used for the description.

The data consists of thirty-five stories, four lengthy accounts of the life and history of Sisa, and a fair amount of random recorded conversation. These texts are rich in vocabulary; the topics relate to many aspects of the Quechua Indian's environment and culture. For the rest, it must be left to the description to state the 'nature' of the data.
ACKNOWLEDGEMENTS

My translation and transcription of the recorded text was checked in Sisa with the help of Don Victor Cenepo, a native of Chazuta. Don Victor is a mestizo with near native mastery of Quechua. I am greatly indebted to him for his patience throughout this difficult task.

I am also indebted to Miss Marinell Park, of the Summer Institute of Linguistics, who has been working on Sisa Quechua for several years. Miss Park introduced me to the informants in Sisa, and furnished me with extensive notes from her preliminary draft of a pedagogical grammar of the dialect.

My thanks go to Mañuel Vela and Genaro Salas, who were my first informants in Lamas in 1969. In Sisa, I must mention the invaluable help afforded me by Don Benigno Tapullima who, though bed-ridden as a result of an accident he suffered some twenty-three years ago, enthusiastically told some twenty-five very interesting, and often amusing, stories.

My work has benefitted immeasurably since its inception in 1968 from the help given to me by my supervisor Jan. W.F. Mulder, of the Department of Linguistics, St. Andrews. His 'axiomatic' theory of phonology provides the theoretical foundation of the work. I hope that I have succeeded in providing a worthy application
of his theory in this work which, to my knowledge, is the first true 'functionalist' description of any aspect of Quechua.

My thanks go to Sándor G.J. Hervey, of the Department of Linguistics, who always made himself available to discuss the problems involved in the description.

Others who were concerned with the work in its very early stages include Mr. D.J. Gifford and Mr. L. Hoggarth of the Centre for Latin American Linguistic Studies, St. Andrews. It was Mr. Hoggarth who, in 1967, when he delivered a one-year course of lectures on Cuzco Quechua for the Department of Spanish, first aroused my interest in the Quechua language.

My last acknowledgement is to my wife, who accompanied me to Sisa.
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San Martín Quechua


" : Rinchi Puricuc(Summer Institute of Linguistics
Publication), Lima, 1971.


The number of works on Quechua referred to is sufficiently limited for me to refer to a given work by way of the author's name and its date of publication. For example, I will refer to 'Parker (1965)', by which is to be understood the second work of Parker cited above.
NOTATION/SYMBOLS

I have tried to use as few symbols as possible in this description. One or two symbols, the use of which proved unavoidable, are listed here:

\~ : 'is functionally opposed to'
X : 'is in combinatory variance with'
\& : 'is in free variance with'
syllabic boundary
/\textit{abc}/ : phonological form
[\textit{abc}] : phonetic form
/\textit{A}/ : archiphonesme
\textit{\{a, b, c\}} : a class

For the rest, any abbreviations used in the course of the description are explained at the appropriate point in the thesis.

The symbolization of the logic of classes is assumed throughout. The symbolization used here is comparable to that of Sets, 11;(p96).


\footnote{For facility in typing, I use the mark ' учитываю' for 'open', as in [\textit{a}]. Similarly, I use [\textit{r}] for 'flap', and [\textit{F}] for 'rolled'. There is very little use of symbols without accompanying explanation in phonetic terms, therefore I do not anticipate any confusion.}
"Description is the application of a theory to a select class of phenomena."

J.W.F. MULDER

"...By the immediate feeling of conviction which it conveys, we can distinguish the true statement, the one whose terms agree with experience, from the false statement, whose terms do not agree with it. Science is merely an attempt to classify and describe this perceptual knowledge, these immediate experiences whose truth we cannot doubt; it is the systematic presentation of our immediate convictions. This doctrine founders on the problems of induction and of universals. For we can utter no scientific statement that does not go far beyond what can be known with certainty 'on the basis of immediate experience'. (This fact may be referred to as the 'transcendence inherent in any description'.) Every description uses universal names (or symbols, or ideas); every statement has the character of a theory, of a hypothesis."

KARL POPPER
1

METHODOLOGY

1. Methodology of Existing Descriptions of Quechua.

It is only comparatively recently that scholars have begun to use modern linguistic approaches to the description of the Quechua language. However, in spite of ever-increasing activity on the part of the universities of the United States in the matter of bringing to bear on Quechua the results of theoretical linguistic research, it is fair to say that the greater part of the work published to date on Quechua has been done in accordance with the principles of traditional grammar. The relative merits of traditional grammar and modern linguistics are not under discussion here. My work is directed to those who are involved in bringing the results of modern theoretical linguistics to bear on the problems encountered in the linguistic description of Quechua.

The modern theories which have been used to date in describing the Quechua language have been mainly those formulated by American linguists. In particular, the theories of Bloomfieldian and neo-Bloomfieldian linguists such as Hockett have exerted influence on several linguistic descriptions of Quechua. Such is the magnitude of the American output in descriptive Amerindian linguistics that one could be forgiven for supposing that there is little room left

\[1\]

By 'Bloomfieldian linguists', I refer to those linguists who adhere to views deriving from Bloomfield's *Language*. See *Sets*, pl-7.
for new research in this field. While fully recognising the achievements of American scholars in Amerindian linguistics, more particularly in Quechua linguistics, I make no apologies for presenting the present work, which sets out from a stand-point very different from the 'American' one, and which, I believe, highlights several problems hitherto left unaccounted for by existing descriptions of Quechua. The present work cannot be viewed in the same light as previous work on Quechua, because the philosophical base upon which it rests is quite different from that used in any previous work on Quechua.

American linguists (I exclude those who adhere to theories of transformational phonology and grammar) have invariably sought after objectivity in their descriptions of particular languages. This is a characteristic of the inductive method, used by nearly all those linguists who have written about Quechua. Karl Popper gives the following characterisation of this method:

"It is usual to call an inference 'inductive' if it passes from singular statements..., such as accounts of the results of observations or experiments, to universal statements, such as hypotheses or theories."

Roughly speaking, in an inductive description of a language, the linguist collects data and, by enumerative (and purposely objective)

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1 Objectivity in the inductivist sense is held to be achieved by (proposed) impartial observation of data. While the 'European' view also seeks after objectivity, it seeks to achieve this by attempting to account for the data by way of a theory.

2 Logic, p27.
reflection on those data, premises a hypothesis which he claims to represent the pattern which he finds (by observation) in those data. This is my characterisation of this approach. An inductivist would state that, by impartial observation of or by enumerative reflection upon the data, the patterns which exist in the language may be discovered and stated in the description. Inductivists have been very explicit about their faith that in languages there are patterns which can be discovered. Furthermore, they have even suggested that an unequivocal statement of the patterns can be reached. For example, take the following view of Gleason:

"In any language, there is a definite and usually small number of phonemes. English has forty-six."

Hockett, who has supervised a considerable amount of modern linguistic work on Quechua, is equally explicit about his faith in the inductive method:

"Linguistic research can achieve nothing unless it is strictly inductive."

The belief that one can proceed from particular observations to general or universal statements (such statements as the 'phonemes of Quechua' or the 'syntactic structure of Quechua') has prevailed in Quechua linguistic studies, not to say in the whole of Amerindian linguistics.

2. The Deductive Method of Testing.

The present description begins from a stand-point which doubts

1. Introduction, p9.
2. Course, p7.
the absolute objectivity of 'facts'. The stand-point adopted here is that there is a gap between phenomenon and statement which may not be removed, no matter how much we seek after objectivity (in the inductivist sense). There is no way, in this view, by which mere observation of or enumerative reflection upon phenomena can lead to an unequivocal statement of their nature. On this point, I quote once more Karl Popper, who is one of the leading advocates of the view adopted here on the nature of statements:

"Thus not only the more abstract explanatory theories transcend experience, but even the most ordinary singular statements. For even ordinary singular statements are always interpretations of the 'facts' in the light of theories." ¹

It is not possible to reconcile this point of view with that adopted by those who favour inductive methods. This is because this view denies precisely what the inductive method bases itself upon i.e. the absolute objectivity of 'facts'. The inductive method holds that facts are in the data to be discovered; the present approach holds that 'facts' are interpretations of the data in question in the light of theories.

In our view, there may be several different statements of the 'facts', each of which is a true statement in terms of the theory used to produce that statement. This is not tantamount to suggesting that, in this view, one is permitted to devise hypotheses in an

¹ *Logic*, p423.
indiscriminate way, or to suggesting that all points of view are equally valid. These are two widely held misconceptions about methodologies which recognise the approach to 'facts' by way of theories. The fact that Popper's view is fundamental does not imply that there the problems of description end. While recognising that, in description, we are making statements which purport to apply to phenomena, and that these statements are produced by theories of greater or lesser precision, we must also recognise that there is a way by which to judge the effectiveness of one statement against that of another. The view that one statement is the equal of any other is only possible if we adopt a wholly uncritical attitude to description and to particular descriptions.

In my work, I place great emphasis on the views propounded by Popper in his logic of scientific discovery. Descriptive statements have the character of hypotheses, which must be tested in the light of their consistency one with another, and which must be confronted with any hitherto unknown or unaccounted for(by the statement) data, which may be presented in the form of a statement in a refuting hypothesis. If a hypothesis can be shown to fail in either of these two tests, it must be considered refuted. In producing the present set of statements(i.e. the present description), I submitted all my statements to this procedure called testing. Many were refuted, often because of a relatively minor illogicality. The set of descriptive statements presented in the thesis are those which have
proved their mettle in resisting 'attempted refutations'. This epistemological point of view has been called by Popper the deductive method of testing. The demand that hypotheses be submitted to tests means that one should not present whatever hypothesis comes to mind, but that hypotheses should be carefully formulated in terms of a rigorous theory, and then tested. Only if these two steps are taken (and if the statement proves its mettle), may a given statement be said to be corroborated.

3. Theory and the Testability of Statements.

We arrive at descriptive hypotheses by applying the theory of our choice to protocolized phenomena, which are our data. As Mulder says, "description" is:

"...the application of a theory to a select class of phenomena."³

The theory used in the present description of 'bilingual data' is Mulder's 'axiomatic theory', as formulated in Sets.

In relation to the demand that hypotheses be tested, it is, of course, a requirement that any hypothesis be in principle testable. This is in no way an afterthought, but lies at the very heart of the deductive method of testing. The statements which constitute a given description, in this view, must fulfil the following

---

¹ *Logic*, p30.
³ *Sets*, p7.
⁴ For 'bilingual data', see my page 42.
requirements a and b:

a. They must be clearly understandable in terms of a theory.

b. They must be testable for consistency and adequacy.

Here, a implies b. If a statement is clearly understandable in terms of a theory, then it will be testable as a matter of course. In order that conditions a and b be fulfilled, it is essential that the statements which constitute the description be explained in terms of the theory which is used to produce them. It results from these considerations that the definition of the theoretical 'models' used to produce a given description is a sine qua non, both as far as our own statements are concerned, and as far as our testing of the statements made by other linguists is concerned.

Definition is not a requirement for those who adopt the inductive method in linguistic description, for they hold that the 'facts' of language are self-evident, not to say indisputable. Once more, we are brought face to face with the problem of the diametrically opposed philosophical bases of the inductive method and the deductive method of testing. The philosophical principles of inductivism do not lead to statements which fulfil the requirements a and b (above). As a result of the view that one does not need a theory in order to state 'patterns' in languages, it is rare indeed to find a description of this kind formulated in terms of a unified theoretical point of view. The fact that the....
inductive statement is not easily testable does not make its position any more secure than that of a statement which is formulated in such a clear manner that it is in principle testable and, therefore, refutable. On the contrary, the real problem for an inductive statement is that, in the absence of any definition of the theory used to produce a statement, that statement is theoretically open to almost any interpretation whatever. If a statement leaves one in doubt as to what it actually means, the explanatory power of that statement is bound to be greatly reduced.

Without definition, a statement is vague and ambiguous. As such a statement is not in principle testable, we have no way of finding out which of two inductive statements is the more consistent and adequate. Again, this results in a loss of explanatory power as far as both the statements in question are concerned.

The inductive statement does lead one easily to the conclusion that all statements are equally acceptable - if statements are not defined, it is very difficult to argue with this conclusion. One can also arrive, however, at the conclusion that all statements made in a vague and imprecise way are equally unacceptable. This is the case, quite simply, because, if statements are not in principle testable (and vague statements are scarcely ever testable), we have no way of knowing whether an advance has been achieved by a particular statement or not. One of my goals in this work is to produce a description which has a high degree of explanatory power.
I am not satisfied that the inductive method can achieve such a description. Here, I have confined myself to the descriptive weaknesses of the inductive method. On the question of the logical problems facing that method, I refer the reader to Popper, who has given what I believe to be a successful refutation of inductivism.¹

The criterion of explanatory power and the related criterion of adequacy have been emphasised by surprisingly few linguists. 'American' linguists, in particular, do not appear to consider this a point worthy of emphasis. This is probably a result of the view that patterns are self-evident in particular languages. Given this view, it is not too difficult to see why 'American' linguists may be led to take 'explanatory power' for granted for their descriptions of particular languages. The question of the explanatory role of the descriptivist is well put by Lyons²:

"The second requirement is one of material adequacy. Those terms used in the theory which have been taken over from traditional theories of semantics or from ordinary language ('meaning', 'denotation', 'synonymous' etc.) are not to be applied arbitrarily; their application and definition must satisfy certain external criteria. For the linguist's task is to some extent one of explication."

Here, Lyons refers to what are often assumed to be primitive terms in a linguistic description. Given that it is highly debateable

¹*Logic*, p27-40.
²*Structural Semantics*, p5.
whether a given term is primitive or not, it is preferable to make our explanation of the models in the theory (and of their application in the description) as clear as possible, in order to avoid any ambiguity which will ultimately reduce the explanatory power of the statement. In addition, any further terms, as Lyons points out, must be defined and explained. What Lyons refers to as "external conditions" can be specified for the present work in the conditions whereby a statement is made testable. Definition and explanation of the theory and of the statements made in terms of the theory are given in order that the descriptive statements be rendered understandable and testable. Though Lyons does not use the deductive method of testing, his work is one of the few to emphasise explicitly the role of definition in determining the explanatory power of statements.

It is not my purpose here to explore all the aspects of the disparity between inductive and deductive approaches to linguistic description. Beyond a certain point, this is a problem best left to logicians. I believe, however, that often it has gone unnoticed that these two kinds of linguistic description exist and that, more important still, they are completely different.

As I said before, under the view adopted here, we arrive at a descriptive hypothesis about particular data by applying a theory.

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1 I do not mean to give the impression that any linguistic methodology is either inductive or deductive. For discussion of other possible approaches, see Sets, 1-7.
to our data. The 'axiomatic' theory of J.W.F. Mulder has, I believe, qualities unsurpassed by any other 'structuralist' theory of phonology formulated to date. My use of the term 'structuralist' has none of the connotations given to that term by transformational grammarians and phonologists. In fact, I use the term precisely in order to distinguish what I(and other 'functionalists')mean by 'explanatory power' from what is meant by transformationalists when they use that term. No attempt is made here to explain our 'linguistic competence'. In this respect, it is worth emphasising the fact that the present theory is 'structuralist'(as is the description, too, of course).

4. Data and Descriptive Adequacy.

For a complete description of a language, it is necessary to apply the theory in its most complete form to anything that may count as data under the terms of that theory. It is, of course, imperative to have access to an as large as possible body of data in order to come to a satisfactory statement.

It is very difficult to measure data in a quantitative way. It is preferable to cast the onus on to the description to 'prove' (test) the data. It is not really possible to consider the data apart from some kind of description of those data. We can list

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1A particularly emotional attack on 'structural' phonology is to be found in Postal, Aspects of Phonological Theory.

2See Sets, p20.

3For example, the difference between male and female voice pitch does not count as data under the theory.
data, or count the number of instances of a given form in the data, but even this constitutes a crude description of those data. If we wish to approach the question of data, we can do this in an indirect way by means of the criterion of descriptive adequacy.

It is not possible to produce an adequate set of statements about a language on the basis of insufficient data. One of the reasons why a statement may be refuted is that it applies to some data (let us say the data which one has), but that it does not account for some other data (the data which do not figure in the text, or the data which have been overlooked, either by accident or in order to protect the statement). If a refuting hypothesis is devised which shows that the statement in question claims to have accounted for certain data, but has not, in fact, accounted for those data, this constitutes a successful refutation. The description will have been shown to be inadequate. The 'adequacy' of a set of statements, under Mulder's view\(^1\), equals the scope within which attempted refutations are un-successful. Therefore, we may say that, as successful refutations increase, the adequacy of a statement decreases. A statement which accounts for only a part of all relevant data will be refuted very quickly. The above point of view not only makes any defence of the data in terms of quantity unnecessary, but renders it rather futile. There is no strict guarantee that a vast amount of data will enable us to produce

\(^1\) Sets, p20.
an adequate statement, but it is more than likely that a very small body of data will be insufficient. What is certain is that deficiencies in the data become known only after description has begun.

As soon as a description is made, it is held to apply, not only to actual data, but to any data which may be found in the future. The failure of the descriptive statement to account for data which, for some reason, are unknown or have been overlooked will, if acted upon, result in a refutation of the existing description, and a new one will have to be formulated in the light of those data which have been left unaccounted for by the description.¹

In this thesis, I do not explain all the implications of an axiomatic approach to phonology, for that is clearly beyond the scope of a work of this kind. However, the description is formulated in such a way that it can be understood in terms of the theory, and is, therefore, in principle testable for consistency and adequacy. This has entailed a certain degree of explanation of the theory in abstracto but, where possible, I have explained the theory in its application to San Martín Quechua.

5. Consistency and Adequacy.

Mulder explains that:—

"The three main requirements for a good theory are

¹This contingency does not constitute a refutation of the theory. A theory is refuted when it is shown to be internally inconsistent, or inapplicable to certain data."
consistency, adequacy and simplicity."\(^1\)

Given that 'description' is the result of applying a theory to data, it follows that a particular description is required to meet the same three conditions as stated above. **Simplicity** is the least important of the criteria. It assumes its greatest significance when we arrive at two statements which we judge to be equally consistent and adequate. Of two such statements, we shall always opt for that statement which is the **simpler** of the two. In my view, the **simpler** of two statements is the statement which is the more **easily testable**.\(^2\)

In connection with particular descriptions, it is important to remember that 'gaps' (i.e. data left unaccounted for) should not be met by the ingenious invention of new criteria, in order that the gaps be removed at all costs. If it is found to be quite impossible to account for some data, it is preferable to maintain the consistency of that part of the description which is possible, rather than to introduce new criteria which, while they account for a 'gap', may well affect the consistency and adequacy of the total set of statements. This point has been put succinctly by Haas\(^3\), who makes a telling criticism of American linguists in the cited article:

"There are various methods of filling gaps. One is the eclectic method. It consists in freely multiplying and

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\(^1\) *Sets*, p20.

\(^2\) See *Logic*, p 136-45, and my page 84.

\(^3\) "*Linguistic Structures*", p253.
and mixing principles of analysis. Whenever one approach is found wanting, another is adopted... This is a way of securing empirical completeness at the expense of consistency."

Therefore, if anything, completeness in the description is a secondary requirement, in the sense that, if we are forced to make a choice between a and b (below):

a. We account for a great part of the data in a consistent and adequate way, but leave some data undescribed.

b. We devise new criteria in order to account for that small (we assume) section of data left undescribed in a.

we should always opt for a i.e. we should sacrifice adequacy at the margins of the description rather than risk distorting the consistency of the total description by attempting to account for all the data by which ever means we find available to us. This view is in perfect agreement with Martinet's classic principle that the linguist should not allow marginal elements to figure in the description if their inclusion means that the central parts of the description are weakened. In addition, the observation of this principle nearly always means that we produce a simpler (more easily testable) statement than we do if we "multiply and mix principles of analysis". More will be said about 'simplicity' and 'testability' in V, 3.

1 Such descriptions are usually very difficult to test. This fact alone lowers their status under our view, even forgetting the inconsistencies likely to come about.

2 "Realism versus Formalism", p20.
6. Protocolized Data.

I believe that a fairly large amount of protocolized data\(^1\) should be made accessible in the description. I have reached this point of view as a result of my having spent many hours trying to test existing statements purporting to apply to Quechua. I am far from convinced that a statement of the 'facts' in terms of a theory (even if this theory is carefully explained) should be given completely apart from the data to which that statement is held to apply.

The present description contains a good deal of exemplification by way of phonetic form, in order that the reader can appreciate to what and how a statement applies in the description. The work comes to a close with a selection of sample texts in phonological form — these enable the reader to understand the implications of describing the form level of Quechua in a 'functionalist' way.

There are good practical reasons for adopting this attitude as far as the description of Quechua is concerned, because relatively little is known in Europe about this language. Therefore, considerable exemplification in the form of phonetic and phonological form(s) is included to make the description more readily understandable and testable.

The present work is intended purely as a contribution to Quechua linguistic description, within the field of Amerindian linguistics as

\(^1\)Sets, p20.
a whole, and is in no way intended as a contribution to theoretical linguistics. Nearly all the theoretical points made in this thesis are to be found elsewhere (though not applied to the particular problems tackled here), mainly in Mulder's *Sets*, and in Popper's *Logic*.

There is always the possibility that a slight misinterpretation of these views is present and, if and when this occurs in what follows, it must be attributed directly to the author of the present description of Quechua. Criticism of any such eventuality should be tempered by the realisation that the author is an Amerindian scholar with a knowledge of linguistics, and not a linguist who has set out to describe Quechua.
11

ASPECTS OF PHONOLOGY IN AN 'AXIOMATIC' THEORY

1. Axioms and Definitions.

This chapter is concerned with introducing the theoretical notions used to produce the present description. Before proceeding to explain those notions, I shall give the axioms and definitions. In giving these, I quote Mulder:

**Axiom A**: All elements in semiotic sets are functional.

**Def. 1a.** 'Functional' for 'separately relevant to the purport of the whole of which it is a part'.

**1b.** 'System' for 'set of functional entities'.

**Explanation 1**: Nothing can be functional unless it is — in equivalent contexts — opposed i.e. distinctive in respect to something else, or to the absence of any member of the same class. Non-functional elements are not regarded as part of the system.

**Axiom B**: Semiotic systems may contain elements which can be articulated into elements which have both form and meaning or elements which have only form.

**Def. 2a.** 'Sign' or 'symbol' for 'element in a semiotic system with both form and meaning, simply called grammatical element'.

**2a 1.** 'Sign' for 'grammatical element with wholly conventional meaning'.

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1 See Sets, p10.
2a. 'Symbol' for 'grammatical element to which a temporary meaning can be attached by a definition'.

2b. 'Phonological element' for 'element which has only form'.

Explanation 2: The terms 'grammatical' and 'phonological' have a very special and at the same time wide range of meaning. They merely refer to the two articulations mentioned in Axiom B.¹

Def. 3b. 'Simple semiotic system' for 'semiotic system without combinations of elements'.

3c. 'Complex semiotic system' for 'semiotic system with combinations of elements'.

3c¹. 'Unordered semiotic system' for 'semiotic system without ordering relations between elements'.

3c². 'Ordered semiotic system' for 'complex semiotic system with ordering relations between elements'.

3d. 'Articulated semiotic system' for 'ordered semiotic system'.

3d¹. 'Articulation' for 'set of ordering relations between elements in combinations'.

Explanation 3: Definition 3d. is exclusive, therefore all other semiotic systems (i.e. simple or ordered) are unarticulated. No semiotic system is to be called a language unless it possesses both articulations.

Def. 4a. 'Paradigmatic' for 'the oppositional or distinctive aspect of semiotic elements'.

¹For the complete Explanation, consult Sets, p10.
Explanation 4: By Axiom A, and the definitions connected with that axiom, every element in a semiotic system stands in a paradigmatic relation with at least one other element, or with zero. In ordered semiotic systems, elements may stand in syntagmatic relations with other elements. In the latter, there may be unordered combinations as well. (In grammar, one has to consider fields of relations on different hierarchical levels, the one at the lowest level to be

---

In this work, only the term 'distributional unit' will be used.
called 'distributional unit'. In phonology, only one type - the
distributional unit' - has to be considered.)

Def. 5.
'Element' or 'semiotic element' for 'paradigmeme' or syntagmeme'.

5a. 'Paradigmeme' for 'member of a semiotic set'.
5b. 'Syntagmeme' for 'paradigmeme standing in a position'.

2. 'Positions' and 'Ordering Relations'.

The notion which most characterises Mulder's functionalist
theory in relation to other theories of this kind is the notion
'position'(Def. 4c2). This notion has a bearing on the establishment
of the 'distributional unit'(Def. 4c3, Explanation 4), 'syllables'
(to be defined), and all paradigmatic sets(Defs. 4a., 5a., 5b).
Though the notion 'position' is important in grammar also, here I
shall consider only its place in the theory as far as phonology is
cconcerned.

In phonology, the elements which may occur in 'positions' are
the phonemes. 'Phonemes' are potential 'syntagmemes'(Def. 5b.), in
fact the minimum potential syntagmemes in phonology i.e. minimum
'paradigmemes standing in a position'(Def. 5b.). Between the
distinctive features(to be defined)of phonemes, there are no
ordering(syntagmatic)relations. 'Distinctive features' are para-
digmatic features with no syntagmatic possibilities. They cannot,
Diagram 1

complex semiotic systems

unordered

ordered

one articulation

into phonological elements

into signs

a. traffic signs
b. communication
system/teos

two articulations

(into phonological elements and signs)

into grammatical elements

into symbols

a. Morse code arithmetic
b. digital computer

a. algebra
b. mathematical logic

t

human language

Mulder's Scheme for Semiotic Systems
(From Sets, pl4)
unlike 'phonemes', be regarded as potential 'syntagmemes'.

'Phonemes' can be described, but not yet defined, in the following three equivalent ways:—

1. The minimum phonological elements which may be regarded as having position.

2. The minimum phonological elements between which there may be ordering relations.

3. The minimum potential 'syntagmemes' in phonology.

The notions 'syntagmatic' and 'position' are thus closely related in the theory. As far as description 2 (above) is concerned, it should be noted that there are not always ordering relations between phonemes (see Explanation 4). An example which shows that this is a true statement in terms of the theory is provided by Castilian /bueno/. The combination (of phonemes) /bu/ is unordered (i.e., /b/ and /u/ are in relations of 'simultaneity'). In these positions in the distributional unit in Spanish, the combination /ub/ does not occur. /b/ and /u/, while they are in relations of simultaneity, are nevertheless single and separate phonemes in Castilian. This is because, in Castilian, /bu/ is described as extending over two positions in the chain (see p27. for the complete discussion of the notion 'phoneme'). Not all simultaneous bundles of distinctive features are single phonemes, for two phonemes may be in relations of simultaneity in the chain. An item can only be set up as a single phoneme if it is a simultaneous bundle of distinctive features extending over not more than one
position in the chain. In general, but not as a definite consequence of the theory, in one position we establish one phoneme. In order that the above be completely clear, we must say something about 'ordering relations'.

In San Martin Quechua, the following two phonetic forms occur: [kuZ] and [žuk]. In the phonological description, they will be established as /kuZ/ and /žuk/. The fact that these two forms are opposed to each other in a functional way indicates that in this language there are ordering relations between /k/, /u/ and /ž/. This is equivalent to stating that /k/, /u/ and /ž/ may be regarded as 'syntagmemes' (i.e. as elements standing in a position). The elements /k/, /u/ and /ž/, considered in their capacity as 'syntagmemes', may be represented as (e, k), (n, u) and (i, ž), where 'e', 'n' and 'i' denote the positions in which /k/, /u/ and /ž/ stand. We use 'e' as an abbreviation for 'explosive' (position), 'n' for 'nuclear' (position), and 'i' for 'implosive' (position). For the sytagmeme as an n-tuple of this form, which is relevant for a statement of the distribution of phonemes, see Sets, and the present work, p259.

Diagram 11

```
+-------------------+
| positions         |
| explosive  nuclear | implosive         |
| /k/    /u/        /ž/ |
| /ž/    /u/        /k/ |
```

1See Sets, p200-1.
2The positions are underlined in this case to avoid confusion with the phonemes.
3p117-118.
Later, the bundle of positions (explosive, nuclear, implosive) will be established as the 'distributional unit' and 'syllable' for San Martín Quechua in terms of System A.¹

The notion 'position' enables us to deal in a rigorous fashion with both the syntagmatic and the paradigmatic aspects of phonemes. Mulder defines the 'distributional unit' as a 'self-contained bundle of interdependent (and therefore, in fact, simultaneous) positions' (Def. 4c 3). Within the bundle of positions called the 'distributional unit', the properties of the phonemes can, in almost every case, be described completely and exhaustively.²

In the thesis, I refer to the distributional unit as follows - (e, n, i) represents a unit of three positions, where 'e', 'n' and 'i' denote 'explosive', 'nuclear' and 'implosive' respectively. In System A, (e, n, i) is the distributional unit. For System B³, we require to consider an extra 'explosive' position, in order to handle forms such as /trabaxa/, which has a combination in the explosive position. A unit with two explosive positions takes the form (e₁, e₂, n, i), where 'e₁' denotes 'first implosive' (position) and 'e₂' denotes 'second implosive' (position). The notion 'archiposition', which figures in the cases where there is a neutralisation of positions in the syllable, is explained in the application in 111(p44).

¹ For an explanation of 'System A', see p42.
² In certain cases, notably for some neutralisations, in Quechua, we have to use the 'accent group' as the distributional unit. See p57-9.
³ For an explanation of 'System B', see p42.
3. The Definition of the 'Phoneme'.

Mulder\(^1\) defines the 'phoneme' thus:

"A simultaneous bundle of distinctive features in phonology, which does not extend over more than one position in the chain."

We said before that between the distinctive features of phonemes there are no ordering relations - distinctive features have paradigmatic, but not syntagmatic, possibilities i.e. they may not be syntagmatic elements. Distinctive features are regarded as coming in 'bundles' (N.B. A 'bundle' of one feature is not excluded) - between these 'bundles' (but not between the features which constitute the bundle) there may be ordering relations i.e. bundles of distinctive features may be syntagmatic elements.

The fact that there may be instances where a given phoneme is not in syntagmatic relations with another phoneme in the chain\(^2\) does not mean that it may no longer be regarded as a syntagmatic element. What is important is that there are cases where that phoneme may be regarded as a syntagmatic element. In contradistinction to the distinctive features, the phoneme has the capacity for entering into syntagmatic relations with other elements.

In San Martín Quechua, in 'e' and 'n', the combinations /iu/ and /ui/ are functionally opposed - they are sequences of two

\(^1\)Sets, p26.

\(^2\)For example, Castilian /bueno/, where the phonemes /b/ and /u/ are in relations of simultaneity.
phonemes. The existence in the dialect of syllables such as /uik/ and /iuk/, which are functionally opposed to one another, indicates that between /u/ and /i/ (above) there are ordering relations.

To give a point of reference for the description, I have devised a diagrammatic representation of the description of /u/ and /i/ in such syllables (omitting the element /k/ in 'i'). In the diagrams, $R^0$ denotes 'ordering relations', and $R^{\text{Sim}}$ denotes 'relations of simultaneity'.

Note that, while there are ordering relations between the elements which stand in positions, there are no ordering relations between the positions themselves.

Diagram 111

\[
\begin{align*}
\text{/u/} & \quad R^0 & \quad \text{/i/} \\
\left(\text{\textquoteleft\text{labial} \text{R}^{\text{Sim}} \text{\textquoteleft\text{vocalic}}\right)} & \quad R^0 & \quad \left(\text{\textquoteleft\text{close} \text{R}^{\text{Sim}} \text{\textquoteleft\text{spread}\right)}
\end{align*}
\]

in 'e'

\[
\begin{align*}
\text{/i/} & \quad R^0 & \quad \text{/u/} \\
\left(\text{\textquoteleft\text{palatal} \text{R}^{\text{Sim}} \text{\textquoteleft\text{vocalic}}\right)} & \quad R^0 & \quad \left(\text{\textquoteleft\text{close} \text{R}^{\text{Sim}} \text{\textquoteleft\text{rounded}\right)}
\end{align*}
\]

in 'e'

in 'n'

The reason why the distinctive features of /i/ and /u/ are different in 'e' and 'n' is part of the subject matter of 4 (below).

\[1\] 'Positions' are in relations of simultaneity. See Sets, p28.
As I have said already, 'distinctive features' are features with only paradigmatic aspect i.e. they are in relations of simultaneity. In order to show relations of simultaneity, it is sufficient to show non-ordering relations. By Def. 4b², the notion 'simultaneity' is defined as 'non-ordering relations'.

In San Martín Quechua, /m/ is opposed to /n/ by virtue of the distinctive features 'labial' \( \sim \) 'apical':

\[
\begin{align*}
/m/ & : \text{labial, nasal} \\
/n/ & : \text{apical, nasal}
\end{align*}
\]

This may be expressed for the description (in particular, for cases of neutralisation) in the manner given by the diagram below, which treats /m/ and /n/ as classes of distinctive features. The classes constituted by /m/ and /n/ are:

\[
\begin{align*}
/m/ & : \{\text{labial, nasal}\} \\
/n/ & : \{\text{apical, nasal}\}
\end{align*}
\]

Set-theoretically:

\[
\begin{array}{c}
\sim \\
\text{labial} \\
\text{nasal} \\
\text{apical}
\end{array}
\]

\[
/m/ \quad /n/
\]
The intersection of the two classes may be the feature of an archiphoneme, should it be that in a particular language the opposition between /m/ ∼ /n/ i.e. 'labial' (nasal) ∼ 'apical' (nasal) is neutralised in a certain context. Diagrams of the above form are used only where cases of neutralisation of opposition are concerned. If there is no neutralisation of opposition in a particular language between 'labial' and 'apical' (nasals), we should have no reason for considering an intersection of classes. Intersection of classes of distinctive features is of interest only where there is a tentative neutralisation, for in the absence of such a neutralisation, classes of distinctive features (phonemes) are disjoint.

A typical situation in a language for a classification into distinctive features might be as follows:

<table>
<thead>
<tr>
<th>SERIES</th>
<th>occlusive</th>
<th>nasal</th>
</tr>
</thead>
<tbody>
<tr>
<td>occlusive</td>
<td>p</td>
<td>m</td>
</tr>
<tr>
<td>labial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>n</td>
</tr>
</tbody>
</table>

The use of the notions 'series' and 'order' is a hallmark of 'functionalist' linguistics.¹ Mulder explains the notions 'series' and 'order' in the following way:

¹ The notions are used by Martinet, EGL, 3.15; also, by Mulder, Sets, p115.
"... 'orders' and 'series' are sets of disjoint (non-overlapping) subsets of phonemes having in realisation roughly the same 'place' (orders) and the same 'mode' (series) of articulation."¹

'Series' are subsets such as 'occlusive', 'fricative', 'nasal', 'sibilant', 'vocalic' etc. 'Orders' are subsets such as 'labial', 'apical', 'palatal', 'velar', 'uvular'. Which 'series' and 'orders' we establish, of course, depends on the phonological system and subsystems of a particular language.

By classifying phonemes in series and orders on the basis of distinctive features, we arrive at what is termed the over-all system (based on distinctive features). A good initial hypothesis for the over-all system for mestizo Spanish (Lamas, Sisa) would be the following:

<table>
<thead>
<tr>
<th></th>
<th>voiced occlusive</th>
<th>unvoiced occlusive</th>
<th>fricative</th>
<th>nasal</th>
<th>trill</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>b</td>
<td>p</td>
<td>f</td>
<td>m</td>
<td></td>
<td>u</td>
</tr>
<tr>
<td>simple</td>
<td>d</td>
<td>t</td>
<td>s</td>
<td>'n</td>
<td>r</td>
<td></td>
</tr>
<tr>
<td>complex</td>
<td>ẓ</td>
<td>ǭ</td>
<td>ń</td>
<td>r</td>
<td>i</td>
<td></td>
</tr>
<tr>
<td>dorsal</td>
<td>g</td>
<td>k</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Unclassified: /l/]

It may not always be possible to bring every phoneme under such a classification. In many languages /r/, for example, is not opposed

¹Sets, p115.
to any other 'trill' phoneme. Assuming, for argument, that in mestizo Spanish /r/ is not opposed to the phoneme /r/, we should have to omit /r/ from the over-all system. It is important that we understand exactly why this is the case. It is not permissible to have a subsystem with the following characteristics:

<table>
<thead>
<tr>
<th></th>
<th>nasal</th>
<th>trill</th>
</tr>
</thead>
<tbody>
<tr>
<td>simple</td>
<td>n</td>
<td>r</td>
</tr>
<tr>
<td>complex</td>
<td>ü</td>
<td></td>
</tr>
</tbody>
</table>

This is because there is no way by which 'simple' can be shown to be a feature of /r/. The phoneme /r/ is said to be outside the system. We say that it has only the feature 'r-ness'. A situation very similar to the above holds in San Martín Quechua for the phoneme /r/. It also comes about in San Martín Quechua that /k/ is outside the system, for it cannot be shown to have the feature 'occlusive':

<table>
<thead>
<tr>
<th></th>
<th>occlusive</th>
<th>nasal</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td>m</td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>n</td>
</tr>
<tr>
<td>palatal</td>
<td>ñ</td>
<td>ü</td>
</tr>
<tr>
<td>(dorsal)</td>
<td>k</td>
<td>-</td>
</tr>
</tbody>
</table>

The phoneme /k/ is outside the system, and has only the feature 'k-ness'.

We arrive at subsystems of the type discussed in this section.
on the basis of 'connective opposition classes' (see p118). I will demonstrate how we arrive at connective opposition classes in San Martin Quechua in III.

The notion 'distinctive feature' in the true functionalist sense has little or no relation to the Jakobsonian notion 'distinctive feature'. Given that extensions of Jakobsonian phonology have been taken up recently with specific reference to Quechua, I shall devote some space here to explaining some of the more important differences between Jakobsonian 'distinctive features' and true functionalist 'distinctive features'. In the functionalist scheme, the distinctive features of phonemes in a particular language are always stated as the outcome or product of a network of oppositions between phonemes in that particular language. In this scheme, the phonemes of one particular language have no relation whatever to phonemes in another language (no matter how close the approximation between two sets of distinctive features, or between two phonetic realisations). If /r/ in language A and /r/ in language B both may be described as simultaneous bundles of the features 'simple, trill', they are regarded as different phonemes, for they belong to different systems. In the functionalist scheme, 'distinctive features' (and phonemes) are particular to each language. In Jakobson's scheme, 'distinctive features' are universals. He holds that the

1 Preliminaries to Speech Analysis, p7.

2 See under PARKER, G.J. in BIBLIOGRAPHY AND REFERENCES. The Working Papers in Linguistics bulletin is privately circulated, and the author's permission has not been received for citing specific sections of the article mentioned.
phonemes of all languages may be described in terms of a limited set of binary oppositions between universal features. In such a system, it is possible to have the same phoneme /r/ in two different languages, if in both cases the item in question can be shown to utilise the same features out of the universal set of oppositions. This trend of thought lies at the basis of recent attempts in Quechua linguistics to establish a generative phonology for certain dialects.

5. Distinctive Features in Subsystems.

It will often be the case that the set of distinctive features established for a phoneme in a subsystem may not be established for that same phoneme in the over-all system (either for consonants or for vowels), or in the over-all inventory (of consonants and vowels).

A good example is provided by the phoneme /u/ in San Martín Quechua. As will be shown later, /u/ operates in all three positions in the syllable in System A - i.e. in 'e', 'n' and 'i'. In the peripheral positions ('e' and 'i'), /u/ commutes with /p t k m n ñ ñ ñ ñ r s s s o/. In the consonantal system, /u/ has the features 'labial, vocalic':

---

1 Preliminaries to Speech Analysis, pl8 et seq.
2 See Footnote 2, p33.
3 We term 'consonantal' those items which may only come in peripheral positions. We term 'vocalic' those items which may only come in nuclear position. See IV.
In the nuclear position in System A, /u/ commutes with /a i/. A tentative classification which suggests itself is the following:

<table>
<thead>
<tr>
<th></th>
<th>open</th>
<th>close</th>
</tr>
</thead>
<tbody>
<tr>
<td>rounded</td>
<td>a</td>
<td>u</td>
</tr>
<tr>
<td>spread</td>
<td></td>
<td>i</td>
</tr>
</tbody>
</table>

Such tentative systems were ruled out on p32. The phoneme /a/ can not be shown to have the feature 'rounded' in the absence of an 'open' phoneme which is not 'rounded'. The phoneme /a/ lies outside the system - it has the feature 'a-ness'. Given this, it follows that /i/ and /u/ are outside the system also - they have the features 'i-ness' and 'u-ness' respectively. In the vocalic system, and overall inventory, /u/ has the feature 'u-ness'.

6. 'Syntagmatic', 'Paradigmatic' and 'Position'.

Diagram IV on p36 illustrates the relations which hold between a paradigmatic class with the members \{p, t, k, m, n, ŋ, ŋ, ŋ, i, u\} which occurs in 'e'. This is an imaginary paradigmatic class. In a hypothetical language, this class could constitute a 'position class' in 'e', or a 'commutation class', but the class does not correspond

\(^1\) See Sets, p115.
to any class in the description of San Martín Quechua. It is used here merely as an illustration.

In the diagram, 'syntagmatic' relations hold between

a. Any member of the class in 'e'

and   b (a, Ø)
'Paradigmatic' relations hold between any member of the class in 'e' and any other member of that class. This is equivalent to stating that the members of the class in 'e' may be regarded as 'paradigmemes' i.e. as /p/, /t/, /k/ etc., or as 'paradigmemes standing in a position'('syntagmemes'), which we may represent as (e, p), (e, t), (e, k) and so on, in which case we take the element in question along with the position in which it occurs.

7. Some Definitions.

At this point, I would like to give a set of definitions which are relevant for the phonological description which follows. Some of these definitions have been given already, but they should be viewed now along with the definitions of other models given below, therefore I have drawn together several definitions here.

Def. 1
'phoneme': 'simultaneous bundle of distinctive features in phonology, which does not extend over more than one position in the chain'

Def. 2.
'distinctive feature': 'paradigmatic feature in phonology'(Def. 4a., Explanation 1), OR 'feature which distinguishes (or sets up a relation of opposition) between a phoneme and any other member of the same set'

Def. 3.
'commutation': 'substitution of one member of a set occurring in a position by another member of the same set (which member must be capable of occurring in
38.

Def. 4. 'distributional unit'

'self-contained bundle of interdependent positions, within which the properties of the phonemes can be described exhaustively'.

Def. 5. 'syllable'

'a simultaneous bundle of positions which is a subset of a simultaneous bundle of positions called a distributional unit, which subset contains an explosive, a nuclear and an implosive position or position-group'.

Def. 6. 'distinctive function'

'the relation of a form with regard to all forms to which it is opposed by commutation'.

Def. 7. 'neutralisation'

'suspension of distinctive function'.

Def. 8. 'archiphoneme'

'the product of a neutralisation' OR 'a phoneme in a subsystem which, when projected into the over-all system, is represented there by two or more phonemes'.

The explanation of Def. 5., 'syllable', which is conceived as a subset of the 'distributional unit', will be given in III.

Those operations demonstrated by Mulder in "Classificatory Calculus and Ordering Relations", are applied in VIII. These

1 For the source of this definition, see Sets, p24.
2 See Sets, p114.
3 Sets, III, p115.
operations are important for the establishment of the distinctive features of phonemes, but also have an important bearing on the problem of the 'bilingual system'\(^1\) as approached in this thesis. These operations enable us to perform as penetrating an analysis as has been possible to date in establishing such systems. To explain the procedures involved in the 'classificatory calculus' at this stage would be to repeat what Mulder has already explained very clearly in *Sets*(III), with reference to Pekingese. In *VIII* of the present work, however, the definitions of the relevant classes and the procedures by which those classes are established will be given in the course of the description.

8. Explanation and Testability.

This brief explanation of the models used to produce the present description will, I believe, serve as a useful preliminary to the application of the theory. Throughout the application, however, the description and how it is arrived at under the theory is explained and references are made in the Footnotes to the "Axioms and Definitions" given in 1. of this chapter, and to relevant sections of *Sets*. Needless to say, consultation of Mulder's book, particularly of Chapter III, will bring the reader many advantages when he comes to read the present work, for clearly I cannot hope to achieve the completeness of explication attained in *Sets*.

\(^1\) See p42.
This is not to say that the explanation given here, along with that to be given in the course of the description, will not be sufficient to enable the reader

a. To understand this description in terms of the 'axiomatic' theory used

and b. To test the description for consistency and adequacy.

If the explanation given does not enable the reader to carry out a and b (above), there are grounds for criticism of the work.


In order that the present description be understood clearly, the limits of a strictly synchronic approach must be realised. By 'synchronic', I mean 'performed with reference to one system at one point of time'. It is particularly important to realise the limits of synchronic description when we attempt to describe those elements which we recognise by diachronic criteria to be 'Spanish'. By 'diachronic criteria', I mean 'criteria which involve reference to either more than one system or to more than one point of time (in the history of a language)'.

By diachronic criteria, we can state that the elements /b d g f x e o/ occur mainly, but not exclusively, in 'extraneous' forms, 'foreignisms', 'Spanish loans' or 'Spanish' forms, depending on our choice of terminology. I use the term 'Spanish form' in the thesis. When we describe an element in this way, what we are stating

\footnote{There is an element of re-definition which may be signalled here. Traditionally, the terms 'synchronic' and 'diachronic' have been regarded as having only temporal reference.}
is that, on the whole, it occurs in forms which are formally
similar to mestizo Spanish. This is a diachronic statement, in
that it does not confine itself to the description of one set of
data at one point of time, but makes a cross-reference to another
system.

It would be very convenient if there existed a criterion by
which an element such as /f/ in San Martín Quechua could be
demonstrated to be 'extraneous' without such a cross-reference to
mestizo Spanish i.e. if there were a purely synchronic procedure
for establishing marginality or extraneity. There does not, however,
appear to be any means by which such a conclusion might be reached
within the bounds of one synchronic description. This conclusion
can only be reached in an intuitive way by a (diachronic) comparison
of two (or more) synchronic descriptions.

In the description, I isolate a set of forms in which /b d g
f x e o/ occur on the basis of their formal similarity to Spanish.
This decision is perforce diachronic and arbitrary. In fact, some
items resist even this intuitive description. The phoneme /l/, for
example, occurs in a set of (diachronically) 'Quechua' forms, and
in a set of (diachronically) 'Spanish' forms. In the former, it occurs
in 'e'; in the latter, it occurs in 'i'. This suggests that, when /l/
comes in 'e', it is 'Quechua', but, when /l/ comes in 'i', it is
'Spanish'. In fact, such a decision is very difficult to maintain

1Nowhere in the thesis is any reference made to Castilian in this
connection.
in the description. The element /l/ is best regarded as neither 'Spanish' nor 'Quechua' (in the sense referred to here); it will be included in both systems which we establish to account for the data – the phoneme /l/ figures in both my System A and my System B.\(^1\) In spite of this kind of difficulty, most diachronic 'loans' can be isolated. In the thesis, I describe the data 1. without the diachronic 'loans', and 2. with the diachronic 'loans'. The two systems arrived at are called System A(1) and System B(2). It must be stressed that there is no way of stating that /b d g f x e o/ are 'extraneous', except by a diachronic argument. The synchronic procedures which I outline in the course of the description can bring no more than a measure of reinforcement to the diachronic argument.

The following definitions must be noted in connection with this problem:

'bilingual data': 'data with intuitively observable foreign (in this case, Spanish) elements in it'.

'bilingual system': 'system in which a set of forms has been specified as foreign (in this case, Spanish)'.

'Spanish form' or 'extraneous form' or 'foreign form': 'element which is formally similar to a member of another system (in this case, Spanish)'.

\(^1\) See p126-33 passim.
In spite of the fact that we cannot, solely by reference to one system, or within the bounds of one description, demonstrate that an element such as /f/ is extraneous, I do not reject as useless the exploration of the implications of such elements in the system. On the contrary, several interesting issues emerge which lead us to a greater understanding of the system.

Much space is devoted to these matters in the thesis, where the procedures are made quite clear, and the permissible synchronic arguments are set down. The purpose of this short note is to emphasise the fact that the above-mentioned set of forms cannot be isolated by synchronic criteria. The notion of a 'loan' does not figure in this (nor, perhaps, in any) synchronic theory.

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1 In order that such a conclusion (or any conclusion, for that matter) be demonstrated, it would have to be shown to be a logical follow-on from certain initial conditions either in the theory or in the description. I doubt very much if such a demonstration can be found.
'DISTRIBUTIONAL UNIT' AND 'SYLLABLE'

1. Preliminary Tests.

For 'distributional unit', see Def.4c(l1), and Sets, p25-26.

A unit of three positions enables us to give a straightforward and exhaustive description of a very large set of forms in the data (at a rough estimate, 90 percent). In this model, the three positions are called 'explosive', 'nuclear' and 'implosive' - I abbreviate these terms to 'e', 'n' and 'i' respectively. I refer to the unit as a whole as (e, n, i). The model applies to the data in the following way (noting that I anticipate a later description which establishes the items in the positions as phonemes): -

Fig.1

<table>
<thead>
<tr>
<th></th>
<th>e</th>
<th>i</th>
<th>a</th>
</tr>
</thead>
</table>
| /uik/ | u | i | k  
  |   |   | [wiksa] "belly"
| /šik/ | ̣š | i | k  
  |   |   | [čūšik] "owl"
| /ua0/ | u | a | φ  
  |   |   | [wāta] "year"
| /ta0/ | t | a | φ  
  |   |   | [tāta] "father"
| /kaš/ | k | a | ź  
  |   |   | [kāšna] "this way"
| /uau/ | u | a | u  
  |   |   | [wauki] "brother"
| /čuk/ | č | u | k  
  |   |   | [čukča] "hair"
This set corresponds formally in most, but not all, cases to the set which, by diachronic criteria, we call 'Quechua'.

There is a small set of forms which cannot be handled with a three-position-unit, unless we allow complex items to figure in 'e'. These are forms such as [bwénu] and [fjésta]. Unless we allow complex items in 'e', these require a unit of four positions. This unit differs from (e, n, i) in that it has two 'explosive' positions, 'el' and 'e2'. This unit applies to the data in the following way:

Once we have reached this point, we have made a reasonable start to describing the system. The above preliminary test for the distributional unit suggests that, broadly speaking, there are two sets of forms in the data. The set which can be described by

---

1 Non-complex items are items such as /p/, /t/, /k/ etc. Complex items are items such as /ti/, /pl/ etc., which may be described as one or two phonemes depending on the distributional unit chosen.

2 For a more complete account, see p46 et seq, p214 et seq.
a unit of four positions corresponds formally in most, but not all, cases to the set which, by diachronic criteria, we call 'Spanish'.

The choice of the distributional unit is not an easy one. There are several alternative descriptions which can be made (not all equally satisfactory, however), of which I shall discuss four here. To discuss more than four would complicate the description without giving additional information. The four alternatives which I shall discuss here are:

1. We can describe all the data with a unit of four positions.
   This is the unit \((e_1, e_2, n, i)\).

2. We can describe one set of forms with the three-position unit \((e, n, i)\), and the rest with the four-position unit \((e_1, e_2, n, i)\). This way, we establish two unrelated systems at the first level.

3. We can describe all the data with a three-position unit \((e, n, i)\), and allow a complex item in 'e'.

4. We can arbitrarily exclude the diachronically 'Spanish' forms, thereby rendering the data describable, without complexes in 'e', by the three-position unit \((e, n, i)\).

Alternative 1: this description uses a unit \((e_1, e_2, n, i)\). If we apply this unit, it is found that the contrast between 'el'
and 'e₂' is neutralised when we describe certain forms, and a subset 'E' is the product of the neutralisation. The product of a neutralisation of positions is called an archiposition¹, and can be shown diagrammatically to be conceived as the intersection of two classes (in this case, 'e₁' and 'e₂'):

Fig. 111.

The Archiposition 'E'

From the distributional unit (e₁, e₂, n, i), two subsets can be established. These are (e₁, e₂, n, i) and (E, n, i). These subsets are termed 'syllables'. The definition of the 'syllable' is:

'a simultaneous bundle of positions which is a subset of a simultaneous bundle of positions called a

¹Sets, p105.
distributional unit, which subset contains an explosive, a nuclear and an implosive position or position-group' (See Def. 5., p38).

The reason for establishing the archiposition 'E' (and hence a subset '(E, n, i)') can be shown by the example of the potential syllable /kuk/: -

**Fig. IV.**

<table>
<thead>
<tr>
<th></th>
<th>e1</th>
<th>e2</th>
<th>n</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>k</td>
<td>∅</td>
<td>u</td>
<td>k</td>
</tr>
<tr>
<td>b</td>
<td>∅</td>
<td>k</td>
<td>u</td>
<td>k</td>
</tr>
</tbody>
</table>

No decision is possible as to which position the first /k/ belongs. In fact, both the above interpretations are untenable in terms of the theory, because '∅' (zero) in both a. and b. is meaningless. ¹

There is no phoneme which can come in 'e2' in a., nor in 'el' in b. The item /k/ must be given as standing in an archiposition 'E', which position stands for both 'el' and 'e2'. The correct description of /kuk/ in terms of the theory is:-

**Fig. V.**

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>k</td>
<td>u</td>
</tr>
</tbody>
</table>

There is no doubt that one can arrive at a consistent and adequate description of the data with this model. A random set of forms

¹'Zero' is used to indicate a position which can be filled. Unless we maintain this, any number of 'zeros' may be given in a form.
from the data would be described as follows:

<table>
<thead>
<tr>
<th>el</th>
<th>e2</th>
<th>n</th>
<th>i</th>
<th></th>
</tr>
</thead>
</table>
| /plaN/ | p  | l   | a   | N    | [plantánu] "banana"
| /kuk/   | k  | u   | k   |      | [rimákuk] "one who speaks"
| /rar/   | r  | a   | r   |      | [rárka] "barranco"
| /briN/  | b  | r   | i   | N    | [bríntka] "leap"
| /kaž/   | k  | a   | ŋ   |      | [kásna] "this way"
| /Caž/   | ŋ  | a   | ų   |      | [ážpa] "earth"
| /čuk/   | č  | u   | k   |      | [čúcča] "hair"
| /tícN/  | t  | i   | e   | N    | [tjémput] "time"

There is one drawback in this description. It involves assigning most of the forms which are a majority and, in most cases, diachronically 'Quechua', to a subset which is included in (el, e2, n, i), which unit of four positions is only necessary because of the minority set of forms which, in most cases, is diachronically 'Spanish'. For the sake of a small number of forms in the data, we use the unit (el, e2, n, i). In this description, the majority set of forms is allocated to the subset (E, n, i). Theoretically, there can be no objection to this, for it is a matter of pure coincidence that the majority set of forms may be handled in a satisfactory way only by a 'syllable' which has a greater extension than that required
for the majority set of forms. The archiposition 'E' is a product of 'el' and 'e2'. Without 'el' and 'e2', there would be no 'E'. In the description, this means that there would be no syllable /tOaO/ without a form /tra/ (and the diachronically 'Quechua' /ta/ has to be described as /tOaO/). This suggests that without the 'Spanish' forms, there would be no 'Quechua' forms. This description is pragmatically difficult to accept, given our strong intuitions that a minority set of forms is being allowed to dictate the description.

Alternative 2: we could recognise that one set of forms can be described by (el, e2, n, i), and another by (e, n, i), and describe the two sets accordingly. This would mean setting up two separate systems right away, because (el, e2, n, i) and (e, n, i) are unrelated units. They are not related in the way that (el, e2, n, i) and (E, n, i) are related, with 'E' ≤ 'el' X 'e2'. This method has the apparent advantage of being more straightforward than Alternative 1 (it involves no archiposition), but involves apriorism which will become clear if we consider the following theoretical problem, which, of course, has implications in the description. Consider the form /tra/ - in (el, e2, n, i), this would be described as /traO/. Now consider the form /ta/. This form would have to be described in (el, e2, n, i), given the occurrence of /tra/ - it would be given as /tOaO/. But now consider /sXa/ - there is no form /sXa/ (where 'X' denotes any phoneme or archiphoneme) which would allow us to give
/a/ as /a0a/; therefore /a/ would be described in (e, n, i) as /a/. It results from this that /ta/ and /a/ would have to be given as members of different systems, and the diachronically 'Quechua' system loses, in /ta/, one of its syllables par excellence. By giving /t0a0/, in this description, and /a0a/, we assign /ta/ and /a/ to different systems, because (el, e2, n, i) and (e, n, i) are unrelated models. This is quite different from (el, e2, n, i) and (E, n, i), which are subsets of one distributional unit leading to two subsystems of one and the same system. If we set up two unrelated systems, we are faced, in several cases, as well, with the dilemma of knowing in which system to place a given sequence of phonemes. These are sufficient reasons for ruling out Alternative 2.

In this description, the final result is that no system can be set up for (el, e2, n, i) - the forms which require this unit are too few in number to be established in a system on their own.

There is the added difficulty that the establishment of two unrelated systems 'cuts across' the set of diachronic 'Spanish forms' - elements such as /sol/ (a diachronic 'Spanish form') may be described in (e, n, i).

Alternative 3: this alternative is simpler than Alternative 1, because, by using a unit (e, n, i) to describe all forms in the data, we do not have to consider the archiposition, and the two subsystems which are a consequence of establishing two syllables.
Also, this description does not bring the pragmatically undesirable consequence that the majority set of forms is, as it were, on a lower level than the minority set.

However, one very serious (and, I believe, insurmountable) problem comes with this description. The form /tra/ is described in the following way:

Fig. VII.

\[
\begin{array}{ccc}
  & e & n \\
tr & a & \emptyset \\
\end{array}
\]

That is, we have to include a complex in 'e'. If we use (e, n, i), we cannot establish /t/ and /r/ as separate phonemes - if we are to establish /tr/ as a phonological element, it is a single phoneme. In describing two syllables such as /taN/ and /traN/, /t/ would be opposed to /tr/ in 'e':

Fig. VIII.

\[
\begin{array}{ccc}
  & e & n \\
  & t & a \\
  & tr & a \\
\end{array}
\]

Given that /tr/ occurs in one position, it has to be treated as a single phoneme. The element /tr/ is a simultaneous bundle ([rt] does not figure in this position) extending over only one position in the chain - i.e. one phoneme.

It is totally impractical to establish a system for San Martín
Quechua phonology which includes complexes such as /pl/ in the inventory and over-all system as single phonemes. The distinctive features of these phonemes cannot be established without yielding absurdities in the system. For instance, /p/ is opposed to /pl/, let us say, by the feature 'lateral' or 'liquid', but to /pu/ by the feature 'vocalic', and to /pr/ by the feature 'trill' and so on. This particular problem has no ready solution. Even if we were able to overcome this problem of distinctive features, we should have an inventory of some forty-two phonemes.

In the face of these problems, we could decide to omit the elements such as /pl/, /fr/, /tr/ etc., but this 'cuts across' the diachronically 'Spanish' set for the same reason as Alternative 2 i.e. some diachronically 'Spanish' elements(e.g. /sol/)may be described without too much difficulty in (e, n, i).

Before discussing Alternative 4, I shall review the general situation. We have a diachronically 'Quechua' set of forms which can be described with a three-position unit, and a diachronically 'Spanish' set of forms which require a four-position unit. A small set of diachronically 'Spanish' elements may be described by a three-position unit, but, as far as I know, only two diachronically 'Quechua' forms could conceivably require a four-position unit.1

If we use two distributional units (el, e2, n, i) and (e, n, i), as well as encountering the difficulties described on p50-l, we have the undesirable consequence that some of the 'Spanish' forms could be described without too much difficulty in (e, n, i).

---

1 I refer to [wámbrə](baby), [Zángwa](leaf).
are described in (e, n, i), while others are not (those which require a four-position unit). The set which require a four-position unit are simply too few in number to constitute a system.

A similar thing happens when we attempt to describe all the data with the three-position unit - the elements which require a four-position unit prove unworkable, but other 'Spanish' forms are described. We describe /sol/, but not /briNka/.

I believe that we must either describe all the 'Spanish' forms or none at all. I can see no significant increase in our knowledge coming about by our describing roughly half of the 'Spanish' forms together with the 'Quechua' forms, and leaving the other half out of the description completely. If we agree that to do this would be unsatisfactory, we can narrow our range of alternatives to 1 and 4.

1. We include extraneous, 'Spanish' forms, and proceed to use a unit of four-positions throughout - (el, e2, n, i).

4. We omit the extraneous, 'Spanish' forms altogether on diachronic grounds, and proceed to describe the remaining ('Quechua') forms with a three-position unit - (e, n, i).

If we opt for 1, we have to accept the counter-intuitive result that the 'Spanish' set of forms 'dictates' the whole description, including that of the 'Quechua' forms. In fact, if we include the diachronically 'Spanish' forms, there are grounds for the argument that the system at which one arrives is no longer an autonomous 'Quechua' system. I can assure the reader that bona fide Quechua
(diachronically speaking) can be described by a unit of three positions.

My description of Quechua is quite different from Bloomfieldian ones - in the latter descriptions, 'Spanish' forms are included apparently ad hoc in the system for Quechua, without any hint of descriptive consequences. It is usually the case that, in a Bloomfieldian scheme, there are no consequences.

Under a functionalist view, there are descriptive consequences involved in Alternative 1. These can be avoided by opting for Alternative 4, but only at the expense of leaving a set of forms in the data undescribed.

Firstly, I shall formulate a system according to Alternative 4 - this system corresponds to the diachronically Quechua system. I shall then formulate a system according to Alternative 1 - this system corresponds to the diachronically 'mixed' Quechua-Spanish system. The former I call System A; the latter I call System B.

One of the notable conclusions to arise out of this dual description is that the data which we call (intuitively) 'Quechua' is not described in the same way in Systems A and B. The inclusion of 'Spanish' forms in the description does not merely entail describing the Quechua forms, then 'tagging on' to them the Spanish forms.

This point may be schematized in the following way:

---

1 In the absence of explanation, this is exactly the appearance of these descriptions.
Data | Description
---|---
'Quechua forms' Q | System A ('Quechua' system)
'Quechua forms' Q + 'Spanish forms' S | System B ('mixed' system)

System B does not include System A, although, diachronically, the data has the same intuitively observable set Q of 'Quechua forms' throughout. To give one example:

Data | Description
---|---
[ríptin](Q) | /rìptin/ ('Quechua' system)
[ríptin](Q) + [páka] (S) | /rìBtin/ ('mixed' system)

The inclusion of /b/ entails a neutralisation in System B, and an archiphoneme /B/ in System B. The form [ríptin] is diachronically 'Quechua', but is described as /rìptin/ in the Quechua System A and as /rìBtin/ in the mixed System B.

In this description, the 'Quechua' system secures autonomy only via a diachronic decision to limit the data. Synchronically, we cannot arrive at other than a 'mixed' system.

Contrary to a Bloomfieldian description (which betrays 'Spanish' elements, but is not 'mixed'), where 'Spanish' forms are apparently included ad hoc into the system and without consequence, in a functionalist system the 'Spanish' elements have implications throughout the system. In the course of the description, one of the points

---

Bloomfieldians do not specify diachronic loans from Spanish in their systems.
to emerge will be the great difference between the application of a 'European' theory to this kind of data as compared with that of a Bloomfieldian one. I have chosen Mulder's theory for this description for reasons already stated, but we may note that with Martinet's phoneme theory more than one of the conclusions reached in this thesis can be stated, albeit in a rather more intuitive and less rigorous fashion.

2. The Distributional Unit and Neutralisation.

In San Martín Quechua, there is a form [bampא], which poses a problem when we come to apply the distributional unit of three positions (System A), and of four positions (System B). There are good grounds for stating that [m] in this form is not the realisation of the phoneme /m/, but of an archiphoneme /N/. If we exclude the contexts /-u/, /-i/, /-s/, /-r/, no oppositions between nasals are possible before any phoneme.¹

Applying the three-position distributional unit of System A to [bampא], we come to the syllables /kaN/ and /paO/(assuming further phonological operations which establish the phonemes and the archiphoneme). It is laid down by the theory that no phoneme outside a distributional unit (in this description the 'distributional unit' is the 'syllable') may act as a context for any phoneme inside that unit. Now, it is very likely in this case that the context for the

¹See V, of the present work for a complete discussion of this neutralisation.
neutralisation is the phoneme /p/. This phoneme lies outside the distributional unit in which the proposed neutralisation is held to occur.

In this case, we must consider a distributional unit of greater extension than the 'syllable' (of three positions), if we wish to regard the phoneme /p/ as a context for this neutralisation. The required unit coincides with the accent group of the form in question, which accent group has greater extension than the phonetic syllable in question (the phonetic syllable in which the conditions for neutralisation come about). The accent group for [kámpa] is provided by [kámp]. This enables us to regard /p/ as one of the generating contexts for this neutralisation (there are other such contexts - /t/, /k/, /č/ etc.).

Although undoubtedly a difficult case for the description, the instances of the 'failure' of the distributional unit of positions are not sufficiently numerous to justify a complete rejection of the distributional unit (syllable) of three positions (System A) or four positions (System B). The great majority of forms can be handled with that unit of three positions without difficulty, therefore it would run counter to functionalist policy to dispense with the three position unit for the sake of a limited set of forms in San Martín Quechua. In addition, no alternative presents itself which is more consistent, adequate and simple than that of using the accent group as the distributional unit within which this neutralisation occurs.
The neutralisation can be conceived of as occurring before a phoneme in the same accent group.

Such combinations of phonemes at the end of accent distributional units also have a bearing on certain aspects of variance. In particular, they enable us to get over the problem of the form [kānga], where I establish [g] in System A as a combinatory variant of /k/. If we did not have this kind of distributional unit, we should be faced with a problem in stating in which context /k/ has a combinatory variant realisation [g]. By using the 'accent group' criterion, we avoid the difficult problem of having the nasal (the context for [g]) as the realisation of a phoneme outside the distributional unit in which [g] is held to occur as a variant of /k/. If we use the 'accent group' criterion, we may state that [g] after nasal at the end of an accent group is a combinatory variant of /k/, provided that we have demonstrated that the other requirements for combinatory variance are fulfilled.
The model for the 'syllable' advocated in III gives rise to phonological statements which are radically different from and, in large part, opposed to the Bloomfieldian statements which have been put forward by Quechua scholars. In view of this, I have devoted a short chapter to the application of Mulder's 'syllable'. In this chapter, statements produced by the syllable (e, n, i) applied to the data are compared with Bloomfieldian syllabic statements which, in turn, derive from the Bloomfieldian notion of 'syllable', which is quite different from that used here.

Most descriptions of ÿyllables in Quechua have assumed a priori an absolute dichotomy between consonants and vowels. These are not my notions - they have been defined in several different ways, but in the majority of cases they have been assumed be primitive terms. In my opinion, this assumption is questionable but, for the sake of this chapter, I also assume that they are primitive terms. My own definitions of 'consonant' and 'vowel', which are derived from the notion of 'syllable' used here, are given later in the present chapter.¹

Syllabic structures are characterised in Bloomfieldian statements by way of a series of hypotheses of the form 'CV', 'CVC' and so on, where 'C' = 'consonant' and 'V' = 'vowel'. To cite an example:

¹See Sets, p25-6, for discussion of 'syllable'.

IV

THE BLOOMFIELDIAN 'SYLLABLE'
This is reasonably satisfactory if we work in an inductive way, because a form such as [wáwa] appears to present patterning CV-CV. In fact, we are so used to finding a form such as this described as CV-CV that we might be forgiven for thinking that this is the only way to describe it. This description stands or falls with the assumption that Quechua (or any language, for that matter) has only 'C' and 'V'. A simple set-theoretical representation will show that logically the assumption is untenable. It does not rule out in an acceptable way (e.g. by a theory) two further classes which are logically possible. Logically, we have the following:

Fig. 1.

In Bloomfieldian descriptions, the classes 'CV' and '-C -V' are not ruled out by a theory. As it stands, the Bloomfieldian scheme does not permit elements which are neither 'C' nor 'V', nor does
it permit elements which are both 'C' and 'V'. Therefore, we must take it that, for the Bloomfieldians, the following scheme is axiomatic:

![Diagram](image)

If we do not have 'C' and 'V' as disjoint classes, and give this as an axiom, which Bloomfieldian scholars have not done, we can only conclude that they have failed to take account of the classes 'CV' and '-C-V'. No matter how we view it, the Bloomfieldian 'syllable' is imprecise and ad hoc (it is not the product of a well-formulated theory). The terms 'C' and 'V' are not primitive. It is equally untenable to maintain that 'C' and 'V' are disjoint classes - Jakobson, for example, establishes phonemes which have both consonantal and vocalic features.  

It is purely arbitrary to say that \[wa_{\Lambda} = 'CVC'\]. In an equally arbitrary way, I may argue that \[wa_{\Lambda} = 'CVV'\], with \[\Lambda \neq 'C'\], but

1 See Preliminaries to Speech Analysis, p19.
= 'V'. It is easily seen why Bloomfieldians who use this quasi-
model(it is not a 'model' in the sense used here, for it is not
established as a component in a theory)have insisted on giving
forms such as [\(\text{\xi}\)] in [\(\text{\w}^\text{\xi}\)] as instances of 'C'. If [\(\text{\xi}\)] were given
as 'V', we should have a syllable 'CVV'. There is no reason why
we should not now establish [\(\text{\w}\)] as 'V' also. This would result in
a syllable 'VVV'. Bloomfieldians have not faced this possibility,
but have arbitrarily given all the items on either side of the
syllabic nucleus as instances of 'C'. If we do not impose such an
arbitrary limitation, the number of possible models increases. I
have not taken this method to its ultimate logical conclusion, but
it would seem that there is no limit to the number of models of the
form 'CV', which could be established to account for the data.

Bloomfieldian scholars give [\(\text{\w}\)], [\(\text{\j}\)], [\(\text{\y}\)] and [\(\text{\xi}\)] which, roughly
speaking, occur on either side of the syllabic nucleus\(^1\), as instances
of 'C'. Here are some examples from San Martín Quechua, which I have
described in the Bloomfieldian manner:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| [\(\text{\w}\)] | [\(\text{\w}^\text{\a}^\text{\s}\)] | CV-CV | "house"
| [\(\text{\w}^\text{\a}^\text{\k}\)] | CV-CV | "brother"
| [\(\text{\w}^\text{\a}^\text{\z}\)] | CV-CV | "fish"
| [\(\text{\w}^\text{\a}^\text{\t}\)] | CV-CV | "year"

\(^1\) This is stated rigorously in the present theory by reference to the
positions 'e' and 'i' of the distributional unit/syllable (e, n, i),
which may be termed the peripheral positions.
In my description, the above set of forms are described by the 'syllable' (e, n, i). The items [w] and [u] are treated as combinatorial variants of /u/, which occur in 'e' and 'i' respectively. The items [j] and [i] are treated as combinatorial variants of /i/, which occur in 'e' and 'i' respectively. This is because the following oppositions cannot obtain in San Martin Quechua if we use a model of the type (e, n, i):

\[
\begin{align*}
[w] & \sim [u] \sim [\hat{u}] \\
[j] & \sim [i] \sim [\hat{i}]
\end{align*}
\]

We thus arrive at the following statement in System A:

\[/u/ \text{ is realised } [w].\ldots \text{ in 'e'}\]

\footnote{"It should be noted that by admitting the 'position' criterion, the argument for establishing /w, j/ as distinct from /u, i/ in most languages does not obtain any more. They are merely explosive or implosive variants of /u, i/"(Sets, p27)}
(/u/) is realised [u]................. in 'n'
" is realised [ʌ]................. in 'i'
/i/ is realised [j]................. in 'e'
" is realised [ɪ]................. in 'n'
" is realised [i]................. in 'i'

It is interesting to compare this statement with the Bloomfieldian one, in which [w] and [u], given here as combinatory variants of the phoneme /u/, are treated as the single phoneme /w/, while the nuclear element [u] is described in a way analogous to our own phoneme /u/. The items [j] and [i], given here as combinatory variants of the phoneme /i/, are treated as the phoneme /y/, while the nuclear element [i] is described in a way analogous to our own phoneme /i/. The items /w/ and /y/ are given as instances of 'C', and occur on the right and/or left-hand side of 'V', if they occur at all. Only 'C' can occur in those peripheral positions. In consequence, phonological form is given a different shape in a Bloomfieldian description - I have devised some examples to illustrate the difference:

1
[ˈwɔuki] /ˈuau-ki0/ /ˈuauki/ /ˈwawki/
[ˈjaku] /ˈiag-ku0/ /ˈiaku/ /ˈyaku/
[ˈkəusai] /ˈkau-sai/ /ˈkausai/ /ˈkawsai/
[ˈkuiki] /ˈkui-ki0/ /ˈkuiki/ /ˈkuyki/

1Note carefully that I say 'analogous' and not 'identical'.
1. 'Phonological form' in terms of (e, n, i).

2. 'Phonological form' as a sequence of phonemes without overt reference to (e, n, i).

3. The Bloomfieldian scheme, which does not use a rigorous model for the 'syllable', and which treats /w/ and /y/ as phonemes separate from /u/ and /i/ respectively.

The advantage of using the 'position' criterion is that it enables us to treat phonemes as occurring in a context, which is an indispensable requirement if paradigmatic operations are to be carried out consistently.

Here are some further examples of the syllable (e, n, i), this time applied to 'diphthongs' in San Martín Quechua:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>Mulderian</th>
<th>Bloomfieldian</th>
</tr>
</thead>
<tbody>
<tr>
<td>[wi]</td>
<td>u</td>
<td>i</td>
<td>ø</td>
<td>/ui0/</td>
</tr>
<tr>
<td>[fi]</td>
<td>ø</td>
<td>i</td>
<td>i</td>
<td>/oi1/</td>
</tr>
<tr>
<td>[wi]</td>
<td>u</td>
<td>i</td>
<td>i</td>
<td>/ui1/</td>
</tr>
<tr>
<td>[ja]</td>
<td>i</td>
<td>a</td>
<td>ø</td>
<td>/ia0/</td>
</tr>
</tbody>
</table>

1 The symbol ' merely marks the syllabic boundary, for clarity.
<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>i</th>
<th>Mulderian</th>
<th>Bloomfieldian</th>
</tr>
</thead>
<tbody>
<tr>
<td>wâ</td>
<td>u</td>
<td>a</td>
<td>/uaO/</td>
<td>/wa/</td>
</tr>
<tr>
<td>ái</td>
<td></td>
<td>i</td>
<td>/Oai/</td>
<td>/ay/</td>
</tr>
<tr>
<td>wâi</td>
<td>u</td>
<td>a</td>
<td>/uai/</td>
<td>/way/</td>
</tr>
<tr>
<td>wâu</td>
<td>u</td>
<td>a</td>
<td>/uau/</td>
<td>/waw/</td>
</tr>
<tr>
<td>jâi</td>
<td>i</td>
<td>a</td>
<td>/iai/</td>
<td>/yay/</td>
</tr>
<tr>
<td>áu</td>
<td></td>
<td>u</td>
<td>/Oau/</td>
<td>/aw/</td>
</tr>
<tr>
<td>jû</td>
<td>i</td>
<td></td>
<td>/iuO/</td>
<td>/yu/</td>
</tr>
<tr>
<td>ûi</td>
<td></td>
<td>i</td>
<td>/Oui/</td>
<td>/uy/</td>
</tr>
<tr>
<td>jûi</td>
<td>i</td>
<td>u</td>
<td>/lui/</td>
<td>/yuy/</td>
</tr>
</tbody>
</table>

When we state a syllable-instance as a sequence of phonemes in terms of (e, n, i), either 'e' or 'i', or both positions at once, may be filled by 'zero', which I represent as either '0' or '∅'.

'Zero' must be established in every case where it is relevant if the model is to be applied consistently. We give a syllable /kaO/, for we can establish other syllables such as /kai/ and /kaiN/. The fact that in the statement of phonological form(s) I often give a form such as /ka/ does not mean that no account has been taken of the 'implosive' position. A representation such as /ka/ always presupposes a prior analysis /kaO/. It would be cumbersome to give a phonological form such as /kaO-uaO-ũN-kiO-saO-paO/ on every occasion that reference is made to phonological form, therefore I

1 I use '∅' everywhere except between slants. Between slants, '∅' is visually somewhat confusing.
give only /ka'uašuNkisapa/. The description according to (e, n, i) is always understood in such cases.

In this description, a sequence of phonemes such as /ui/ can represent two different phonological forms /uiO/ and /Oui/. In /uiO/, /i/ is in 'n', while in /Oui/, /u/ is in 'n'. Given that a syllable /Oui/*, with 'Ø' in 'e', is not a member of the syllable inventory of San Martín Quechua (there is always a phoneme in 'e' in such cases), the problem noted by Mulder for French houille and oui does not arise. In San Martín Quechua, it is always clear that /u/ is in 'n' in syllables such as /kui/, /mui/, /iui/. In a form such as /ki'ui/, the symbol ′ denotes the syllabic boundary therefore, in this case, it is clear that /u/ is in 'e', and not in 'n'. Where I see fit to make the nuclear phoneme absolutely clear, it is my practice to place a dot under that nuclear phoneme - in the case of /ui/, any ambiguity possible is removed by giving the forms /ui/ and /u\ˌi/.

As regards the definition of 'consonant' and 'vowel', the syllabic model enables us to define them. Those phonemes which can only occur in the peripheral positions (i.e. in 'e' and/or in 'i') are termed consonants. Those phonemes which can only occur in the nuclear position are termed vowels. Those phonemes which can occur in all three positions I term consonant-vowels or consonantal-vocalic phonemes. This latter term does not coincide with Mulder. Although I use the term 'consonantal-vocalic', I do not diverge from the theoretical view of Mulder. See Sets, p26.
and I shall explain why I feel that it is particularly appropriate. Returning to the set-theoretical representation of the classes 'C' and 'V', we have:

Fig.111

![Diagram]

The class 'consonantal-vocalic' is the intersection of the classes 'consonant' and 'vowel'. Set 'C' can occur only in 'e' or 'i'; 'V' can occur only in 'n'; 'CV' can occur in 'e', 'n' and 'i'. It follows from the model that the set '−C−V' does not apply to any functional element - no element comes neither in 'e', nor 'n' nor 'i'.

Now, I give a further diagram, in which I substitute for the general classes the specific class of phonemes in San Martín Quechua:
Following the set-theoretical pattern already laid down above, we have:

**Fig. IV.**

For the 'syllable' in Mulder's theory, see *Sets*, p26-8. For discussion of its application(s), see *Sets*, p177-81.
NEUTRALISATION AND THE ARCHIPHONEME /N/

1. The Nasal Series in 'e'.

For the description of the archiphoneme /N/, a partial description of the phonemes /m/, /n/ and /n̪/ is required. For a complete account of those phonemes, see VII.

In System A, /m/, /n/ and /n̪/ are opposed to each other in a functional way in 'e', as is shown by the set of forms - mama/nana /n̪a/na ("mother", "pain", "sister"). The distinctive features of /m/, /n/ and /n̪/, treating the phonemes as classes of distinctive features, may be given as follows:

<table>
<thead>
<tr>
<th>/m/</th>
<th>/n/</th>
<th>/n̪/</th>
</tr>
</thead>
<tbody>
<tr>
<td>{labial, nasal}</td>
<td>{apical, nasal}</td>
<td>{palatal, nasal}</td>
</tr>
</tbody>
</table>

This set of phonemes is opposed to all others in the system by virtue of being in the **nasal** series:

<table>
<thead>
<tr>
<th>voiced occlusive</th>
<th>unvoiced occlusive</th>
<th>nasal</th>
<th>sibilant</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td></td>
<td>m</td>
<td></td>
<td>u</td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>n</td>
<td>s</td>
<td></td>
</tr>
<tr>
<td>palatal</td>
<td>ʁ̃</td>
<td>ŋ̃</td>
<td>.IsEnabled = false</td>
<td>ɪ</td>
</tr>
</tbody>
</table>

/m n n̪/ are the only members of the **nasal** series in San Martín.
Quechua - [ŋ](velar nasal) is not a phoneme, but a realisation of either /n/ or /N/(depending on our choice of description).

The neutralisation established in this chapter can be described completely within the limits of the 'nasal' series. This series is termed the scope of the neutralisation. The neutralisation can be described fully by reference to that series, but is also limited to that series. The neutralisation has no implications for any other series in the system.

In 'e', /m/, /n/ and /ŋ/ are opposed to one another by the distinctive features 'labial' ∪ 'apical' ∪ 'palatal'. Set-theoretically, we have three classes (of distinctive features) which are disjoint (we have three different phonemes). This is illustrated by Fig.1 on p73, in which the intersection of the three classes (the intersection is the feature 'nasal'), which is empty in 'e', by virtue of the disjoint character of the classes in that position, is indicated but bracketed.

2. Distributional Unit and Neutralisation.

In I11, I pointed out that nasals may occur before other phonemes in the same accent group, which 'position' may be used as a context for a neutralisation hypothesis. The context for the proposed neutralisation is the succeeding phoneme (or in some cases 'zero', where the nasal is absolute-final in the accent group) in the same

---

1 Sets, p191.
accent group. In this scheme, we regard 'p' in [kämpa] as a context for 'm'; 't' in [kánta] as a context for [n], and so on.¹

The reasons for using the 'accent group' as a distributional unit must be clarified. If we apply a unit of three positions (the 'syllable' in Quechua), we have to posit something of the order of the following syllabification for the phonological form which is to describe [kämpa]:

/kán/ (one distributional unit) + /pa/ (one distributional unit)

The difficulty is that the generating context for the tentative

¹For the purpose of the classificatory calculus (p112 et seq), it is convenient to regard /N/ as occurring in 'i' of (e, ñ, i).
archiphoneme /N/ cannot be said to be /p/, for that phoneme lies outside the distributional unit in which the neutralisation is held to occur. A description of [kámpa] as two syllables /kaN/ plus /pa/ will not enable us to overcome the problem of the generating context, if we insist that the context is to be a phoneme such as /p/ in its position.

The only possible way to maintain the syllabification /kaN/ plus /pa/ is to have as the generating context, not a phoneme in its position, but the position itself in which the neutralisation is held to occur. In order to maintain /kaN/ + /pa/, we have to regard mere 'implosive' position as the context for the neutralisation, and not any subsequent phoneme in its position. This leads to some problems with forms such as [wámbra] and [ríiggri], where both [m] and [ŋ] occur. In fact, the mere occurrence of all kinds of nasal realisations in this position is unsatisfactory for the description which has 'i' as the only context for the neutralisation. Most important, this scheme has the counter-intuitive result of splitting up (irrevocably) into two different distributional units phonetic combinations such as 'mp', 'nt', 'ng'. This hypothesis distorts the speech facts and is unconvincing.

Before considering further possible approaches to the problem of the syllabification of [kámpa], I will list forms which exemplify the situation with nasals, which we have to solve here:
As I pointed out above, if we regard mere 'implosive' position as the context for this neutralisation, we make an inadequate description of Set-B(above).

Further possible solutions to the syllabification of [kampa] fail for several different reasons. Here are three possibilities:

1. ka + mpa
2. kamp + a
3. kamp + pa

Solution 1 requires that we posit a counter-intuitive syllable 'mpa', while also having to establish a series of bound syllables for clearly, in Quechua, 'mpa' can only figure if a syllable such as /ka0/ were to proceed it. This syllable 'mpa' is counter-

---

1Sets, p180.
intuitive, and I can see no justification for establishing bound syllables in Quechua. Quite the opposite, it is a notable feature of the language that a great number of instances of distributional units can combine in a great number of ways. We must reject Solution 2, as it stands (and it can only be modified to Solution 3), because there are no syllables of the form /a/ in this position in Quechua i.e. as an instance of a distributional unit succeeding another instance of a distributional unit. There are no forms such as /kak-a/*, where the second phoneme /k/ is in 'i', and the /a/ of the second distributional unit is in 'n'. It is just possible that we could establish a syllable 'kamp' as in Solution 3, and give also the syllable 'pa', after the fashion of English 'liking'\(^1\), where we establish 'lik' and 'king' in order to avoid an arbitrary decision as to the syllable to which /k/ should be assigned. This recourse again (like 1) requires that we establish bound syllables.

I believe that we must seek a hypothesis which describes the unity of groups like 'mq', 'nj' etc., and which does not split such groups into separate distributional units. I do not believe that 'bound' syllables are required in Quechua. If established, they can add nothing in the way of extra information to the description.

If we use the accent group as a distributional unit, this

\(^1\) Sets, p179.
preserves the unity of groups like 'mp', 'nt', 'ng', 'nɔ', 'nɔ',
'nɔ', and we may also attempt to describe Set B in a more adequate way
than is possible if we used mere 'implosive' position as the context
for the neutralisation (though, as I will show, Set B is problematic).

One immediate consequence of adopting this point of view is that
the forms of Set B cannot be held to partake in the neutralisation,
for there is no 'gap' in the inventory of nasals before /r/, /s/,
/i/ and /u/, with the possible exception of the absence of a phoneme
/ŋ/ (this is a different problem, to be treated separately - it is
a matter of distribution).

I will give the context of the neutralisation as one of the
phonemes /p t k m n ɔ ɛ ɔ/ following the nasal in the same
accent group.

I will proceed with this assumption to see if a satisfactory
neutralisation hypothesis can be reached with it.

In this context, the oppositions between 'labial' ~ 'apical' ~
'palatal' nasals do not hold. In this context, we do not have
disjoint classes of distinctive features /m/, /n/ and /ŋ/, but an
archiphoneme /N/. The archiphoneme /N/ is conceived according to
Fig.11. on p79, where the classes /m/, /n/ and /ŋ/, on this occasion
empty, are bracketed. The scheme of Fig.11. should be compared with
that of Fig.1. on p73.

The only feature any tentative 'nasal' phoneme can have in this
course is the feature 'nasal', as this is the only feature which
can be functional in this context. We cannot establish a phoneme /m/ in a form /kampa/* because, in the absence of an 'apical' (or 'palatal') nasal to which a tentative /m/ might be opposed, /m/* cannot be shown to be 'labial, nasal'.

It should be understood that having the notion 'archiphoneme' is one of the hall-marks of true functionalism. If one accepts that a phoneme is a simultaneous bundle of distinctive (i.e. oppositional or functional in the functionalist, not Jakobsonian sense) features, one must accept that if one finds somewhere else a different bundle of distinctive features, even if the phonetic realisation is the same, it would be inconsistent to regard that as the same phoneme. That is, 'labial nasal', realised [m] is not the same as 'nasal', realised [m]. The second is distinguished from the first by calling it the archiphoneme /N/. Most 'European' linguists recognise the need for a notion 'archiphoneme'. On the other hand, Bloomfieldians such as Parker have no difficulty in identifying [m] in [kampa] as a realisation of the phoneme /m/. Under a functionalist view, this phonological entity can have only the feature 'nasal', therefore it cannot be identified with the phoneme /m/, which has the features 'labial, nasal'. The most vociferous rejection of the

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1 See 11, 4, p33.

2 Note that while /u/ in the consonantal system has the features 'labial, vocalic', and in the vowel system has only the feature 'u-ness', it is the phoneme /u/ throughout. The different sets of features derive from different subsystems in which /u/ may figure. There is no reason why 'labial, nasal' /m/ should not figure in the subsystem which has the archiphoneme /N/.

3 1965, p17.
dictum 'once a phoneme, always a phoneme' has been provided by Martinet.¹

Mulder defines the 'archiphoneme' as:

"... a phoneme in a subsystem which, when projected into the over-all system, is represented there by two or more phonemes."²

The subsystem in which the archiphoneme /N/ occurs in this hypothesis is 'the set of phonemes preceding /p t k m n ñ ç š/ in the same accent group'. This archiphoneme has only the feature 'nasal' — it is represented in the over-all system by the three

¹"Realism versus Formalism", p7.
²Sets, p114.
phonemes /m/(labial, nasal), /n/(apical, nasal) and /ŋ/(palatal, nasal). The archiphoneme /N/ does not figure in the over-all system, but is represented there by the three phonemes /m n ŋ/.

Mulder's 'archiphoneme' differs from that of Martinet in that the former regards the archiphoneme as being included in each of its terms - /N/(nasal) is included in each of /m/(labial, nasal), /n/(apical, nasal) and /ŋ/(palatal, nasal). Martinet, on the other hand, regards the archiphoneme as including each of its terms. Martinet would regard /N/ as 'covering' /m/, /n/ and /ŋ/.

A neutralisation which is linked with concord is termed a strong neutralisation. The neutralisation under discussion here is 'strong', because of the phonetic harmony involved in 'mp', 'nt', 'ng' and so on.1

If we describe the forms [kimsa], [tāmjā], [wām b ra] and [zāgwa] of Set B, there can be no neutralisation of nasals in the contexts /-r, -s, -i, -u/. In the absence of a functional opposition, we rely on distinctive features to establish a phoneme /m/ in /tamia/, /kimsa/, /uamra/, and phoneme /n/ in /zanua/. The realisation of /uamra/ is [wāmbra] or [wam b ra](the prominence of [b] varies). The [b] may not be ascribed phonemic status, as it has no distinctive function, nor does it have any identity apart from [m]. Following Mulder, I call it a parasitic consonant.2 The same goes for [g] in [zāgwa] and [rfŋri]. It has no phonemic status, and is termed parasitic.

1Sets, p205.
2Sets, p203.
There remains to be considered the non-occurrence of a palatal nasal before /r s i u/. Only /m/ and /n/ may occur. The non-occurrence of /ñ/ before /r s i u/ may be adequately accounted for by a distributional rule.

The above hypothesis is consistent and adequate. Nevertheless, one fairly serious problem has to be cleared up in connection with Set B. I believe that the above hypothesis can be put forward, but it is perhaps not so simple as another which is also possible. I will explain the difficulty. The moneme for "2nd person" in San Martín Quechua will now have three forms:

/kan/
/kam/
/kaN/

The form /kan/ comes when "/kan/, /kam/, /kaN/" is combined with the moneme "/ra/" for example (in context / -r/); the form /kam/ comes when this moneme is combined with the moneme "/uαN/" for example (in context / -u/); /kaN/ comes when this moneme is combined with the moneme "/pa/" for example (in context / -p/). Similarly, the moneme for "path" will have the three forms /ña/, /ñam/ and /ñaN/, depending on the form of the moneme following. None of the phonemes /r s i u/ is regarded as a context for a neutralisation of nasals in the hypothesis given, because both [m] and [n] may occur before those phonemes. The inclusion of the forms [kǐmsa], [tǎmja], [wǎmpra] and [zǎŋga] means that we have to restrict the context for the
neutralisation - one result of this is that "2nd person" has three forms /kan/, /kam/ and /kan/, and that we have to devise a morphophonological 'rule' to explain where any particular form of this moneme occurs.

If we omit from consideration the forms [wám⁶ra], [támja], [kímsa] and [zám⁶wa], there is no need to restrict the context of the neutralisation as before. Omitting these four forms, we may give the context of the neutralisation as any phoneme which follows the nasal in the same accent group. The four forms cited above are the only ones where the establishment of /m/ and /n/ is obligatory.

We must seriously consider whether it is worthwhile to insist on accounting for these four forms, when their inclusion complicates the description to such a high degree. The complication is considerable, for only in the one case of the formal element /ni/¹ does San Martín Quechua demand that we formulate a morphophonological 'rule'.

The best way to characterise /m/ before /r/, for example, is to call it 'unproductive'.² It does not operate freely in that position. This is an intuitive description of /m/, but it applies to some palpable reality in the description of speech facts. There are some further consequences of establishing a phoneme /m/ in the three forms cited above:

1. By virtue of the fact that /m/ occurs in a position in the language('implosive' position), it has exactly the

¹ See p178-83.
² Martinet (EGL, 6.5) would state that /m/ 'conflicts with linguistic economy'. 
same paradigmatic potential as, say, /k/ in the same position. This potential is not realised.

2. The element /m/ must be included in the classificatory calculus in the same way as any other element in the system. Here, indeed, it would represent a marginal factor, occurring in only three forms¹ in the system: /tamia/, /uamra/ and /kimsa/.

3. The elements /m/ and /n/ are not opposed to one another by any minimal pair - this argues for the unproductive character of /m/ and /n/ in this context.

Our choice is between the following two statements A. and B:-

Statement A: /N/ occurs before /p t k m n ñ ñ 0/ in the same accent group; /m/ and /n/ occur before /r s i u/ in this context.

Statement B: /N/ occurs before any phoneme in the same accent group; /uamra/, /kimsa/, /tamia/, /Zanua/ are marginal.

At this point, we appear to have reached the point where non-arbitrary criteria are exhausted. If we are prepared to treat /uamra/, /tamia/, /kimsa/ and /Zanua/ separately, we can make the following statement which is intuitively satisfactory:-

There is a neutralisation between nasals of all orders before any phoneme in the same accent group.

¹I exclude tentative allomorphs such as /kan/, /kam/, /kaN/.
The alternative is to maintain the four forms cited, and tolerate a morphophonological rule which explains /kan/, /kam/ and /kan/ as phonological forms of the moneme for "2nd person".

Intuitions tell us that we should not have recourse to the more complex hypothesis, but strictly speaking I can find no non-arbitrary grounds, as far as consistency and adequacy are concerned, for regarding one hypothesis as preferable to the other.

3. The Appeal to a Simplicity Criterion.

There is little to choose between Statements A and B (above) as far as consistency and adequacy are concerned. I accept, of course, that it may not always be possible to decide such matters in a satisfactory way - it may be quite impossible to decide them in an absolutely clear-cut way. For this reason, I believe that one should have a fairly rigorous criterion of simplicity on which to fall back in cases of doubt.

Mulder (p206) chooses not to formulate a criterion of 'simplicity' in his theory, preferring to regard 'simplicity' as an intuitive criterion. I follow Popper in regarding 'the most simple hypothesis' as 'the most easily testable hypothesis'.¹ This rigorous formulation has an intuitive reflection in 'the most easily understandable hypothesis', given that for a statement to be easily testable, it is a requirement that it be understandable - if it is easily understandable, so much the better. As I said in 1, 5, one should not strive

¹ *Logic*, p136-42.
for simplicity at the expense of consistency and adequacy. Between
two statements which we judge to be equally consistent and adequate
(i.e. between which we cannot trace any difference in the matters
of consistency and adequacy), we opt for the statement which is the
simpler - i.e. for the statement which is more easily testable.

On the basis of this criterion, I believe that we can choose
between Statements A and B. I opt for Statement B, for we shall know
very quickly whether Statement B is wrong. It can be refuted in a
direct and simple way by showing that /m/ in 'i' is productive -
i.e. by showing that there are forms in the language where /m/ as
opposed to /n/, before /r s i u/, is crucial, and that there is
a sufficient number of such forms to merit a rejection of Statement
B(which regards such forms as marginal). Statement B is more easily
testable. Statement A allows for productivity of /m/ as opposed to
/n/ in forms such as /uamra/ etc., therefore can only be refuted by
showing non-productivity.\(^1\) This statement is much more difficult to
test than is B, which asserts non-productivity. Popper, I believe,
would regard Statement B as of higher status than Statement A, given
that it rules out more basic statements\(^2\), thereby asserting more
about the data. By doing so, however, it throws itself more open to
refutation than does Statement A which is, I believe, a 'safer'
hypothesis.

\(^1\) The distinction between /m/ and /n/ is potentially productive - we
can say no more than that on the basis of my data.

\(^2\) *Logic*, p112-3.
If we adopt Popper's simplicity criterion, we can attribute more importance, I believe, to the appeal to such a criterion than if we use an intuitive criterion. The criterion may help us, not only to choose the simpler of two statements, but to choose the more powerful of two statements, particularly in difficult cases where we are faced with which display a certain imbalance, necessitating a difficult decision between two hypotheses. It is not always easy in such cases to choose between two hypotheses on the basis of consistency and adequacy alone. A simplicity criterion as formulated here provides a safe-guard - by opting for the more easily testable statement, we reduce the likelihood of a less than adequate statement persisting at the expense of a better one. This is so, because we have chosen the more easily testable of two statements (and, hence, the more quickly refute-able, if wrong). It is much better to make a statement of this kind than to blunt progress in a science by formulating hypotheses which are in principle irrefutable. An irrefutable hypothesis has no particular merit.¹

Martinet's 'marginality' criterion, in general, when applied, leads to statements which are easily testable, in contra-distinction to statements of Bloomfieldians, who insist on achieving wide coverage of the data at all costs. Repeating Haas:

"...whenever an approach is found wanting, another is adopted...This is a way of securing empirical completeness at the expense of consistency."²

¹For example, Popper's 'it may or may not rain tomorrow', Logic, p41.
²"Linguistic Structures".
We may add that the practice of mixing principles of analysis in order to achieve wide coverage of the data renders a statement very difficult to test, for one can never be quite sure where one principle of analysis ceases to operate and another takes over. I agree with Popper that science needs straightforward unambiguous statements which can be tested.\footnote{Logic, p36.}

Throughout this description, we shall have to face further cases where a large majority of the forms in the data can be described in a Statement $S$, but where a small set of forms resist such description. In such cases, provided that we are reasonably sure that a Statement $S$ is consistent and adequate, we should maintain that statement, and list the remaining elements as marginal. Our assertion that such forms are marginal is, of course, open to refutation like all other assertions in the description. By adopting such a procedure, we produce 'simple'(easily testable)statements while, if we adopt Statement $T$ which attempts to cover all the data OR we maintain Statement $S$ in rough outline but add to it a further description of the marginal elements via new criteria, we may achieve completeness in coverage of data, but at the cost of blurring the outlines of the statement as a whole.

I maintain that Martinet's functional principle is very useful - what is really worth stressing is that its use is in no way an escape route from difficulties. On the contrary, it throws state-
ments into clear relief and makes them easily testable.

4. Summary.

My statement may be exemplified by the following phonological forms, together with their realisations:

- **p**  kάNpa  [kάmpa]
- **t**  kaNta  [kάnta]
- **k**  kaNka  [kάŋga]
- **m**  kaNmaN  [kάŋman]
- **n**  kaNna  [kάŋna]¹
- **ž**  kaNža  [kάŋža]
- **č**  kaNčis  [kάŋčis]
- **r**  kaNramJ-  [kigrými]
- **s**  ŋaNsapa  [ŋáŋsápa]
- **š**  ti'iaNši  [tijáŋši]
- **i**  ŋaNiuk  [ŋáŋjuk]
- **u**  ŋaNuaN  [ŋáŋwaŋ]

The context for the neutralisation is the succeeding phoneme in the same accent group. Only /ñ/ is excluded from being such a context, by a distributional restriction.

The forms /uamra/, /tamia/, /žanua/ and /kimsa/ are described in an ad hoc way.

The adoption of Statement B as opposed to Statement A does not

¹In this case, there is gemination of the nasal realisation.
affect certain contingent conclusions reached in connection with Statement A. The neutralisation is still termed 'strong', and the item [b] in [wambra], together with the [g] in [rintri] and [xangwa] are still termed parasitic consonants in Statement B.

5. Spanish Forms.

In the mestizo Spanish of Sisa, there is a similar neutralisation of opposition between nasals in conjunction with a succeeding phoneme in the same accent group - /anco/ "wide"; /pan/ "bread"; /nilna/ "nymph"; /andaR/ "walk"; /anpoza/ "injection"; /cinbar/ "cross over"; /zanta/ "tyre"; /brinkaR/ "leap" and so on.

This is not an argument for establishing /N/ in 'Spanish forms' in Quechua, but given this condition it is not surprising that the question of nasals in contexts such as /-p/, /-t/ and /-k/ etc., is not a problem when we come to describe 'Spanish forms' in System B. 1 In 'Spanish forms'(or loans), nasals are neutralised as elsewhere in the system:

/blinik/ "leap"
/plantanu/ "banana"
/kaanta/ "sing"

The simplicity of the synchronic description of nasals in this position in 'Spanish forms' is intuitively related to the fact that in both Spanish and Quechua there is a neutralisation between nasals

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1 As we proceed with the description, we shall find that such simple solutions to the phonological form(s) of Spanish loans are the exception rather than the rule.
before another phoneme in the same accent group.
FREE AND COMBINATORY VARIANCE IN SYSTEM A

1. Realisations of /p/. ¹

In System A, [p] and [b] occur in free variance as realisations of /p/ after a nasal at the end of the accent group. In the following list of examples, 'or' denotes 'varies freely with':-

/ukuNpi/ : [ukúmpí] or [ukúmbi] "inside it"
/uasiNpi/ : [wasímpí] or [wasímbi] "in his house"
/mañanaNpi/ : [mañašmpí] or [mañašmbi] "by the side of it"
/tataNpa/ : [tatšmpa] or [tatšmba] "his father's"
/sa'uaNpi/ : [saawšmpí] or [saawšmbi] "on top of it"
/kaNpa/ : [kašmpa] or [kašmba] "yours"
/rinaNpa/ : [rinšmpa] or [rinšmba] "so he may go"

The occurrence of [b] after [m] in forms such as these is not common, but when it does occur it is unmistakeable. The realisations [b] and [p] alternate on occasion in a non-functional way in data collected from one and the same speaker, therefore there is no question of [b] occurring in the speech of one speaker, but not in that of another. Of the realisations [p] and [b] of /p/, [p] is much more common. The description we must make is to establish [p] and [b] as free variants, given the description we are making, in System A, without minimal pairs which resemble mestizo Spanish forms. In a

¹ It should be noted that I anticipate a later description (in IX), which establishes the items under discussion as phonemes.
later chapter, I shall discuss fully the implications of a phoneme /b/ in the system as far as the variance established here is concerned. In IA(following), a short note on these implications is given.

There are further cases of [b] after a nasal where there is no possibility of variance with [p]. I refer to the following forms:

- [ˈzimba] "roof"
- [tɪmbu] "boil"
- [ˈčuambi] "belt"
- [tʊmbu] "variety of fruit"
- [ˈčimba] "cross a river"

This group of forms constitutes a descriptive problem in System A. We cannot establish /b/ in this position (except in an ad hoc way), because [b] is not opposed to [p] in a functional way. The pair [zimba]/[činga]* will not do, because it does not enable us to set up 'voice' as a feature of a tentative /b/ phoneme. In addition, [g] is not the realisation of a phoneme /g/ in System A, but a combinatorial variant realisation of the phoneme /k/. We require a pair something like - čiNba/čiNpa*, but no such pair is to be found. On the other hand, [b] and [p] are not in free variance in these forms, because we always have [b]. We could treat [b] in an ad hoc way, and establish an ad hoc phoneme /b/ in order to account for the data. Such a tentative ad hoc phoneme would not be functional.
In view of this, I see no reason why we should not merely give a phoneme /p/ here, and list the forms where only [b] may occur as the realisation of /p/. This is a very simple hypothesis, which brings none of the consequences of a phoneme /b/ in the system (see 1A below).

There may well be an historical explanation for this set of forms. Of course, such an explanation does not enable us to solve the synchronic problem, nor can such an explanation be used for this purpose.

In establishing a phoneme /p/ to account for the set of forms which have only [b], we explain that there is no opposition between 'voiced' and 'unvoiced' labial occlusives in this position in System A. By listing the forms where [b] only occurs, we have described them, albeit in a very limited way. It may not be possible to do better than this, without allowing a counter-intuitive phoneme /b/ in the system. To have /p/ and /b/ in System A suggests that there is an opposition between 'voiced' and 'unvoiced' labial occlusives in the system, which is contrary to the speech facts in general. It could only be held, if anything, to apply to a minuscule set of forms. In spite of applying only to this small set, /b/ would figure in the over-all system as one element.

1A. A Short Note on a Tentative Phoneme /b/.

If a phoneme /b/ after nasals in System A were established, we should have to modify the above description of free variance between
[\text{p}] \text{ and } [\text{b}].

The over-all system with a phoneme /b/ would be as follows:

<table>
<thead>
<tr>
<th></th>
<th>voiced occlusive</th>
<th>unvoiced occlusive</th>
<th>nasal</th>
<th>sibilant</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>\text{b}</td>
<td>\text{p}</td>
<td>\text{m}</td>
<td></td>
<td>\text{u}</td>
</tr>
<tr>
<td>apical</td>
<td>\text{t}</td>
<td></td>
<td>\text{n}</td>
<td>\text{s}</td>
<td></td>
</tr>
<tr>
<td>palatal</td>
<td>\text{\textipa{\text{-}}}</td>
<td>\text{\textipa{\text{-}}}</td>
<td>\text{\textipa{-}}</td>
<td>\text{\textipa{-}}</td>
<td>\text{\textipa{-}}</td>
</tr>
</tbody>
</table>

We could state that /\text{p}/ \text{ may have free variant realisations } [\text{p}] \text{ and } [\text{b}], \text{ but that } /\text{b}/ \text{ may be realised only } [\text{b}]. \text{ That is, } /\text{p}/ \text{ may vary to } [\text{b}], \text{ but } /\text{b}/ \text{ may } \text{not vary to } [\text{p}]. \text{ Alternatively, we could state that forms such as } /\text{tataNpa}/ \text{ and } /\text{tataNba}/ \text{ are the forms of two synonyms for "of his father", treating the variant for } [\text{b}] \text{ as in } [\text{tat\'amba}] \text{ as a realisation of the phoneme } /\text{b}/. \text{ We should have to choose between these two alternatives by way of } \text{simplicity criteria.}

I maintain that it is preferable in System A to recognise the five forms where only [\text{b}] occurs as marginal, as suggested in 1(above).

2. Realisations of /t/.

In System A, [\text{t}] and [\text{d}] occur as \text{free variant realisations of the phoneme } /\text{t}/, \text{ after a nasal at the end of the accent group.}

Here are some examples:

/\text{\textipa{\text{\textipa{-}}}aim\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}nta}/ \text{ [\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}aim\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}nta} \text{ or } [\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}aim\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}nda}] \text{ "therefore"}

/\text{\textipa{\text{\textipa{-}}}is\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}m\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}nta}/ \text{ [\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}is\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}m\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}nta} \text{ or } [\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}is\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}m\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}nda}] \text{ "from Sisa"}

/\text{\textipa{\text{\textipa{-}}}ta\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}m\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}nta}/ \text{ [\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}ta\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}m\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}nta} \text{ or } [\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}ta\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}m\text{\textipa{-}}}\text{\textipa{\text{\textipa{-}}}nda}] \text{ "his father(O)"}

\text{1By } '(O)', \text{ I denote the fact that this form means "his father(object)".}
/kánta/ [kánta] or [kánda] "you(O)"
/karánta/ [karánta] or [karánda] "its skin(O)"

As in the case of [b] in 1(above), [d] occurs only rarely in this position. It can co-occur with [t] in data collected from a given speaker. It is not possible to establish a phoneme /d/ here, because no distinctive function can be attributed to a tentative phoneme /d/ in this position. This is mere free variance.

There are no cases of [d] comparable to that of [b] in a form such as [Símba] i.e. there are no forms where only [d] comes. Such instances occur only in 'Spanish' forms, and are part of the subject-matter described by System B, not System A. 1

3. Realisations of /k/.

The realisations [k] and [g] can be established as combinatory variants of /k/ after nasal at the end of an accent group. The element [g] is also a combinatory variant realisation of the phoneme /k/ when it comes before /z/ in the same accent group. Firstly, I shall deal with the situation after nasals in the same accent group.

If we take a partial inventory of occlusives(labial, apical, dorsal) in the following contexts:

a. not after a nasal [ŋ] in the same accent group
b. after a nasal [ŋ] in the same accent group

we find the following realisations:

1 There is always a problem for diachronic statements such as this, when we come to a form such as [puñundéro] where [puñu] is 'Quechua' and [ndero] is 'Spanish'. [d] comes only with the Spanish suffix, therefore I treat [puñundéro] as a 'Spanish form'.
The realisation [k] does not figure in the context /nasal- / at the end of the accent group, nor does [g] figure in the context /i- /. That is, in their respective contexts, [k] and [g] are mutually exclusive. We find no instances comparable to [káîga]* or to [kánka]*.

We cannot establish a phoneme /g/, which tentative phoneme would have to have the features 'dorsal, voiced, occlusive', for there is no way of showing that 'voiced' is a feature. The item which is established can only have the features 'dorsal occlusive'. This reasoning bears a certain resemblance to that of Martinet, who would say that the relations of [k] and [g] to their respective inventories are in this case the same:

\[
\begin{array}{c|c|c}
p & t & k \\
p & t & g \\
\end{array}
\]

Martinet\(^1\) explains 'combinatory variance' as follows, with reference to Castilian [ð] and [d]:

\(^1\)EGL, 3.16.
"We speak of combinatory variance when we take note of the difference in the manifestations of one and the same phoneme in different contexts; that is to say, when the difference is so striking that it could lead, as in the case of Spanish [S] and [d], to non-identical descriptions."

It should be noted that the realisations [k] and [g] could not possibly be in *free* variance, for there is no question of one realisation occurring in the context which is the domain of the other. Note that [p] or [b](free variants) and [t] or [d](free variants) occur in the same context.

This description of [k] and [g] means that our statement of certain phonological forms assumes a shape quite different from Bloomfieldian statements:

<table>
<thead>
<tr>
<th>Bloomfieldian</th>
<th>Functionalist</th>
<th>&quot;door&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>/pungu/</td>
<td>/puNku/</td>
<td>&quot;and you&quot;</td>
</tr>
<tr>
<td>/kanga/</td>
<td>/kaNka/</td>
<td>&quot;heart&quot;</td>
</tr>
<tr>
<td>/sungu/</td>
<td>/SuNku/</td>
<td>&quot;you(plural)&quot;</td>
</tr>
<tr>
<td>/kanguna/</td>
<td>/KaNkuna/</td>
<td>&quot;leaf&quot;</td>
</tr>
<tr>
<td>/panga/</td>
<td>/paNka/</td>
<td>&quot;illness&quot;</td>
</tr>
<tr>
<td>/ungu/</td>
<td>/uNku/</td>
<td>&quot;nose&quot;</td>
</tr>
<tr>
<td>/senga/</td>
<td>/siNka/</td>
<td>&quot;pot&quot;</td>
</tr>
<tr>
<td>/manga/</td>
<td>/maNka/</td>
<td>&quot;leg&quot;</td>
</tr>
<tr>
<td>/čanga/</td>
<td>/čaNka/</td>
<td></td>
</tr>
</tbody>
</table>
The occurrence of only [g] after nasal in the same accent group in System A gives us one strong argument for disregarding instances of [k] in this context as not part of the system (they can only be described in System B). All instances of [k] after a nasal in the data correspond formally with mestizo Spanish. In System A, if we choose to describe a form such as [bríŋkə] at all, we must do so in an ad hoc way.

3A. The Phoneme /k/ Before /z/.

In two forms in the data, a realisation [g] occurs before [z] in the same accent group:

[ágəa]  "choose"

[wagətʃi]  "do harm to"

It is not possible to establish a phoneme /g/ here for reasons wholly analogous to those given in 3(above). In this context, we establish [g] as a combinatory variant of /k/.

3B. The Phoneme /k/ in 'i'.

In 'i', the 'occlusive' realisation [k] of the phoneme /k/ is attested in a great many cases, but, in addition, we have cases where a fricative [x] occurs. The latter realisation is the exception rather than the rule.

As there is no question of these two items being opposed in a functional way, this is treated as free variance.
4. A Phonetic Correlation.

This dialect of Quechua is unusual among Peruvian dialects in having the phonetic correlation:

<table>
<thead>
<tr>
<th>p</th>
<th>t</th>
<th>k</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>d</td>
<td>g</td>
</tr>
</tbody>
</table>

The realisations [b], [d] and [g] after nasal are attested also in the Quechua of Ecuador.¹

I must register what I believe to be an error of Torero (1964), who asserts that [b] and [d] after nasal are a feature of Lamas Quechua. These realisations occur only in the Quechua spoken in Sisa, and in neighbouring towns such as Huaja and Chumbaquihui.

None of the forms in which [b, d, g] occur as variants of /p t k/ has formal characteristics similar to mestizo Spanish. This is a feature par excellence of the Quechua system.

5. Realisations of /u/ and /i/.

As explained in IV, we describe [w], [u] and [u̯] as combinatory variants of /u/ in 'e', 'n' and 'i' respectively. This is because the oppositions [w] ~ [u] ~ [u̯] cannot be demonstrated to obtain in a syllable of the type (e, n, i), which uses the notion 'position'.

The realisations [j], [i] and [i̯] are treated as combinatory variants of the phoneme /i/ in 'e', 'n' and 'i' respectively. This is because the oppositions [j] ~ [i] ~ [i̯] cannot be shown to obtain in a syllable of the type (e, n, i).

¹See p176-8.
6. Realisations of /\tilde{z}/.

The phoneme /\tilde{z}/ is realised either [\tilde{z}], [\tilde{t}^j] or [\tilde{I}]. The realisation [\tilde{z}], palatal voiced 'hush' (rather like French 'jour') occurs in both 'e' and 'i'. The realisation [\tilde{t}^j], palatal lateral plus semi-vowel (rather like Castilian 'llevo') occurs in 'e' only; this is one of the realisations of San Martín Quechua which may be termed typically 'explosive', the other being the palatal nasal plus semi-vowel [\tilde{N}^j]. The realisation [\tilde{I}] is similar to [\tilde{t}^j], but is typically 'implosive', lacking the 'explosive' [\tilde{J}] of [\tilde{t}^j] - it may be termed simply 'palatal lateral'. Of the three realisations singled out, [\tilde{z}] is by far the most common in both explosive and implosive positions.
TWO INSTANCES OF 'VARIANCE' IN NUCLEAR POSITION

The problem of the apparent variance of [o] or [u] and of [e] or [i] has not been broached in any depth in existing descriptions of Quechua. It is indeed a problem of considerable difficulty.

The situation may be summarized as follows. While some forms always have the realisation [u], and some always have the realisation [o], some forms may have either [u] or [o]. The situation is almost wholly analogous for [e] or [i], but I shall take [u] or [o] first.

Diachronically speaking, some (but not all) instances of 'o' in Spanish loan-words are being assimilated to Quechua 'u'. However, in certain cases, 'o' is resisting assimilation e.g. 'polbo' or 'polbu' may occur, but there is no instance of 'pulbo' or 'pulbu'.

In those cases where assimilation may occur, the occurrence of [o] and [u] is largely unpredictable. We can speak only of sporadic assimilation. The process of assimilation to Quechua 'u' is proceeding in an erratic fashion, and may in fact not reach the expected stage where all cases of Spanish 'o' are assimilated to 'u'. It is not possible to make the diachronic argument much clearer than the above. The resulting situation is difficult for the synchronic description but, as I hope to show, not difficult out of all proportion.¹

¹ Mulder, Sets(208), cites a similar problem in Pekingese: "Diachronically, many (and probably most) of the expressions having untoned syllables as their phonological forms are the reflections of more..."
I divide the forms into three sets:

A. Always realised [u] : núnga  
Púka  "door"  
Kúru  "red"  
Kíru  "worm"  
Suk  "tooth"  
Ñúka  "one"  

B. Always realised [o] : pólbo  
Mósó  "smash"  
Kórtte  "merchant"  
Poróto  "tribunal"  
Sol  "bean"  
Polbóra  "one sol piece"  

C. Realised either [o] or [u] : súkta/súkta  
Iskon/Iskun  "six"  
Peso/Pésu  "nine"  
Indjo/Indju  "scale"  
Trósó/Trósu  "Indian"  
Álto/Áltu  "piece"  

In Set A, there is no difficulty in setting up a phoneme /u/ — the forms are diachronically 'Quechua' in nearly all cases, and there

Cont. from pl01...and more conventionalized suspensions of fully distinctive realisations of originally toned phonological forms of those expressions. This process is still going on.
are many Spars for a phoneme /u/ e.g. kiru/karu/kuru ("tooth", "the distance", "worm").

In Set B, I see no reason for giving other than a phoneme /o/. In System A, this can only be done in an ad hoc way, for the minimal pairs which serve to identify /o/ are all formally similar to mestizo Spanish forms. This is not to say that the instances of /o/ are confined to 'Spanish' forms - the form /poroto/, for example, which is diachronically 'Quechua', is always realised as [poróto]. Our problem does not come with this set, but with Set C. It is important to note that our conclusion for Set C depends on the establishment (or non-establishment) of a phoneme /o/ (albeit in an ad hoc way). In the absence of a refutation of the phoneme /o/ in Set B, I shall proceed to Set C on the assumption that there are phonemes /o/ and /u/ in this description. Note that the fact that /o/ in System A is an ad hoc phoneme does not affect the issue as far as Set C is concerned - we still have to identify which realisations are of the phoneme /u/ and which are of the ad hoc phoneme /o/. If we adopt the procedure of System B, the pair -CORO/ʃuru ("monkey"/"snail") serves to identify /o/ as a fully-fledged phoneme separate from /u/.

I will discuss two hypotheses for Set C. The same arguments can be taken over into System B, the only difference being that there /o/ is not an ad hoc phoneme, but a fully-fledged phoneme /o/.

The same solution holds for both Systems A and B.

1For Spar(strict paradigm), see Sets, p125.
Hypothesis 1: we could establish a phoneme /o/, and state that /o/ may vary to [u]. We would further state, if we adopted this view, that in those cases where /o/ is realised [u], the upper limit of the distinctive realisation of /o/ is suspended. The realisation of /u/ may be said to have the features (phonetic, not distinctive) - 'rounded, close', while the phoneme /o/ in its normal distinctive realisation has the features 'rounded, half-close'. Limiting ourselves in the inventory of vowel phonemes to those elements which are 'rounded', we may note that /o/ is opposed to /a/ and /u/. The upper limit of distinctive realisation of /o/ is 'half' of 'half-close'. As soon as /o/ is realised 'close', and not 'half-close', that upper limit of distinctive realisation is suspended, because the realisation is no longer distinctive with respect to the realisation of /u/, which is also 'close'. Therefore, in those cases where /o/ is realised [u], the upper limit of its distinctive realisation is suspended.

There are two problems for this hypothesis which may be singled out here:

1. There is an arbitrary element involved in giving the phoneme as /o/, and not as /u/. Although a phoneme /o/ is intuitively more satisfactory, given that most of the forms in which either [o] or [u] may occur are 'Spanish' forms (in Spanish the forms have /o/), I can find no way of demonstrating that the phoneme must be /o/ in a tentative form such as /sokta/.

---

1 See Sets, p182.
which may be realised [sőkta] or [sůkta].

2. If we make an arbitrary decision to describe [o] and [u] as realisations of /o/, we still have the problem of deciding on a statement as to which instances of /o/ may be realised [u] - we must provide a criterion of demarcation between Sets B and C. The same problem would occur if we were to give a phoneme /u/ - only in this case we would have to provide an explanation of which instances of /u/ may be realised [o].

There seems to be no ready solution which removes the arbitrariness involved in stating that either /sőkta/ or /sůkta/ is the correct phonological description of [sőkta, sůkta], nor of any other form like this.

Hypothesis 2: as is the case with Hypothesis 1, it does not affect the issue whether the phoneme /o/ is established in an ad hoc way (System A) or via a minimal pair (System B).

Given that /o/ and /u/ are different phonological forms, we could describe "/sőkta/" and "/sůkta/" as synonyms for "six". We would thus be treating the description of "/sőkta/" and "/sůkta/" in Quechua as analogous to English "/Rɪɾ/" and "/aiʃɪɾ/" as synonyms for "either". This solution has two advantages:

1. It removes the arbitrary choice between /o/ and /u/.

2. It gives wide coverage of the data (without in any way
conflicting with consistency), while also removing the need for a criterion of demarcation between Sets B and C.

The only disadvantage is a pragmatic one. This hypothesis is rather inelegant. Synonyms have to be given in several cases where it may seem 'simpler' to have only one phonological form. However, this pragmatic disadvantage is a small price to pay for our gain in consistency, adequacy and non-arbitrariness. As to the question of 'simplicity', that criterion is not to be observed over and above considerations of consistency and adequacy.

When further research has been done on San Martín Quechua, it may well be found that "/sokta/" for "six" is used by a particular set of speakers, while "/sukta/" is found to be used by another set of speakers. If my intuitions prove to be near the mark, it will be found that "/sukta/" is more common among Spanish-speaking Quechuas and among mestizos who know Quechua. Of the two forms, "/sokta/" appears to be much more common among pure Quechua speakers, while mestizos generally use "/sukta/". This is a somewhat unexpected hypothesis, given that the Quechua vowel system par excellence is /a i u/. The form "/sokta/" is one of a very small set of 'Quechua' forms which has /o/. In order to clarify these matters, a great deal of very painstaking statistical research is required - here, I can only hint at general patterns. Roughly, the following scheme seems to hold for forms which have /o/(either 'Quechua' or 'Spanish' in the
diachronic sense). In the scheme, /o/ denotes use of a synonym with /o/, while /u/ denotes use of a synonym with /u/:

<table>
<thead>
<tr>
<th>'Quechua' words</th>
<th>'Spanish' words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quechuas</td>
<td>/o/</td>
</tr>
<tr>
<td>mestizos</td>
<td>/u/</td>
</tr>
</tbody>
</table>

Quechuas will prefer "/sokta/" to "/sukta/", but "/pesu/" to "/peso/" ('Spanish' form). That is, they assimilate loan-forms to the Quechua pattern /a i u/. Mestizos will generally use the form with /u/ in cases such as "/sukta/", and will be unpredictable in their choice of synonym for Spanish loan-forms. The above may find an explanation in the mestizo's intuitively observable habit of converting loan-forms to the Quechua pattern — this conversion, however, is not one hundred percent consistent. One would have to investigate a very large (perhaps prohibitively so) number of cases like this before hazarding a fully-fledged hypothesis concerning the usage of /o/ and /u/-synonyms by given sets of speakers. The kind of phenomenon which I have described roughly above is as difficult to formalize into a hypothesis as the usage of "/R̃r/" and "/ai̯r/" as synonyms by English speakers. It is very difficult to describe. 1

As far as the structural description of the present data is con-

1Such matters have an indirect, but nevertheless important, bearing on synchronic description. If we were to attempt to describe data in English collected from England and Scotland together, we should come up with two synonyms "/ɛ/" and "/ai/" for "I". By the criterion of sets of speakers, however, we should come to realise that each form belonged to its own system, used by a given set of speakers — we should then cease to treat the data in terms of one system.
cerned, we shall maintain the hypothesis for /o/ and /u/-synonyms.
There is some evidence (but not sufficient to enable us to solve the
problem) that the use of one or other synonym may be explained with
reference to groups of speakers. In the event of this being the case,
the 'synonymy' hypothesis is likely to be much better than that
description which attempts to cover all the data by either an arbitrary
phoneme /o/ or by an arbitrary phoneme /u/.

If we adopt the synonymy description, some simplification procedure
for representation is required to lessen the burden of stating all
the synonyms of a form at every stage of the description where
reference is made to one of the synonyms, or, alternatively, to
do away with the need to pick one out of the total set of synonyms
in a given case. I shall adopt the following convention for brevity:
where there are two forms such as "/sokta/" and "/sukta/" for "six",
I shall give "/sökta/", where the umlaut over 'ö' indicates that
another form exists which has a phoneme /u/ instead of /o/. These
forms will always be represented with /o/.

The situation for [e] and [i] is similar to that discussed above.
As before, we have three sets of forms:

A. Always realised [i] : kírú "tooth"
    íntí "sun"
    sipi "drown"
    fòkài "two"
The statement that in Set C the upper limit of the distinctive realisation of either /e/ or /i/ (depending on which we give) is suspended, is beset by the same problem as the similar hypothesis for /o/ (pl04). It involves an arbitrary decision in favour either of a phoneme /e/ or of a phoneme /i/. Accepting that Set A (above) may be described by a phoneme /i/, and Set B by a phoneme /e/ (albeit an ad hoc phoneme), I shall give "/xeNte/", "/xeNti/" and "/xiNti/" as synonyms for "people". In System B, this hypothesis
may be maintained, the only difference being that in that system /e/ is a fully-fledged phoneme, established by the minimal pair -kena/kina ("flute", "variety of fruit"), which figures in the classificatory calculus.

For simplicity in the representation, I will adopt a convention similar to that adopted for /o/ and /u/-synonymy (above). For the moneme for "people", for example, I give "/xěnte/" where the umlaut over '/e/' indicates that a form with /i/ exists in addition to the form with /e/. In such forms, I use only the symbol /e/.

The existence of a weak form of vowel harmony may be noted in connection with both the Sets C discussed above.

The generalization of my intuitions on this point is that very often (but not exclusively) the 'closed' realisations (u, i) may not be followed in an adjacent phonetic syllable by the 'half-closed' realisations (o, e). We find:

\[
\begin{array}{llll}
\text{e/} & xěnte & \text{but not} & xǐnte^* \\
\text{xěnti} & \text{} & \text{} & \\
xǐnti & \\
\text{o/} & \text{trós} & \text{but not} & \text{trus}^* \\
\text{tróso} & \text{} & \text{} & \\
\text{trósu} & \\
\end{array}
\]

In two adjacent phonetic syllables, /e/ in the first does not vary to [i] unless /e/ in the second syllable also varies to [i]; similarly, /o/ in the first syllable does not vary to [u] unless /o/ in the second syllable also varies to [u]. This
generalization applies to a great number of cases:

**Yes**
- xénte, xénti, xínti
- mačéte, mačéti, mačíti
- tróso, trósu
- padése, padési
- soséde, sosédi
- méde, médi

**No**
- xínte*
- mačíte*
- trúso*
- padíse*
- sosíde*
- míde*

This is not intended as a hypothesis in the description proper, for it is ultimately reducible to an arbitrary statistical criterion. It offers little prospect of solving the phonological description of /o/, /u/, /e/ and /i/. At best, it is of some 'psychological' significance. On the whole, the combinations 'i-e' and 'u-o' in adjacent phonetic syllables of the type of Sets C (above) do not sound 'right' for the Quechua.
1. Preliminary.

For the theory behind this chapter, "Classificatory Calculus and Ordering Relations" (Sets, p115) is essential. I do not propose to repeat all that Mulder gives in that chapter of Sets, but reference will be made to that chapter, and the definitions of the classes which I establish, and of the relations which hold between them, will be given.

For the establishment of all paradigmatic classes in phonology, the distributional unit (e, n, i) is an essential point of reference in System A. The following definition should also be noted:

"Forms which are mutually substitutable in the same position and same context and are different are said... to commute with one another." (Sets, p24)

The minimum paradigmatic class in a language is one minimal pair e.g. paka/taka; sipi/tipi; sa'ua/ka'ua. Items which have distinctive function are 'paradigmemes' (Def. 5a). By virtue of commuting with another member of the same class, such elements in phonology may be established as phonemes. In this chapter, we consider 'phonemes' in their capacity as 'paradigmemes'. Remember also for 'paradigmeme':

'member of a semiotic set' (Def. 5)
What we are interested in doing is establishing that semiotic set or system which accounts for the data which we have. In this chapter, I shall establish several types of paradigmatic class in San Martín Quechua with reference to (e, n, i).

For the moment, we shall work with the provision that, if a member of a minimal pair shares formal characteristics with a mestizo Spanish form, then that minimal pair will not be used. For example, from the data we may identify a phoneme /b/ by way of a minimal pair such as -baka/paka ("cow", "hide"). The former member of the minimal pair shares formal characteristics with mestizo Spanish /baka/, meaning "cow". Such minimal pairs are not used in System A.

This system is not put forward as the only possible description of the data.

The paradigmatic classes which can be established are only one stage in arriving at a possible over-all description. I have chosen not to take the step of presenting my description of all the data (i.e. System B) in the first instance. The comparison of a system without 'Spanish' forms (System A) with a system with 'Spanish' forms (System B) is very revealing. The decision to leave out 'Spanish' forms at this stage, does not a priori rule them out of the description. In System B, they are treated in a complete sense by the classificatory calculus, but note that in System A the 'Spanish' forms are described. They are treated as marginal, and established
in an ad hoc way. I do not rule out the possibility that some linguists may hold System A in higher regard than System B.

2. Position Classes.

One of the most general paradigmatic classes which one can establish is a position class(pos), defined as:

'set of items which can occur in the same position or archiposition'\(^1\)

In this description, there are no archipositions, therefore we shall be dealing with items which occur in 'e', 'n' and 'i'. The classes are:

\[
\begin{align*}
pose & : p t k m n \tilde{h} l \tilde{z} \tilde{c} r s \tilde{s} i u \emptyset \\
pasn & : a i u \phantom{1}^2 \\
posi & : p t k \tilde{z} \tilde{c} r s \tilde{s} i u N \emptyset
\end{align*}
\]

The phoneme /l/ is omitted from posi because it occurs in 'i' only in 'Spanish' forms e.g. /tölda/ "mosquito-net".

The following classes are useful for reference. They are used later in the description for the statement of phonematic distribution. They are termed 'main distribution classes'. They are:

1. Both pose/posi : p t k \tilde{z} \tilde{c} r s \tilde{s} \emptyset

2. Only posn : a

---

\(^1\)Sets, p118.

\(^2\)'Zero' is not a member of posn, for a syllable with 'zero' nucleus could only be said to represent silence.
In order to calculate these classes, we use either a Venn Diagram or a Marquand Graph. For simplicity, I shall use a Venn Diagram. Only when we have to deal with four or more classes, or where we wish to compare a situation with three classes with another with a greater number of classes, need we use the Marquand Graph.

This yields the classes 'e', 'n' and 'i'; 'en', 'ni' and 'ei'; 'eni'. Of these classes, only 'e', 'n', 'i', 'ei' and 'eni' have members. The classes 'en' and 'ni' are empty.

An important notion for arriving at commutation classes (to be defined) is that of the strict paradigm (Spar), defined as:

'set of phonemes which commute in identical contexts'\(^1\)

These are too numerous in any language to enumerate, and in themselves are not sufficiently informative to merit attempted enumeration. Here are some Spars from San Martín Quechua:

1. \(\text{Spar}(e, a, \emptyset) : m n ñ p t u\)
   mama/nana/ñaña/papa/tata/ua'ua
2. \(\text{Spar}(e, a, N) : r ñ i u\)
   karaN/kažaN/ka'iaN/ka'uaN
3. \(\text{Spar}(Ø, u, i) : ū ñ r t ñ\)
   užku/učku/urku/utku/uNku
4. \(\text{Spar}(k, i, i) : a u\)
   kiru/karu/kuru

In working out the classificatory calculus, we look everywhere in the data for such Spars. They are a very important stepping-stone for further classes.

Note that the Spar is a set of phonemes which commute in identical contexts.

4. Phonematic Paradigms.

These classes are defined as:

\(^1\)Sets, p125.
a set of phonemes which commute in equivalent contexts¹

Note that here we refer to equivalent contexts in the definition of the 'phonematic paradigm' (par), as distinct from identical contexts in the 'strict paradigm' (Spar). The phonematic paradigm is related to the strict paradigm in that the phonematic paradigm is the sum of strict paradigms.² The paradigm on /-aO/ in San Martín Quechua is:

\[\text{p t k m n ñ ñ ĕ ř s ŕ i u ř} \]

This is equivalent to saying that the following sequences of phonemes are opposed in a functional way in the dialect: \(/\text{pa/}, /\text{ta/}, /\text{ka/}, /\text{ma/}, /\text{na/}, /\text{ña/}, /\text{ža/}, /\text{ća/}, /\text{ra/}, /\text{sa/}, /\text{ža/}, /\text{ia/}, /\text{ua/}, /\text{oa/}.\]

5. Commutation Classes.

The commutation class (com) is the sum of phonematic paradigms of which a phoneme is a member in all the positions in which it occurs. For instance, if we take the phoneme /i/, we establish the com of /i/ by adding together the following pairs in 'e', 'n' and 'i'. We need not repeat in any class a phoneme already counted in another class:

- 'e' : /i/ /p t k m n ñ ñ ĕ ř s ŕ /
- 'i' : /i/ /N ŏ /
- 'i' : /i/ /a u/
This gives the following com for /i/:

\[ \text{p t k m n ñ Ñ ċ r s ū u a N Ø} \]

For the proof that one can calculate the distinctive function of a phoneme in a class which is the sum of paradigms, see Sets, p128.

The coms in a possible San Martín Quechua phonological system can be represented in a diagram of the form used in Sets (p131). In this diagram, a square of the form:

\[
\begin{array}{ccc}
  & + & \\
  & | & \\
  & | & \\
  & | & \\
  & + & \\
\end{array}
\]

indicates that 'x' commutes with 'y' and that 'y' commutes with 'x'. By reading horizontally along a row of '+', we can ascertain the com of any phoneme in the left-hand column. The diagram in itself gives the coms of each phoneme, therefore these coms need not be listed individually. See the Diagram on the following page (p119), The Coms of System A.

6. Connective Opposition Classes.

These coms, and in particular the diagram given, enable us to establish another kind of class, which is defined as:
Diagram 1.

The Coms of System A.
These are connective opposition classes (Cops). Every member of a Cop commutes in equivalent contexts with every other member of the same Cop. With reference to the diagram on pl19, a Cop is a square of the form indicated above such that every possible commutation within the square is attested i.e. there are no blanks in the square, but every '+' is attested. The aim is to construct the fewest number of Cops which account for every commutation (marked '+' in Diagram 1). The diagram gives all the attested commutations between phonemes in equivalent contexts in System A.

The first Cop is easily established. I shall call it Cop A. It is /p t k m n ň ŋ ŋ ŋ s Ń i u 0/. Now, Cop B is /a i u/. Note that 'zero' does not figure, because the phoneme /a/, which can come only in 'n', is not opposed anywhere in the system to its absence. We can set up Cop C as /p t k ň ŋ ŋ ŋ s Ń i u N 0/. The Cop D is necessary only by virtue of the phoneme /l/, which occurs in only a very few forms, and is intuitively marginal. This Cop is /l k ŋ Ń/. The inclusion of Cop D leads to a different description of further classes, therefore I shall perform the description of functional equivalence classes (to be defined in 7) with and without /l/, in order to argue for the marginality of /l/ in a more satisfactory way.

On pl21, the Cops of System A are listed individually.

1 Sets, pl32.
The Cops, as Mulder says, provide the subsystems par excellence for the establishment of the distinctive features of phonemes. This is the case, because in the Cops every member of a class is opposed by commutation to every other member of that class. There is no risk of giving distinctive features on the basis of pseudo-commutation.

Subsystem A(Cop A):

<table>
<thead>
<tr>
<th></th>
<th>voiced occlusive</th>
<th>unvoiced occlusive</th>
<th>nasal</th>
<th>sibilant</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td>m</td>
<td></td>
<td></td>
<td>u</td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>n</td>
<td></td>
<td></td>
<td>s</td>
</tr>
<tr>
<td>palatal</td>
<td>ź</td>
<td>ĺ</td>
<td>ň</td>
<td>ŋ</td>
<td>i</td>
</tr>
</tbody>
</table>

[Unclassified: /k/, /r/]

Subsystem B(Cop B):

This tentative subsystem does not materialise for reasons explained on p32. The phonemes /a i u/ have the features 'a-ness', 'i-ness' and 'u-ness' respectively.

Subsystem C(Cop C):

<table>
<thead>
<tr>
<th></th>
<th>voiced occlusive</th>
<th>unvoiced occlusive</th>
<th>sibilant</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td></td>
<td>u</td>
<td></td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>s</td>
<td>i</td>
<td></td>
</tr>
<tr>
<td>palatal</td>
<td>ź</td>
<td>ĺ</td>
<td>ŋ</td>
<td>ŋ</td>
</tr>
</tbody>
</table>

[Unclassified: /k/, /r/]

1Sets, p137.
The over-all system is based on the subsystems derived from the Cops. The subsystem in which /l/ figures (Cop D) does not enable us to establish a subsystem on the basis of distinctive features, quite simply because it has too few members. In the over-all system, /l/ has only the feature 'l-ness'.

This is the over-all system:

<table>
<thead>
<tr>
<th></th>
<th>unvoiced occlusive</th>
<th>voiced occlusive</th>
<th>nasal</th>
<th>sibilant</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td>m</td>
<td>m</td>
<td>s</td>
<td>u</td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>i</td>
</tr>
<tr>
<td>palatal</td>
<td>ɾ</td>
<td>ŋ</td>
<td>ŋ</td>
<td>ŋ</td>
<td>i</td>
</tr>
</tbody>
</table>

[Unclassified: /k/, /r/, /l/]

It is interesting to note that the subsystem derived from Cop C adds nothing to the over-all system which is not already there in Cop A.

This system is 'unusual' in that /k/ is 'outside' the system. It cannot be included in the over-all classification, because it is not the product of an order and a series. In the absence of another 'dorsal' phoneme, /k/ cannot be shown to be 'occlusive'. It has only the feature 'k-ness'. By the same criteria as for /k/, /r/ is outside the system - there is no other 'vibrant, trill' phoneme to which /r/ might be opposed, by which it would be shown to be 'apical'. It has only the feature 'r-ness'. As stated above,
/l/ has only the feature '1-ness'.

Subsystem B may be given as the vowel system in System A, without change. This is /a i u/.

Note that the distinctive features of /u/ and /i/ in the consonantal and vocalic systems are not equivalent. This is not an inconsistency. It comes about because in those two systems, /u/ and /i/ commute with consonantal and vocalic phonemes respectively. It would indeed be strange if /u/ in the subsystem in the nuclear position were held to have consonantal distinctive features. In the nuclear position, /u/ (and /i/) commutes only with the vowel phoneme /a/.

The above is, I suggest, the 'Quechua' system par excellence. Only the element /l/ is intuitively marginal, the which can be recognised from its rarity of occurrence in the dialect. System A is close-knit and economical.

7. Functional Equivalence Classes.

These are defined as:

'sets of phonemes in equivalent coms' or

'sets of phonemes which belong to the same cops'\(^1\)

In the following set-theoretical representation, a represents Cop A, b represents Cop B, and c represents Cop C. I omit Cop D at this stage, therefore we can use a Venn Diagram for three classes:

\(^1\) Sets, p140.
The abbreviation used throughout for functional equivalence classes is \( \text{Feq} \). The \( \text{Feqs} \) are:

- \( \text{FeqP} \): \( a \quad -b \quad -c \quad : m \quad n \quad \tilde{n} \)
- \( \text{FeqQ} \): \( -a \quad b \quad -c \quad : a \)
- \( \text{FeqR} \): \( -a \quad -b \quad c \quad : N \)
- \( \text{FeqS} \): \( a \quad -b \quad c \quad : p \quad t \quad k \quad \tilde{z} \quad \tilde{c} \quad r \quad s \quad \tilde{s} \)
- \( \text{FeqT} \): \( a \quad b \quad c \quad : i \quad u \)

There are the following correspondences between \( \text{Feqs} \) and other classes:

- \( \text{FeqP} \) corresponds to the set which come only in 'e'.\(^{1/2} \)
- \( \text{FeqQ} \) only in 'n'.\(^{2} \)

\(^{1}\) This correspondence holds only if we treat /l/ as marginal. The similarity is nevertheless worthy of note.

\(^{2}\) 'Set' is an abbreviation for 'set of phonemes'. 
FeqR corresponds to the set which come only in 'i'.
FeqS " " " only in 'e' or 'i'.
FeqT " " " in 'e', 'n', 'i'.

The full significance of the system established here, and of the correspondences which hold within it, will become clear when we have explored some of the implications of not omitting 'Spanish' forms from the classificatory calculus.

If we include the phoneme /l/ in the calculus for functional equivalence classes, we must include Cop D. This Cop has the members /l k ĝ ĝ/. In calculating the Feqs, we require to take four classes into account. For four classes, I use a Marquand Graph. Mulder has constructed a Venn Diagram for four classes, but for the purpose of comparing Systems A and B a Marquand Graph is more informative visually.

Fig. 1.

<table>
<thead>
<tr>
<th>-a</th>
<th>b</th>
<th>ia</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-b</td>
<td>ptźrš</td>
<td>kčš</td>
</tr>
<tr>
<td>a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-a</td>
<td>b</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-b</td>
<td>N</td>
<td>l</td>
</tr>
</tbody>
</table>

\[ \begin{array}{ccc}
  \frac{d}{\neg c} & \frac{-d}{c} & \frac{d}{\neg c}
\end{array} \]
With a phoneme /l/, the \textit{Feqs} are:

\begin{align*}
\text{FeqA} & : a - b - c - d : m n \bar{n} \\
\text{FeqB} & : -a b - c - d : a \\
\text{FeqC} & : -a - b c - d : N \\
\text{FeqD} & : -a - b c d : l \\
\text{FeqE} & : a b c - d : i u \\
\text{FeqF} & : a - b - c d : k \bar{c} s \\
\text{FeqG} & : a - b c - d : p t \bar{z} r \bar{s}
\end{align*}

The inclusion of the phoneme /l/ not only results in the establishment of another \textit{Feq}, which has the member /l/, but leads also to the 'break-down' of the 'central' \textit{Feqs} \{p, t, k, \bar{z}, \bar{c}, r, s, \bar{s}\} into two \textit{Feqs}, \textit{FeqF} \{k, \bar{c}, \bar{s}\} and \textit{FeqG} \{p, t, \bar{z}, r, \bar{s}\}.

When I omitted the phoneme /l/, I was able to arrive at a system of a simple and balanced nature. There were no instances of a phoneme having a function very much different from others in the set.\footnote{Perfect symmetry is not to be expected of any system, of course, but conclusions such as these are very useful for the over-all description.} I believe that the 'centre' of the system is to be found in \textit{Cop A} and \textit{FeqS}. Distributionally, the phonemes in these classes are equivalent; in addition, they are equivalent in a paradigmatic sense. That is, they commute with each other and in equivalent positions.

When the phoneme /l/ is included, the fact that that phoneme commutes with only /k \bar{c} \bar{s}/ means that the paradigmatic functions of the phonemes /k \bar{c} \bar{s}/ are now different from the remainder of the phonemes in \textit{FeqS}(in the system without /l/). If I now give the \textit{Feqs}
of the system without a phoneme /l/, we can compare the Feqs of systems with and without a phoneme /l/:

a. without /l/:

<table>
<thead>
<tr>
<th>C</th>
<th>iu</th>
<th>ptkzőrsä</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>-C</td>
<td>mnn</td>
<td>a</td>
<td></td>
</tr>
</tbody>
</table>

b. with /l/:

| -a | b | \_
|-----|---|---
|     | iu |  
| -b   | ptkrš | kőš | mnn |
|     | a |
| -a | b | \_
| -b   | N | l |

This shows in a very simple way why I insisted (p55) on the fact that the inclusion of 'Spanish' forms does not merely consist of 'tagging' them on to the 'Quechua' forms.
The change in the system with /l/ from that without /l/ is quite evident. The following holds for 'marginal' elements in the system:—

The inclusion of a 'marginal' element leads to an increase in the number of Ffs (as compared with the set reached without the 'marginal' element), both by virtue of the inclusion of new Ffs which incorporate the 'marginal' element(s), and by virtue of the 'break-down' of the Ffs (without 'marginal' elements) into further classes.

This will become clearer when I go on to explore the implications of a phoneme /b/ in the system. In general, the introduction of 'marginal' elements, such as 'Spanish' forms are, leads to an unbalanced system. Quechua scholars, in the past, have not realised these consequences, most probably because their theories have not enabled them to formulate the consequences in the first place.

8. The Implications of /b/.

A phoneme /b/ could have figured in System A if we had chosen to describe those cases where [b] only occurs after a nasal (p92) as realisations of such a phoneme.

In order to demonstrate further the kind of consequences to be expected if we include 'marginal' elements, I have included here a short section on the implications of /b/. If we include /b/, we require five Cops in order to account for the possible commutations;
In order to calculate the Feqs, we now have to take into account five classes. The Marquand Graph is as follows:

```
<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
</tr>
<tr>
<td>-b</td>
<td>c</td>
<td>-c</td>
</tr>
<tr>
<td>-b</td>
<td>-c</td>
<td></td>
</tr>
<tr>
<td>-a</td>
<td>b</td>
<td>-c</td>
</tr>
<tr>
<td>-a</td>
<td>-c</td>
<td></td>
</tr>
</tbody>
</table>
```

In the system without /l/ and /b/, we had three Cops, seven possible
Feqs, of which five were realised. In the system with /l/, we had four Cops, fifteen possible Feqs, of which seven were realised. In the system with /l/ and /b/, we have five Cops, thirty-one possible Feqs, of which eleven are realised. These figures can be verified by counting the number of squares in each of the Marquand Graphs given. By subtracting one class, the empty class, one arrives at the possible number of classes (termed the 'power set'). By counting those classes which have phonemes in them, one arrives at the attested set, or, in other words, at the set of Feqs which is realised. One noticeable feature of the above procedure is that we have to consider larger and larger power sets, of which a decreasing number (proportionally to the power set) are realised.

In a system with /l/ and /b/, the Feqs are:

<table>
<thead>
<tr>
<th>Feq</th>
<th>Phoneme</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feq1</td>
<td>'a'</td>
<td>- b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feq2</td>
<td>'b'</td>
<td>- Z</td>
<td>- n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feq3</td>
<td>'c'</td>
<td></td>
<td>- a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feq4</td>
<td>'d'</td>
<td></td>
<td></td>
<td>- N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feq5</td>
<td>'e'</td>
<td></td>
<td></td>
<td></td>
<td>- l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feq6</td>
<td>'ab'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- m</td>
<td>- ā</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feq7</td>
<td>'bd'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- r</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feq8</td>
<td>'abd'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- p</td>
<td>- t</td>
<td>- s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feq9</td>
<td>'bde'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- ŭ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feq10</td>
<td>'abcd'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- i</td>
<td>- u</td>
<td></td>
</tr>
<tr>
<td>Feq11</td>
<td>'abde'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- k</td>
<td>- ē</td>
</tr>
</tbody>
</table>
**Fegs**, the 'centre' of System A, is represented here by five **Fegs**:

<table>
<thead>
<tr>
<th>Without /l b/</th>
<th>With /l b/</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>p</td>
</tr>
<tr>
<td>t</td>
<td>t</td>
</tr>
<tr>
<td>s</td>
<td>s</td>
</tr>
<tr>
<td>k</td>
<td>k</td>
</tr>
<tr>
<td>z</td>
<td>( \tilde{c} )</td>
</tr>
<tr>
<td>FegS</td>
<td>Feg8</td>
</tr>
<tr>
<td>FegS</td>
<td>Feg11</td>
</tr>
</tbody>
</table>

On p133, I compare the Marrquand graphs for the following three systems:

1. Without /l/ and /b/
2. With /l/
3. With /l/ and /b/

From this comparison, it can be fully appreciated that the introduction of /l/ and /b/ brings about significant descriptive consequences in the system. In the series of diagrams on p133, the members of **FegS** in System 1(above) are **ringed**. The **Fegs** in Systems 2 and 3(above) which are not found in System 1 are marked with an asterisk *.

---

1This kind of consequence was implied when I discussed the implications of /b d g f x/(Spanish forms) on p40-43.
<table>
<thead>
<tr>
<th></th>
<th>c</th>
<th>iu</th>
<th>ptkčžrřsš</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>-c</td>
<td>mnů</td>
<td>a</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>-b</td>
<td>b</td>
<td>-b</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2</th>
<th>a</th>
<th>b</th>
<th>iu</th>
<th>kčš</th>
<th>mnů</th>
</tr>
</thead>
<tbody>
<tr>
<td>-b</td>
<td></td>
<td></td>
<td>ptžre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-a</td>
<td></td>
<td></td>
<td></td>
<td>a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>1*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>-d</td>
<td>d</td>
<td>-d</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>d</th>
<th>c</th>
<th>iu</th>
<th>kč</th>
<th>mů</th>
<th>b*</th>
</tr>
</thead>
<tbody>
<tr>
<td>-b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-c</td>
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<tr>
<td>-a</td>
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<td>-d</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>-e</td>
<td>e</td>
<td>-e</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. Changes in the Over-all System.

The inclusion of /l/, as we noted on p123, brings about no significant change in the over-all system, for that phoneme can not be brought under any system in San Martín Quechua - it is outside the system, having only the feature 'l-ness'.

The inclusion of /b/, however, results in a change in the labial order in the over-all system. This comes about because of the membership of /b/ in a Cop(see p130), which is:

\[
\begin{array}{cccc}
  b & p & t & k \\
m & n & s & i \\
\end{array}
\]

This enables us to construct a subsystem with /b/, and distinctive features may be established for that phoneme. The subsystem is:

<table>
<thead>
<tr>
<th></th>
<th>voiced occlusive</th>
<th>unvoiced occlusive</th>
<th>nasal</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>b</td>
<td>p</td>
<td>m</td>
<td>u</td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>palatal</td>
<td>ċ</td>
<td></td>
<td>ñ</td>
<td>i</td>
</tr>
</tbody>
</table>

[Unclassified: /k/, /s/]

The over-all system with /b/:

<table>
<thead>
<tr>
<th></th>
<th>voiced occlusive</th>
<th>unvoiced occlusive</th>
<th>nasal</th>
<th>vocalic</th>
<th>sibilant</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>b</td>
<td>p</td>
<td>m</td>
<td>u</td>
<td>Ł</td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td></td>
<td>n</td>
<td></td>
<td>s</td>
</tr>
<tr>
<td>palatal</td>
<td>ź</td>
<td>ċ</td>
<td>ñ</td>
<td>i</td>
<td>ń</td>
</tr>
</tbody>
</table>
Unclassified in this over-all system are /k/, /r/ and /l/.

The full implications of a system which allows 'marginal' elements can be seen when System B is established in a later chapter.

The diachronic criterion of formal similarity to mestizo Spanish is not one hundred percent reliable, and I do not intend in the thesis that the reader believe that it is. Intuitively, /l/ is marginal, but it falls in a no-man's land between 'Quechua' and 'Spanish'. In 'e', it occurs in 'Quechua' forms; in 'i', it occurs in 'Spanish' forms. The best solution is to regard /l/ as a member of both Systems A and B. With /b/, I opt for regarding all instances of /b/ as part of System B. ¹

10. Ad Hoc Phonemes.

If we choose not to allow minimal pairs which have 'Spanish' members, the only solution open to us in describing /b d g f x e o/(which occurs mainly in 'Spanish' forms) is to treat these elements in an ad hoc way. If we do this, /b d g f x e o/, in System A, form part of the over-all statement put forward to account for the data, but cannot be held to form part of the over-all system established on the basis of distinctive features and commutation.

This is a possible description. In fact, it is a better one than may at first be appreciated. This is so because, if we explore

¹There is the unavoidable consequence, with this decision, that forms such as /maNñaiba/("big") and /bínča/("headband"), which are diachronically 'Quechua', must be treated in an ad hoc way.
some of the implications of including 'Spanish' minimal pairs, we find that the system is unbalanced. Some linguists might choose, on the basis of a comparison between my Systems A and B, to opt for System A, which does not allow 'Spanish' minimal pairs.

I have alluded to the intuitively 'marginal' character of the phoneme /l/. It occurs in only a very few 'Quechua' forms. By the diachronic criteria used to establish 'Spanish' forms i.e. formal similarity to mestizo Spanish, /l/ is a border-line case, because in 'e' it figures in 'Quechua' forms (but not in 'i' in those forms), while in 'i' it figures only in 'Spanish' forms. If we limit ourselves to stating that /l/ is a member of only in System A, it may be included. It is preferable to maintain /l/ in both System A and System B than to make an arbitrary decision in favour of one or other system. The phoneme /l/, therefore, is a member of System A (and of System B). This is important for succeeding chapters.
IX

THE PHONEMES OF SYSTEM A AND THEIR REALISATIONS

1. The phoneme /a/.

/a/ occurs in 'n' only, and is the only 'vowel' phoneme in this system. It is a member of CopC along with /i u/, and is the sole member of FeqB.

\[ /a/ \] /ka-žu/ "tongue" /ki-žu/ "yellow"

\[ /a/ \] /ki-ža/ "moon" /ki-žu/ "yellow"¹

1a. Realisations of /a/.

The realisation of /a/ depends on its phonetic context. It is realised [a] — back, open, rounded, lax — in the complex [āu], and before [m], [n], [ŋ], irrespective of whether these sounds are the realisations of the phonemes /m/, /n/, /k/ in 'e' or of the archiphoneme /r/ or /k/ in 'i': [kāupa], [kāusaŋ], [wāuki], [kaŋ], [kampa], and [pūrak]. It is realised [a] — back, half-open, rounded, lax — before any sound except those listed for [a] (above), or in the complex [ā]: [kāusa], [kaŋ], [iška], [pata], [taparāku], [nāti]. It is realised [a'] — back, open, rounded, lax, nasalized — before a nasal: [kāŋ], [nampa], [wāŋgana]. This last realisation occurs only rarely, and generally before a velar nasal realisation.

2. The phoneme /i/.

/i/ operates in all three positions 'e', 'n' and 'i'. It commutes

¹Throughout this chapter, '-' denotes 'syllabic boundary'.
with /p t k m n ŋ ž ŋ r s ū a ŋ ə/. The phonemes /i/ and /u/ are the only 'consonantal-vocalic' phonemes in this system, belonging to FEqE.

i/p /ka-ia/ "call" /ka-pa/ "shout"
i/t /ia-ka/ "almost" /ta-ka/ "sprain"
i/k /iu-ia/ "think" /ku-ia/ "love"
i/m /u-ia/ "face" /u-ma/ "head"
i/n /u-ia/ "face" /u-na/ "early morning"
i/ŋ /ia-ka/ "almost" /ŋa-ka/ "bewitch"
i/l
2a. Realisations of /i/.

/i/ is realised according to its context in (e, n, i). Like /u/ (described in 3 - below), it is best described in realisation in the

\[\text{---} \]

--- indicates that no minimal pair is attested.
peripheral positions in combination with the nuclear sound in the phonetic syllable. The following combinations are possible:

explosive..............[já]  
[ğu]

implosive..............[á̄1̄]  
[ú̄1̄]  
[î̄1̄]

1. Explosive: when [a] is nuclear, [j] is characterised as a movement from 'front, close, spread, lax' towards 'back, open, rounded, lax', merging with the phonetic nucleus [a]. The 'point' of articulation is roughly 'palatal', though contact with the palate is partial, which gives this sound its observable 'consonantal' quality. The articulatory starting-point for [j] is less spread than for [i] in the nuclear position - it may be described as 'lax'. When [u] is nuclear, [j] may be characterised as a movement from 'front, close, spread, lax' towards 'back, close, rounded, tense', where it merges with the phonetic nucleus [u].

2. Implosive: when [a] is nuclear, [i] may be characterised as a movement from 'back, open, rounded, lax' towards 'front, close, spread, lax' - this is almost the exact reverse of the description of [já](above). When [u] is nuclear, [i] is characterised as a movement from 'back, close, rounded, tense' towards 'front, close,
spread, lax' - this is almost exactly the reverse of the description of [jʊ] (above).

The combination [ii] is a good example by which to show the difference between 'vocalic' (nucleus of the phonetic syllable) and 'consonantal' (periphery of the phonetic syllable) realisations of the phoneme /i/. The realisation of /ii/ does not merely involve a lengthening of the nuclear realisation of /i/. There is a definite increase in closure and spreading which, if taken slightly further, would result in a palatal fricative rather similar to German ich. The point of articulation of [i] is in the region of the front palate - there is a very slight regression of the point of articulation from [i] \rightarrow [i] in the combination [ii].

The [j] and [i] realisations of the phoneme /i/ may be briefly referred to as 'glides'.

3. The phoneme /u/.

/u/ operates in all three positions in (e, n, i). It commutes with /p t k m n ŋ ź č r s ŝ i a N O/.

<table>
<thead>
<tr>
<th>u/p</th>
<th>/ka-ua/ &quot;see&quot;</th>
<th>/ka-pa/ &quot;shout&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>u/t</td>
<td>/ua-ta/ &quot;year&quot;</td>
<td>/ta-ta/ &quot;father&quot;</td>
</tr>
<tr>
<td>u/k</td>
<td>/pa-ua/ &quot;fly&quot;</td>
<td>/pa-ka/ &quot;hide&quot;</td>
</tr>
<tr>
<td>u/m</td>
<td>/ua-si/ &quot;house&quot;</td>
<td>/ma-si/ &quot;companion&quot;</td>
</tr>
<tr>
<td>u/n</td>
<td>/ua-ua/ &quot;baby&quot;</td>
<td>/na-na/ &quot;pain&quot;</td>
</tr>
<tr>
<td>u/ŋ</td>
<td>/ua-ka/ &quot;cry&quot;</td>
<td>/ŋa-ka/ &quot;bewitch&quot;</td>
</tr>
</tbody>
</table>
3a. Realisations of /u/.

In the nuclear position, /u/ is realised 'back, close, rounded, tense'.

In the peripheral positions, [w] and [u] must be taken along with the nucleus of a particular phonetic syllable. The possible combinations are:

explosive.........[wa]
[wi]
implosive.........[au]

The explosive realisation is a glide. It may be characterised as a movement from 'back, close, rounded, tense, labial' to a more 'open' and 'lax, rounded' position, at which point it merges with the phonetic nucleus [a]. If [w] is followed by [i], it may be
characterised as a movement from 'back, close; rounded, tense, labial' towards 'front, close, spread' - in this case, there is no 'opening' of the vowel at all. In the combination [au], the situation is almost exactly the reverse of that given for [wa] - [u] is begun in a somewhat more 'open' position than before [i], or in nuclear position in general; it is lax (this hangs over from [a] in the nucleus), and is a movement towards 'back, close, rounded, tense, labial'. The tenseness of this rounding of [u] is less than that of [w] in the initial position, as in [wa].

I can find no way of describing [w] or [u] in isolation. Daniel Jones¹ advocates specifically the need to deal with glides and semi-vowels in conjunction with the phonetic nucleus - the [w] realisations in [wa] and [wf] are not the same sound. This is because of the difference between the syllabic nuclei [a] and [i].

4. The Vowel System in System A.

For the purpose of giving a rough picture of the relations between /a i u/, a table as follows may be given:

<table>
<thead>
<tr>
<th></th>
<th>open</th>
<th>close</th>
</tr>
</thead>
<tbody>
<tr>
<td>rounded</td>
<td>a</td>
<td>u</td>
</tr>
<tr>
<td>spread</td>
<td>i</td>
<td></td>
</tr>
</tbody>
</table>

As pointed out on p32, however, in the strictest sense, this is not a subsystem - /a/ is outside the system, and in consequence /u/ and /i/ are outside the system. The phonemes /a i u/ have the features

¹The Phoneme: Its Nature and Use, p70-81.
'a-ness', 'u-ness' and 'i-ness' respectively. If a phoneme /e/ were in the system, then we could establish 'rounded' as a feature of /a/, and give the following vowel system:

<table>
<thead>
<tr>
<th></th>
<th>open</th>
<th>close</th>
</tr>
</thead>
<tbody>
<tr>
<td>rounded</td>
<td>a</td>
<td>u</td>
</tr>
<tr>
<td>spread</td>
<td>e</td>
<td>i</td>
</tr>
</tbody>
</table>

This hypothetical system is possible, because 'rounded' /a/ is opposed to 'spread' /e/.

5. The phoneme /p/.

/p/ operates in 'e' and 'i', and commutes with /t k m n ñ ñ r s ñ i u ñ 0/. The phoneme /p/ is one of the set of phonemes which can occupy both peripheral positions in a syllable-instance e.g. /pup/.

- p/t /pap/ "potato" /ta-ta/ "father"
- p/k /paua/ "fly" /ka-ua/ "see"
- p/m /pai/ "he, she" /mai/ "where?"
- p/n /pana/ "potato" /na-na/ "pain"
- p/ñ /pana/ "potato" /ña-ña/ "sister"
- p/l ------
- p/z /ka-pa/ "shout" /ka-ža/ "begin"
- p/ẓ /pái/ "he, she" /ẓái/ "that"

---

1 For discussion of a similar situation in Pekingese, see Sets, P138.
5a. Realisations of /p/.

After a nasal in the same accent group, /p/ has a free variant realisation [b] — voiced, bilabial, occlusive. The realisation [b], after nasal in the same accent group, is in free variance with [p] — unvoiced, bilabial, occlusive, which realisation also occurs in 'e' and 'i'. In the 'explosive' position, the realisation may be accompanied by a trace of aspiration [pʰ]; in the 'implosive' position, the realisation is mere 'occlusive'.

I describe a small set of instances where only [b] occurs after nasal as realisations of the phoneme /p/. These were listed on p92.

6. The phoneme /t/.

/t/ operates in 'e' and 'i', and commutes with /p k m n ŋ š r s ŋ i u N O/. The occurrence of the phoneme /t/ is limited in 'i', as far as I know, to the form /ṭ-ku/ "cotton".

t/p /ta-ta/ "father" /pa-pa/ "potato"
6a. Realisations of /t/.

/t/ has a free variant realisation [d], along with [t], after a nasal in the same accent group. The realisation [d] is voiced, apico-dental occlusive; [t] is unvoiced, apico-dental occlusive.

7. The phoneme /k/.

/k/ operates in 'e' and 'i', and commutes with /p t m n ń l ĺ Č r s ė i u N O/. It is a member of FegF. This phoneme is one of the set which may occupy both 'e' and 'i' in a syllable-
instance e.g. /kuk/.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Katakana</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>k/p</td>
<td>/kai/</td>
<td>&quot;this&quot;</td>
</tr>
<tr>
<td></td>
<td>/pai/</td>
<td>&quot;he, she&quot;</td>
</tr>
<tr>
<td>k/t</td>
<td>/kai-ka/</td>
<td>&quot;and this&quot;</td>
</tr>
<tr>
<td></td>
<td>/kai-ta/</td>
<td>&quot;this(O)&quot;</td>
</tr>
<tr>
<td>k/m</td>
<td>/ma-ka/</td>
<td>&quot;fight&quot;</td>
</tr>
<tr>
<td></td>
<td>/ma-ma/</td>
<td>&quot;mother&quot;</td>
</tr>
<tr>
<td>k/n</td>
<td>/ma-kaN/</td>
<td>&quot;fights&quot;</td>
</tr>
<tr>
<td></td>
<td>/ma-naN/</td>
<td>&quot;no&quot;</td>
</tr>
<tr>
<td>k/H</td>
<td>/kaN/</td>
<td>&quot;you&quot;</td>
</tr>
<tr>
<td></td>
<td>/naN/</td>
<td>&quot;path&quot;</td>
</tr>
<tr>
<td>k/l</td>
<td>/ka-ia/</td>
<td>&quot;call&quot;</td>
</tr>
<tr>
<td></td>
<td>/la-ia/</td>
<td>&quot;class&quot;</td>
</tr>
<tr>
<td>k/Z</td>
<td>/pa-ka/</td>
<td>&quot;hide&quot;</td>
</tr>
<tr>
<td></td>
<td>/pa-za/</td>
<td>&quot;pick(fruit)&quot;</td>
</tr>
<tr>
<td>k/Ł</td>
<td>/kaI/</td>
<td>&quot;this&quot;</td>
</tr>
<tr>
<td></td>
<td>/ćai/</td>
<td>&quot;that&quot;</td>
</tr>
<tr>
<td>k/r</td>
<td>/si-ki/</td>
<td>&quot;bottom&quot;</td>
</tr>
<tr>
<td></td>
<td>/si-ri/</td>
<td>&quot;rest&quot;</td>
</tr>
<tr>
<td>k/s</td>
<td>/ma-ki/</td>
<td>&quot;hand&quot;</td>
</tr>
<tr>
<td></td>
<td>/ma-si/</td>
<td>&quot;companion&quot;</td>
</tr>
<tr>
<td>k/Ś</td>
<td>/ku-ia/</td>
<td>&quot;love&quot;</td>
</tr>
<tr>
<td></td>
<td>/śu-ia/</td>
<td>&quot;wait&quot;</td>
</tr>
<tr>
<td>k/i</td>
<td>/ća-ka/</td>
<td>&quot;bridge&quot;</td>
</tr>
<tr>
<td></td>
<td>/ća-ia/</td>
<td>&quot;arrive&quot;</td>
</tr>
<tr>
<td>k/u</td>
<td>/pa-ka/</td>
<td>&quot;hide&quot;</td>
</tr>
<tr>
<td></td>
<td>/pa-ua/</td>
<td>&quot;fly&quot;</td>
</tr>
<tr>
<td>k/N</td>
<td>/kau-sak/</td>
<td>&quot;one who lives&quot;</td>
</tr>
<tr>
<td></td>
<td>/kau-saN/</td>
<td>&quot;lives&quot;</td>
</tr>
<tr>
<td>k/O</td>
<td>/ńuk-ńu/</td>
<td>&quot;sugar&quot;</td>
</tr>
<tr>
<td></td>
<td>/ńu-ńu/</td>
<td>&quot;breast&quot;</td>
</tr>
</tbody>
</table>

?a. Realisations of /k/.

After a nasal in the same accent group, /k/ has combinatory variant realisations [k] x [g]. The realisation [g] is voiced, velar occlusive; that of [k] is unvoiced, velar occlusive. Before [Z] in the same accent group, the combinatory variant realisation [g] occurs.

In 'i', /k/ may be realised unvoiced, velar, fricative [x]. The
realisations \([k]\) and \([x]\) are in free variance in this position.

8. The phoneme \(/m/\).

\(/m/\) operates in 'e' only, and commutes with \(/p\ t k n ñ ŋ ñ r s ñ i u o/\). It is a member of \(\text{FegA}\), which class corresponds to the class of phonemes which can come only in 'e'.

\[
\begin{array}{lll}
\text{m/p} & /\text{mai}/ \ "where?" & /\text{pai}/ \ "he, she"
\text{m/t} & /\text{ma-ma}/ \ "mother" & /\text{ta-ta}/ \ "father"
\text{m/k} & /\text{mai}/ \ "where?" & /\text{kai}/ \ "this"
\text{m/n} & /\text{ma-ma}/ \ "mother" & /\text{na-na}/ \ "pain"
\text{m/ñ} & /\text{ma-ma}/ \ "mother" & /\text{ña-ña}/ \ "sister"
\text{m/ž} & /\text{ma-ki}/ \ "hand" & /\text{ža-ki}/ \ "grief"
\text{m/č} & /\text{ma-ki}/ \ "hand" & /\text{ča-ki}/ \ "foot"
\text{m/r} & /\text{sa-ma}/ \ "rest" & /\text{sa-ra}/ \ "maize"
\text{m/s} & /\text{ma-ma}/ \ "mother" & /\text{sa-ma}/ \ "rest"
\text{m/š} & /\text{pái-mí}/ \ "he indeed" & /\text{pái-ši}/ \ "he, they say"
\text{m/ñ} & /\text{ma-ka}/ \ "fight" & /\text{ia-ka}/ \ "almost"
\text{m/u} & /\text{ma-ka}/ \ "fight" & /\text{ua-ka}/ \ "cry"
\text{m/N} & \text{precluded by distribution}
\text{m/ø} & /\text{ma-si}/ \ "companion" & /\text{a-si}/ \ "smile"
\end{array}
\]

The phoneme \(/m/\) is realised bilabial nasal \([m]\).

9. The phoneme \(/n/\).

\(/n/\) operates in 'e' only, and commutes with \(/p\ t k m ñ ŋ ñ r s ñ i u o/\)
The phoneme /n/ is realised apico-alveolar nasal [n].

10. The phoneme /ŋ/.

/ŋ/ operates in 'e' only, and commutes with /p t k m n ŋ/
10a. Realisation of /\ñ/.

The description 'palatal nasal' is not a sufficient description of the realisation of /\ñ/. I describe the realisation of this phoneme in 'explosive' position as palatal nasal plus semi-vowel [\ñ^j]. The description 'palatal nasal' is more appropriate for the realisation of the archiphoneme /N/ before /Z Ě Ė/, as in [man\ñáiba], [tijáñ\ñi] and [káñ\ñis]. The situation is similar to that in Castilian - if one can appreciate the difference between the nasal sounds in 'a-ñó' (syllable-initial - explosive), and 'añ-cho' (syllable-final - implosive), one can gain a good impression of the situation in Quechua. Palatal
nasals have different realisations in 'explosive' and 'implosive' position in the phonetic syllable. Phonetically, it would be rather difficult to pronounce the 'implosive' palatal nasal of [tijāñsi] in syllable-initial position, and to pronounce 'explosive' palatal nasal plus semi-vowel of [ńjāti] in syllable-final position. The distinction between these two realisations is blurred if we call them both 'palatal nasal'. I distinguish them by calling the 'explosive' realisation 'palatal nasal plus semi-vowel' - [j], of course, is an 'explosive' sound pat excellance.

11. The phoneme /l/.

/l/ may occur only in 'e' in 'Quechua' forms, and commutes with /k Ɛ Ƨ/. It occurs in only a very few forms in the language, and is in all ways a very puzzling feature. Although /l/ is intuitively marginal, I have included it in System A.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/p</td>
<td>--------</td>
</tr>
<tr>
<td>1/t</td>
<td>--------</td>
</tr>
<tr>
<td>1/k</td>
<td>/la-ia/ &quot;class&quot; /ka-ia/ &quot;call&quot;</td>
</tr>
<tr>
<td>1/m</td>
<td>--------</td>
</tr>
<tr>
<td>1/n</td>
<td>--------</td>
</tr>
<tr>
<td>1/ŋ</td>
<td>--------</td>
</tr>
<tr>
<td>1/ɔ</td>
<td>--------</td>
</tr>
<tr>
<td>1/ɔ</td>
<td>/la-ia/ &quot;class&quot; /ɔa-ia/ &quot;arrive&quot;</td>
</tr>
<tr>
<td>Sound</td>
<td>Example</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>/l/</td>
<td>/la-ia/</td>
</tr>
<tr>
<td></td>
<td>/ša-ia/</td>
</tr>
<tr>
<td>/r/</td>
<td></td>
</tr>
<tr>
<td>/s/</td>
<td></td>
</tr>
</tbody>
</table>

/1/ is realised apico-alveolar lateral [l].

12. The phoneme /ž/.

/ž/ operates in 'et' and 'i', and commutes with /p t k m n u/.

<table>
<thead>
<tr>
<th>Sound</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ž/</td>
<td>/žu-ka/</td>
<td>&quot;climb&quot;</td>
</tr>
<tr>
<td></td>
<td>/pu-ka/</td>
<td>&quot;red&quot;</td>
</tr>
<tr>
<td>/ž/</td>
<td>/pai-ža/</td>
<td>&quot;only he&quot;</td>
</tr>
<tr>
<td></td>
<td>/pai-ta/</td>
<td>&quot;him, her&quot;</td>
</tr>
<tr>
<td>/ž/</td>
<td>/pa-ža/</td>
<td>&quot;pick(fruit)&quot;</td>
</tr>
<tr>
<td></td>
<td>/pa-ka/</td>
<td>&quot;hide&quot;</td>
</tr>
<tr>
<td>/ž/</td>
<td>/ža-ki/</td>
<td>&quot;grief&quot;</td>
</tr>
<tr>
<td></td>
<td>/ma-ki/</td>
<td>&quot;hand&quot;</td>
</tr>
<tr>
<td>/ž/</td>
<td>/pai-ža/</td>
<td>&quot;only he&quot;</td>
</tr>
<tr>
<td></td>
<td>/pai-na/</td>
<td>&quot;now he&quot;</td>
</tr>
<tr>
<td>/ž/</td>
<td>/žu-ka/</td>
<td>&quot;climb&quot;</td>
</tr>
<tr>
<td></td>
<td>/ńu-ka/</td>
<td>&quot;I&quot;</td>
</tr>
<tr>
<td>/ž/</td>
<td>/ža-ki/</td>
<td>&quot;grief&quot;</td>
</tr>
<tr>
<td></td>
<td>/ža-ki/</td>
<td>&quot;foot&quot;</td>
</tr>
<tr>
<td>/ž/</td>
<td>/ki-žu/</td>
<td>&quot;yellow&quot;</td>
</tr>
<tr>
<td></td>
<td>/ki-ru/</td>
<td>&quot;tooth&quot;</td>
</tr>
<tr>
<td>/ž/</td>
<td>/ža-ki/</td>
<td>&quot;grief&quot;</td>
</tr>
<tr>
<td></td>
<td>/sa-ki/</td>
<td>&quot;leave behind&quot;</td>
</tr>
<tr>
<td>/ž/</td>
<td>/ka-žu/</td>
<td>&quot;tongue&quot;</td>
</tr>
<tr>
<td></td>
<td>/ka-źu/</td>
<td>&quot;variety of fruit&quot;</td>
</tr>
</tbody>
</table>
13. The phoneme /z/.

/z/ operates in 'e' and 'i', and commutes with /p t k m n h l z r s e i u N O/. It is a member of the 'central' face.

/z/ /za/ "begin" /ka-ia/ "call"
/z/ /za/ "begin" /ka-ua/ "see"
/z/ /uZ-ku/ "man" /uN-ku/ "illness"
/z/ /uZ-ku/ "man" /u-ku/ "the inside"

In 'e', /z/ is realised either [ʒ], palatal voiced 'hush', similar to French 'jour', or [ʧ], palatal lateral plus semi-vowel, similar to Castilian 'castillo'. In 'i', the 'hush' realisation described above occurs, or else we find a mere palatal lateral [I]. The difference between the palatal lateral plus semi-vowel [ʧ] and the palatal lateral [I] is similar to that between [ɲ] and [n] described in 10a., p149, [ʧ] is an 'explosive' realisation, and [I] an 'implosive' realisation. Of all the realisations of the phoneme /z/, the 'hush' [ʒ] is by far the most common.

As Torero(1964) correctly points out, a phoneme /z/ is a feature of mestizo Spanish in Lamas. We may add to his note that such a phoneme may be established also in the Spanish of Sisa. See my over-all system on p31.
13a. Realisation of /\c/.  
/\c/ is realised palatal affricate, unvoiced. This realisation, very similar to Castilian 'mucho' must be carefully distinguished from [\c], palatal voiced 'hush', and from [\s], palatal sibilant or 'hush'.

Martinet devotes a great deal of space in his published work to the problem of whether \( [t\phi] \) (a possible description of this realisation) is one phoneme or two. In System A, \( [t\phi] \) is a simultaneous bundle extending over only one position i.e. it is a

\[1\] For example, EGL, 3.23.
The phoneme /r/.

/r/ operates in 'e' and 'i', and commutes with /p t k m n h z c s i u N O/. It is one of the phonemes which can come in both peripheral positions in a syllable-instance e.g. /rur/.

- /r/p /pi-ra/ "who then?" /pi-pa/ "whose?"
- /r/t /pi-ra/ "who then?" /pi-ta/ "whom?"
- /r/k /si-ri/ "rest" /si-ki/ "bottom"
- /r/m /u-ra/ "below" /u-ma/ "head"
- /r/n /u-ra/ "below" /u-na/ "early morning"
- /r/N /pu-ru/ "absolutely" /pu-Nu/ "bed"
- /r/l -------
- /r/Ł /ki-ru/ "tooth" /ki-żu/ "yellow"
- /r/Č /sa-ra/ "maize" /sa-ća/ "woods"
- /r/s /ru-pai/ "burn" /su-pai/ "demon"
- /r/Ł /ka-ru/ "the distance" /ka-żu/ "variety of fruit"
- /r/i /ka-ra/ "feed(animal)" /ka-ia/ "call"
- /r/u /ka-ra/ "feed(animal)" /ka-ua/ "see"
- /r/N /ur-ku/ "hill" /uN-ku/ "illness"
- /r/O /ur-ku/ "hill" /u-ku/ "the inside"

/r/ is realised apico-alveolar trill. Note that the 'flap' [ɾ] of Castilian is not a feature of San Martín Quechua, nor is the retro-
flex [r] reported for several southern dialects of Quechua.  

15. The phoneme /s/.

/s/ operates in 'e' and 'i', and commutes with /p t k m n ñ ñr ñi u N 0/.

<table>
<thead>
<tr>
<th>/s/p</th>
<th>/ma-sa/</th>
<th>&quot;dry in sun&quot;</th>
<th>/ma-pa/</th>
<th>&quot;green liquid&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>/s/t</td>
<td>/si-pi/</td>
<td>&quot;put under water&quot;</td>
<td>/ti-pi/</td>
<td>&quot;cut&quot;</td>
</tr>
<tr>
<td>/s/k</td>
<td>/ma-sa/</td>
<td>&quot;dry in sun&quot;</td>
<td>/ma-ka/</td>
<td>&quot;fight&quot;</td>
</tr>
<tr>
<td>/s/m</td>
<td>/sa-ma/</td>
<td>&quot;rest&quot;</td>
<td>/ma-ma/</td>
<td>&quot;mother&quot;</td>
</tr>
<tr>
<td>/s/n</td>
<td>/niN-ci/</td>
<td>&quot;strong&quot;</td>
<td>/niN-ci/</td>
<td>&quot;we tell&quot;</td>
</tr>
<tr>
<td>/s/ñ</td>
<td>/ma-sa/</td>
<td>&quot;dry in sun&quot;</td>
<td>/ma-ña/</td>
<td>&quot;request&quot;</td>
</tr>
<tr>
<td>/s/l</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/s/ž</td>
<td>/sa-ki/</td>
<td>&quot;leave behind&quot;</td>
<td>/ža-ki/</td>
<td>&quot;sadness&quot;</td>
</tr>
<tr>
<td>/s/č</td>
<td>/sa-ki/</td>
<td>&quot;leave behind&quot;</td>
<td>/ča-ki/</td>
<td>&quot;dry&quot;</td>
</tr>
<tr>
<td>/s/r</td>
<td>/su-pai/</td>
<td>&quot;demon&quot;</td>
<td>/ru-pai/</td>
<td>&quot;burn&quot;</td>
</tr>
<tr>
<td>/s/š</td>
<td>/ma-su/</td>
<td>&quot;pestle-stick&quot;</td>
<td>/ma-šu/</td>
<td>&quot;bat&quot;</td>
</tr>
<tr>
<td>/s/i</td>
<td>/sa-ča/</td>
<td>&quot;woods&quot;</td>
<td>/ia-ča/</td>
<td>&quot;know&quot;</td>
</tr>
<tr>
<td>/s/u</td>
<td>/sa-si-ku/</td>
<td>&quot;diet&quot;</td>
<td>/ua-si-ku/</td>
<td>&quot;make house&quot;</td>
</tr>
<tr>
<td>/s/N</td>
<td>/kas-pi/</td>
<td>&quot;tree&quot;</td>
<td>/kaN-pi/</td>
<td>&quot;in you&quot;</td>
</tr>
<tr>
<td>/s/O</td>
<td>/sa-si-ku/</td>
<td>&quot;diet&quot;</td>
<td>/a-si-ku/</td>
<td>&quot;laugh&quot;</td>
</tr>
</tbody>
</table>

/s/ is realised apico-alveolar sibilant [s].

16. The phoneme /š/.

/š/ operates in 'e' and 'i', and commutes with /p t k m n

---

1See Lastra(1968), Parker(1965) and Solá/Yupanqui(1970).
It is one of the phonemes which can occupy both peripheral positions in a syllable-instance e.g. /ṣaṣ/.

/ṣ/p /ṣuN-ku/ "heart" /puN-ku/ "door"
/ṣ/t /ua-ṣa/ "behind" /ua-ta/ "year"
/ṣ/k /ṣu-ia/ "wait" /ku-ia/ "love"
/ṣ/m /pai-ṣi/ "he, they say" /pai-mi/ "he, indeed"
/ṣ/n /ṣi-na/ "like" /ni-na/ "flame"
/ṣ/h /ṣuk-ṣu/ "spindle" /nuk-ṭu/ "sugar"
/ṣ/l /ṣa-ia/ "stand" /la-ia/ "class"
/ṣ/ž /ka-ṣu/ "fruit type" /ka-ṭu/ "tongue"
/ṣ/č /ṣa-ia/ "stand" /ča-ia/ "arrive"
/ṣ/r /ka-ṣu/ "fruit type" /ka-ru/ "the distance"
/ṣ/s /ma-ṣu/ "bat" /ma-su/ "pestle-stick"
/ṣ/i /ma-ṣu/ "bat" /ma-iu/ "river"
/ṣ/u /ua-ṣa/ "behind" /ua-ua/ "baby"
/ṣ/N /kaṣ-na/ "this way" /kaN-na/ "now you"
/ṣ/O /ṣuN-ku/ "heart" /uN-ku/ "illness"

/ṣ/ is realised palatal 'hush', unvoiced. It is articulated at a point further back than English 'ship'.

17. The archiphoneme /N/.

/N/ operates at the end of accent groups, before any phoneme in the inventory, and commutes with /p t k z ċ r s ṣ i u o/.

1For the context of the archiphoneme /N/, see V.
17a. Realisations of /N/.

/N/ is realised according to its context, which is the phoneme which succeeds it in the accent group. I single out four realisations:

1. [m] : bilabial nasal - before a labial, as in [kάmpa], [tάmpa], [wάsímpí], [mάmpíš], [kúwánάmpa].

2. [n] : dental nasal - before an apical, which is not a trill [r], as in [íntí], [wasimánta], [kusánta].

3. [ŋ] : palatal nasal - before a palatal, as in [ínčík], [rínší]; this realisation is typically 'implosive' and lacks the 'explosive' element [j], unlike the realisation of /ñ/
in 'e'.

4. [ŋ] : velar nasal - before velars, as in [käŋga], [sůŋgu],
    [tataŋga], [ůŋgu], [sĩŋga].

The forms [m] and [ŋ] in [wäm b ra], [kĩmsa], [tãmja], [zãŋ ãwa] are
not realisations of the archiphoneme /N/ in System A, but the
realisations of ad hoc phonemes /m/ (for [m]) and /n/ (for [ŋ]).


The phoneme /u/ has a variant (free) realisation [gw] in only one
form in the data - [gwainá] is one realisation of /uaina/ "young man".
In System A, there is no alternative but to make a special description
of this form. It would be different if there were a phoneme /g/ in the
system. If /g/ were in the system, we could give "/guainá/" and
"/uainá/" as synonyms for "young man".


System A is, I suggest, the system par excellence for Quechua. I
say this because the Cops and Feqs based on the diachronically
'Quechua' minimal pairs display a close-knit quality not observable
in the comparable classes in System B.

Summarizing our statement of System A:

| Consonants       | : p t k m n ñ l ž ė r s ŝ |
| Vowels           | : a                        |
| Consonant-Vowels | : i u                      |
The phoneme /l/ is intuitively 'marginal'.

Ad Hoc Phonemes
: b d g f x e o
 m n (in a very few forms in 'i')

Complex Items
: pr, pl, pu, br, bl, fr, fu etc.

The notion of an 'ad hoc' phoneme may seem unsatisfactory to some readers. At this stage of the over-all description, it does seem unsatisfactory. In the course of the thesis, however, it will become clear that this description has many virtues. It is very difficult indeed to choose clearly in favour of either System A or System B.

1These forms provide the most severe problem for System A, as was explained in 111; in System A, they have to be treated in an ad hoc way. They are, nevertheless, included in the description, if not in the system.
1. Existing Statements of Quechua Phonology.

A great part of the modern linguistic description of the Quechua language has been performed by various satellites of the University of Cornell in Huaylas, Lima, Central Peru, Ayacucho (by members of the "Plan de Fomento Lingüístico") and in Bolivia. As a follower of functionalism, it would indeed be strange if I were to be in complete agreement with the methodologies used by this school of Quechua study - I have given a rough outline of my disagreement with the 'inductive' method in 1. In spite of my fundamental disagreement with that method, I would certainly not reject out of hand the Bloomfieldian contribution to Quechua linguistic description. Were it not for this contribution, it is fair to say that the literature on Quechua would be very scant indeed. Take this Bloomfieldian component out of the field, and one is left with a few (often out-of-date and unreliable) traditional grammars.

For the present day student of Quechua as an academic discipline, acquaintance with Bloomfieldian descriptions of Quechua is a major requirement if the great percentage of the literature is not to be

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1 See FOREWORD. Note that Solá and Parker, the major influences on this project, were disciples of C.F. Hockett.

2 Lastra (1968) is a revision of a PhD. thesis prepared under C.F. Hockett, at the University of Cornell.
inaccessible to him. In 1., I explained the disparity between the philosophical bases of Bloomfieldian linguistics and the present 'axiomatic' approach. In this chapter, I will consider briefly some aspects of Quechua phonological systems in order to bring out more clearly the different 'pictures' of Quechua phonology which one arrives at in 'American' and 'European' descriptions. This chapter is concerned, not so much with criticism of Bloomfieldian methodology (which requires a book on its own, if it is to be adequately performed), as with pointing out some of the more important differences between two kinds of description of Quechua phonology. In a short chapter, I cannot point out all the differences, but I hope to give some fairly clear indications which will be of help to the student who wishes to embark on the existing literature.

2. Some General Differences.

One major difference between Bloomfieldian descriptions and our own one provided the subject matter of IV - the 'syllable'. Bloomfieldian descriptions of Quechua use syllabic models of the form 'CVC', 'CV', 'CCVC', 'CV' and so on. A notable consequence of this approach is the establishment of /w/ and /y/ as phonemes separate from /u/ and /i/ (p. 65). This means that right away a Bloomfieldian description of Quechua will have two more phonemes in the system than a functionalist description. The Bloomfieldian
system will have /w y u i/ (4 phonemes), while the functionalist
description will have only /u i/ (2 phonemes). Every Bloomfieldian
description of Quechua of which I have knowledge describes /w/ and
/y/ as phonemes separate from /u/ and /i/ in the phonological system
of the dialect in question.

The functionalist notion 'distinctive feature' does not figure
in Bloomfieldian approaches. Given this, it is not a requirement for
Bloomfieldians to devise an over-all system in which every phoneme
is the product of an order and a series (which notions have no meaning
apart from the notion 'distinctive feature'). A Bloomfieldian over-all
system for consonants in San Martín Quechua would look like this:

Fig. 1.

<table>
<thead>
<tr>
<th></th>
<th>(bi-)labial</th>
<th>dental/ alveolar</th>
<th>palatal</th>
<th>velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>unvoiced occlusive</td>
<td>p</td>
<td>t</td>
<td>ċ</td>
<td>k</td>
</tr>
<tr>
<td>voiced occlusive</td>
<td>b</td>
<td>d</td>
<td></td>
<td>g</td>
</tr>
<tr>
<td>nasal</td>
<td>m</td>
<td>n</td>
<td>ŋ</td>
<td></td>
</tr>
<tr>
<td>fricative</td>
<td>f</td>
<td>s</td>
<td>š</td>
<td>x</td>
</tr>
<tr>
<td>lateral</td>
<td>l</td>
<td></td>
<td>ĵ</td>
<td></td>
</tr>
<tr>
<td>vibrant</td>
<td></td>
<td>r</td>
<td></td>
<td></td>
</tr>
<tr>
<td>semi-vowel</td>
<td>w</td>
<td></td>
<td></td>
<td>y</td>
</tr>
</tbody>
</table>

In such a system, no phonemes are left unclassified, for it is not
a requirement that every phoneme in the system be the product of an order and a series. In my description, /r/ does not figure in the over-all system, because there is no other 'vibrant' to which /r/ may be held to be opposed—this means that the tentative feature 'apical' cannot be ascribed to /r/. Similarly, /k/, in my description, is outside the over-all classification because, in the absence of any other tentative 'dorsal' phoneme, the feature 'occlusive' may not be ascribed to /k/. I classify /z/(usually given /ɨz/, like /-chief/ and /ɘz/, in Bloomfieldian descriptions), not in a 'lateral' set, but in the 'occlusive' series, thereby leaving /l/ outside the system; but this is a relatively minor difference.

Note that in the Bloomfieldian system, the phonemes /w/ and /y/ figure only in the system of consonants, while /u/ and /i/ figure only in the system of vowels. In my system, the phoneme /u/(which describes the data described by the Bloomfieldian /w/ plus /u/), and the phoneme /i/(which describes the data described by the Bloomfieldian /y/ plus /i/) figure in both the consonantal and vocalic systems.

A functionalist description regards the 'bi-' of 'bilabial' as irrelevant (i.e. as a redundant feature \(^1\)), given that (p, b) are not opposed to any 'occlusive' which is not 'bilabial'—in my system, I give only the feature 'labial'. Similarly, under our view, unless there is an opposition between 'dental' and 'alveolar', the feature

\(^1\) See p143.
'apical' is sufficient. Also, given that /k/ is not opposed to any other tentative 'dorsal' phoneme (e.g. to a 'uvular' /q/ as in Cuzco Quechua), the feature 'velar' is redundant - 'dorsal' is sufficient. These differences may be roughly ascribed to the European preference for (functional) 'distinctive features' as a point of reference for setting up an over-all system, as opposed to the Bloomfieldian preference for features of phonetic realisation.

Bloomfieldian descriptions of Quechua phonology form a virtually united front in incorporating ad hoc into their over-all systems the 'Spanish' forms /b d g f x e o/. This decision is much easier for the 'American' linguist than for his European counterpart, given that the latter, far from merely adding /b d g f x/, for example, to the 'Quechua' set of consonantal phonemes, must consider the functional implications of those phonemes as far as the whole system is concerned. One of the implications (in a functional sense) of the inclusion of /b d g/ as phonemes in all dialects of Quechua of which I have knowledge is the requirement that one establish a 'weak' neutralisation in 'i', where the archiphonemes /B D G/ figure. The following subsystem (or one similar to it), in most dialects, will hold only in the explosive position:

<table>
<thead>
<tr>
<th></th>
<th>unvoiced occlusive</th>
<th>voiced occlusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>b</td>
<td>p</td>
</tr>
<tr>
<td>apical</td>
<td>d</td>
<td>t</td>
</tr>
<tr>
<td>dorsal</td>
<td>g</td>
<td>k</td>
</tr>
</tbody>
</table>
[This is stated on the assumption that each of /p t k b d g/ can be shown to be the product of a series and an order.] In the 'implosive' position, in most dialects of Quechua, only [p, t, k] occur. We cannot usually give phonemes /p t k/ in that position, because 'unvoiced'(in the absence of an opposition to 'voiced') cannot be a feature of the tentative 'occlusive' phonemes /p t k/.

The system in 1 is one of mere 'occlusive' phonemes(excepting /z/ and /ʒ/, which are functionally opposed) - the archiphonemes /β ð γ/. This kind of consequence does not arise for those who include /b d g/ in the system ad hoc. The non-occurrence of [b, d, g] in syllable-final position(Bloomfieldian term), would probably be dealt with under the distribution of phonemes.1

Two more very important differences between my system and a Bloomfieldian one come with the treatment of that small set of forms where only [b] follows nasal(which is always [m]), and in those forms where [g] follows nasal(which is always [l]). In the absence of a functional opposition between [b] and [p] after nasals, I treat the realisation [b](above) as of the phoneme /p/, and list the forms which have only [b] as marginal. A Bloomfieldian description would almost certainly give a phoneme /b/ here.2

1 I say 'probably' because I have not come across any such statement. Bloomfieldians do not appear to have taken account of the fact that the 'Spanish' forms [b, d, g] may come only at the beginning of syllables in Quechua.

2 This would be the case even in the absence of a 'Spanish' phoneme /b/.
[ŋ] after nasal, which I treat as a combinatory variant of the phoneme /k/, would be given as a phoneme /g/. Thus, if we were to omit from the Bloomfieldian system the 'Spanish' forms, we would have:

<table>
<thead>
<tr>
<th>(bi-)labial</th>
<th>dental/</th>
<th>palatal</th>
<th>velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>unvoiced occlusive</td>
<td>p</td>
<td>t</td>
<td>ɾ</td>
</tr>
<tr>
<td>voiced occlusive</td>
<td>b</td>
<td>t</td>
<td>ɾ</td>
</tr>
<tr>
<td>nasal</td>
<td>m</td>
<td>n</td>
<td>ɾ</td>
</tr>
<tr>
<td>fricative</td>
<td>s</td>
<td>ɾ</td>
<td></td>
</tr>
<tr>
<td>lateral</td>
<td>l</td>
<td>ɾ</td>
<td></td>
</tr>
<tr>
<td>vibrant</td>
<td>r</td>
<td>ɾ</td>
<td></td>
</tr>
<tr>
<td>semi-vowel</td>
<td>w</td>
<td>ɾ</td>
<td>y</td>
</tr>
</tbody>
</table>

The consonantal system in System A is quite different:

<table>
<thead>
<tr>
<th></th>
<th>unvoiced occlusive</th>
<th>voiced occlusive</th>
<th>nasal</th>
<th>sibilant</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td>m</td>
<td>u</td>
<td></td>
<td></td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>n</td>
<td>s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>palatal</td>
<td>ɾ</td>
<td>ɾ</td>
<td>ɾ</td>
<td>ɾ</td>
<td>i</td>
</tr>
</tbody>
</table>

[Unclassified: /k/, /ɾ/, /l/]

Note that, in the absence of the 'Spanish' /x/, the phoneme /k/ is outside the system.
In San Martín Quechua, excluding 'Spanish' forms, Bloomfieldians would establish 16 consonantal phonemes, while functionalists (of the axiomatic school) will establish only 15 (including /N/). Including the "Quechua" vowels, Bloomfieldians will give 19 phonemes, while a functionalist will give 16 phonemes. Incorporating all items, a Bloomfieldian description will give 24 phonemes, while a functionalist one will give 21 phonemes. As a rule of thumb, Bloomfieldian descriptions yield a greater number of phonemes for a given language than do functionalist ones.

These important, but nevertheless very low-level differences (in that they are part of particular descriptions, and not theories) are the result of higher level differences between the two methods under discussion here. It would be wrong to suggest that the differences between these theoretical viewpoints can be fully explained with reference to sporadic descriptive statements as above. Even if a Bloomfieldian description and a functionalist one were to arrive at similar inventories (numerically and formally), they could never be said to arrive at the same inventories. While the two descriptions remain similar (numerically and formally), the elements in the two inventories do not have the same significance, for they are elements in different systems. The phoneme /p/, in my system, is a bundle (simultaneous) of the features 'labial' and 'occlusive', while /p/, in a Bloomfieldian system is 'an element which stands in contrast to the others in the phonological system' of San Martín Quechua, or

The qualification is necessary. Martinet would establish /w/ and /y/ as phonemes separate from /u/ and /i/.
part of a 'network of interlocking differences of sound' peculiar to San Martín Quechua. Thus our description of /p/ in San Martín Quechua, even though formally similar to a Bloomfieldian phoneme /p/ in the same language, could never be said to be the same description of the phoneme /p/. This is a result of different theoretical points of view which, in turn, rest on different philosophical principles.

It should be understood, therefore, that the present chapter can only give indications of differences between Bloomfieldian and functionalist Quechua phonological systems. In order to appreciate fully the differences (or to explain them in a thesis), one should have to make two descriptions of Quechua phonology, one in an axiomatic functionalist way, and another according to, say, Hockett. This is a fruitful exercise, but cannot be undertaken in toto here, for practical reasons.

3. A Series of Neutralisations in Cuzco Quechua.

One of the most notable characteristics of 'functionalism' is the notion 'redundant feature'. In Cuzco Quechua, there is a three-fold division of unvoiced occlusives (phonetically speaking) into what we may call 'simple occlusives', 'glottalized occlusives' and 'aspirated occlusives'.

---

1 The definitions are from Hockett, Course, Ch. 2.
3 I deal with the subsystem cited here from Cuzco Quechua in a manner analogous to my System A; that is, 'Spanish' forms are excluded.
The 'simple' occlusives (phonologically) are /p t č k q/; the 'aspirate' occlusives are /ph th čh kh qh/; the 'glottal' occlusives are /p' t' č' k' q'/. The phonetic features cannot be transported ipso facto, however, to the level of distinctive features in phonology, because the feature 'occlusive', as far as 'glottal' and 'aspirate' phonemes are concerned, is redundant. In the phonological system, the three series can be characterised as opposed to one another by the features 'occlusive' (/p t č k q/) \(\cup\) 'aspirate' (/ph th č k q/) \(\cup\) 'glottal' (/p' t' č' k' q'/). This is because there are no 'glottals' which are not 'occlusive', nor are there any 'aspirates' which are not 'occlusive'.

In Cuzco Quechua, there is the following subsystem in 'e':-

<table>
<thead>
<tr>
<th></th>
<th>occlusive</th>
<th>glottal</th>
<th>aspirate</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td>p'</td>
<td>ph</td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>t'</td>
<td>th</td>
</tr>
<tr>
<td>palatal</td>
<td>č</td>
<td>č'</td>
<td>čh</td>
</tr>
<tr>
<td>velar</td>
<td>k</td>
<td>k'</td>
<td>kh</td>
</tr>
<tr>
<td>uvular</td>
<td>q</td>
<td>q'</td>
<td>qh</td>
</tr>
</tbody>
</table>

Note that here the feature 'velar' is not redundant, unlike in San Martín Quechua, because 'velar' is not unique in the 'dorsal' orders.

In this dialect, there is a neutralisation of the phonemes of the 'occlusive', 'glottal' and 'aspirate' series, of all orders,
In implosive position. In that position, 'glottals' and 'aspirates' do not figure. If we take the 'labial' order /p p' ph/, we can show how this neutralisation is conceived. The classes of distinctive features are as follows:

\[
\begin{align*}
/p/ & \quad - \{\text{labial, occlusive}\} \\
/p'/ & \quad - \{\text{labial, glottal}\} \\
/ph/ & \quad - \{\text{labial, aspirate}\}
\end{align*}
\]

In 'e', /p/, /p'/ and /ph/ are opposed to one another by the features 'occlusive' $\lor$ 'glottal' $\lor$ 'aspirate'. The situation, set-theoretically is as follows:

As in the case of /m n ñ/ in San Martín Quechua (p73), the inter-
section is indicated, but bracketed, because the sets are disjoint.

Set-theoretically, in 'i', the situation is as follows:

Fig. 11.

Here, the oppositions between 'occlusive' \(\setminus\) 'glottal' \(\setminus\) 'aspirate' are suspended. We cannot give \(/p\)'/(tentative 'glottal') for example, because there is no way of showing that 'glottal' is a feature of the tentative \(/p\)' in the absence of an opposition to say \(/ph\), 'aspirate'. The phonological form in 'i' has only the feature 'labial'.

The diagrams on pages 172 and 173 show the situations in the other orders for 'occlusives'. Archiphonemes can also be generated
Apical

Apical

Palatal

Palatal
for neutralisations between 'occlusive', 'glottal' and 'aspirate'
phonemes of the 'apical', 'palatal', 'velar' and 'uvular' orders,
which archiphonemes are represented as /P T Č K Q/. The archi-
phonemes /P T Č K Q/, which form part of the subsystem in the
implosive position, when projected into the over-all system, are
each represented there by three phonemes:

<table>
<thead>
<tr>
<th>subsystem in 'i'</th>
<th>over-all system</th>
</tr>
</thead>
<tbody>
<tr>
<td>/P/</td>
<td>/p p' ph/</td>
</tr>
<tr>
<td>/T/</td>
<td>/t t' th/</td>
</tr>
<tr>
<td>/Č/</td>
<td>/č č' čh/</td>
</tr>
<tr>
<td>/K/</td>
<td>/k k' kh/</td>
</tr>
<tr>
<td>/Q/</td>
<td>/q q' qh/</td>
</tr>
</tbody>
</table>

This is termed a 'weak' neutralisation, since it derives from mere
'position', and not from any 'phonetic harmony'. I can find no good
reason for giving the context of this neutralisation as other than
'implosive' position.

A good initial hypothesis for the over-all system of Cuzco Quechua
consonants would have the phonemes /p p' ph t t' th č č' čh
k k' kh q q' qh m n ŋ l r s ʃ h i u/ (20 phonemes)
classified as on pl75, Fig.111. The vowel system in Cuzco Quechua
involves a complex problem with 'o/u', 'e/i', therefore I can make
no description, for the data available is insufficient. ¹

¹ The reader will have become aware of the fact that a great amount
of data is required to solve certain problems in a functionalist
description. This amount is rarely provided in existing literature.
Some authorities cite a 'retroflex fricative' phoneme /ɾ/ for certain varieties of Cuzco Quechua. If this is to be included in the overall system, we should have to have a scheme as follows:

### Table: Phonemes

<table>
<thead>
<tr>
<th></th>
<th>fricative</th>
<th>sibilant</th>
</tr>
</thead>
<tbody>
<tr>
<td>apical</td>
<td></td>
<td>s</td>
</tr>
<tr>
<td>palatal</td>
<td>/ɾ/</td>
<td>/s/</td>
</tr>
<tr>
<td>velar</td>
<td></td>
<td>h</td>
</tr>
</tbody>
</table>

I include this in a very tentative way. I would prefer to have first-hand access to data which includes a sound such as [ɾ], before passing judgement. Diachronically speaking, it is possible that [ɾ] has been borrowed from Spanish, for in no dialect which I have studied via

---

1 cf. Solá/Yupanqui(1970); /ɾ/ phonemes have been reported also by Lastra (1968), and Parker(1965), among others.

2 The authorities cited are very imprecise as to where their dialect is spoken.
literature) has /r/ been shown to function freely in the system. Unfortunately, Bloomfieldian scholars who have cited this interesting element have treated it in a very summary way. On the basis of the data of Sola/Yupanqui (1970), I doubt whether [ɾ] has phonemic status in Cuzco Quechua - this will have to be tested as a working hypothesis.

4. Napo Quechua (Ecuador).

The three-fold division (phonetic) of 'occlusives' into 'simple', 'aspirate' and 'glottal' does not occur in dialects north of roughly Andahuaylas (Southern Peru). From Ayacucho northwards, we find only a set of simple occlusives. To a greater or lesser degree, the northern dialects of Quechua approximate formally to San Martín Quechua in the matter of 'occlusives', but no dialect more so than that of Eastern Ecuador, referred to generally as Napo Quechua.¹

The over-all system for consonants in this dialect is:

<table>
<thead>
<tr>
<th></th>
<th>unvoiced occlusive</th>
<th>voiced occlusive</th>
<th>sibilant</th>
<th>nasal</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td></td>
<td>p</td>
<td>m</td>
<td>u</td>
<td></td>
</tr>
<tr>
<td>apical</td>
<td></td>
<td>t</td>
<td>s</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>palatal</td>
<td>ñ</td>
<td>ñ</td>
<td>ñ</td>
<td>ñ</td>
<td>i</td>
</tr>
</tbody>
</table>

[Unclassified: /k/, /ɾ/, /l/]

¹cf. Mugica (1967); also consult Mapili for the location of Napo. The cited work is a modest traditional grammar, but is very clear and useful on phonetic matters.
As in San Martín Quechua, /k/ lies outside the overall system. The above consonantal overall system may be compared with the San Martín Quechua system (p123).

In this dialect, [b] after nasal in the same accent group is in **combinatory variance** with [p] as a realisation of the phoneme /p/ e.g.

/pani/   [pany]  "sister"
/kâmpa/  [kamba]  "of you".

In their respective contexts in Napo Quechua, [p] and [b] are mutually exclusive. The situation parallels exactly that for [k] and [g] after nasal in the same accent group in San Martín Quechua. In Napo Quechua, [d] after nasal in the same accent group is a combinatory variant realisation of the phoneme /t/:-

/taNta/  [tanda]  "bread"

The realisations [t] and [d], in their respective contexts, are mutually exclusive. The situation for [k] and [g] parallels that for 'p/b' and 't/d' (above). They are combinatory variant realisations of the phoneme /k/:-

/kaNka/  [kanga]  "and you"

Similar combinatory variant realisations of the phonemes /p t k/ are reported in the Quechua of Quito¹, and in that of Cuenca (South Ecuador)².

The existence of such variants in Quechua dialects is attested only in San Martín (excepting Lamas, which only has the variant [g]), Cajamarca and in the Ecuadorean dialects cited. It is a feature par excellence of the most northern of the Quechua dialects. From roughly the zone of Huánuco and Huaylas\(^1\) to the south, nothing similar has been attested.\(^2\)

5. A Morphophonological Element in the Dialect of San Martín.

Strictly speaking, 'morphophonology' belongs to that section of the description which deals with grammar, but a significant part of the conclusions of morphophonology derive from phonological considerations, therefore an important morphophonemic 'rule' in the dialect (the only such 'rule') may be dealt with here.

The form of the moneme for "blood" in Quechua is /ia'uar/. The form of the moneme for "3rd person" is /N/. If we wish to combine the two elements to produce a sign for "his blood", the form of that sign is not /ia'uarN/*, but /ia'uarniN/. The purely formal element (in that it has no distinctive function in grammar) /ni/ is introduced.

I shall endeavour to formulate an explanation for this feature which is more rigorous and general than the traditional one, which

\(^1\)See Maplll.

\(^2\)This point (along with several others not discussed here) casts doubt on the historical hypothesis of Weiss (1949), who claims that the Quechuas of San Martín have their origins in south Peru, around the zone of Ayacucho-Andahuaylas.
takes roughly the following form: when a form beginning in a consonant combines with a form ending in a consonant, the element /ni/ is introduced. I shall attempt to explain this speech fact without direct reference to the notion 'consonant', for that explanation leads one into a certain amount of difficulty (unless one has a definition of 'consonant' like ours\(^1\)), when one comes across a form such as:

\[
\text{kawsayniyki} \quad \text{(orthographical form)}
\]

I shall explain the phonological factor in the morphophonemic 'rule' with reference to the distributional unit/syllable (e, n, i).

If we consider the form of the succeeding moneme in such cases, we find that in its form is always a phoneme in the **implosive** position. In the form of the moneme for "3rd person", /N/ is in the implosive position in any phonological form, no matter in which combination the moneme for "3rd person" occurs. The phoneme /r/ of "/ia'uar/" is also in the implosive position, no matter where the sign for "blood" occurs. If we wish to combine "blood" + "3rd person", we find that the phonological forms of the two monemes are **incompatible**. If we concentrate only on the latter syllable /uar/ of /ia'uar/, we have:

\[
\begin{array}{c|c|c}
\text{1} & \text{2} \\
\hline
\text{e} & \text{n} & \text{i} & \text{e} & \text{n} & \text{i} \\
\text{u} & \text{a} & \text{r} & - & - & \text{N}
\end{array}
\]

The **nuclear position of syllable 2 is empty**. Given that we cannot

\(^1\)See p68.
have a syllable without a nuclear phoneme (this could only be silence), the element /ni/ provides a complement to /N/ in the syllable 2:

\[
\begin{array}{cccc}
1 & & 2 \\
\hline \\
ed & n & i & e \\
u & a & r & n_i \\
\end{array}
\]

I call /ni/ a complementary formal element.

The explanation is not disrupted in any way by the occurrence in the implosive position of either syllable of the phonemes /i/ and /u/ - the principle remains the same. Anyway, in our scheme, /i/ and /u/ have been described as 'consonantal-vocalic'. What is really crucial, nevertheless, is not the 'consonant-ness' nor the 'vowel-ness' of an element before or after /ni/, but the fact that the element comes in the implosive position.

This phenomenon cannot be described in phonological terms alone, for clearly /ni/ is no different from any other syllable of the form 'CV' in the inventory of Quechua syllables. The situation which we are describing here only comes about when certain phonological forms of signs (grammatical consideration) are in combination. We cannot describe /ni/ without some reference to grammar. It is a morphophonemic feature.

No such phenomenon occurs when we combine "/tata/" + "/N/", "/tata/" + "/pa/". They are as follows in combination:
Here, there are no relevant syllables where the nucleus is empty.

A similar view may be taken of the variant forms of the moneme "of" in Cuzco Quechua\(^1\), /q/ and /pa/, although the intuitive phonological reasons for the variance do not seem to be as strong as for San Martín Quechua /ni/. The form /q/, no matter in what combination the grammatical element in question figures, is always in the implosive position - it provides a complement to the forms of monemes which have the implosive position empty e.g.

\[
\text{ñoga} + q
\]

"of me"

The form /q/ cannot be used as a complement to the forms of monemes which have the implosive position filled e.g.

\[
\text{ia'uar} + q^*
\]

Instead, when the implosive position is filled, /pa/ is used, giving:

\[
\text{ia'uar} + pa
\]

"of the blood"

We may note also that the complementary formal element /ni/ also occurs in Cuzco Quechua.\(^2\)

It should be noted that a lot of what goes under the name of

\(^1\) Solá/Yupanqui (1970).
\(^2\) ibid.
'morphophonemics' in 'American' descriptions of Quechua is handled in the present description on the level of phonology proper.

Parker\(^1\) treats \([m]\) before \([p]\) in Ayacucho Quechua as an 'automatic morphophonemic alternant':

"/m/ reemplaza a /n/ antes de /p/: /ñan/ 'camino', /ñampa/ 'del camino'." (p17)
"/m/ replaces /n/ before /p/: /ñan/ 'path, road', /ñampa/ 'of the path, road'." (My translation)

In our system, this would be treated purely on the phonological level, most likely as a factor in a neutralisation. The situation for nasals at the end of an accent group, as reported by Parker, appears to bear a close resemblance to that described for San Martín Quechua in \(V\). In my system, there would be only one form /ñaN/ for "path, road".

The treatment of \([o]\) and \([e]\) in conjunction with the 'uvular' \(/q/\) as a morphophonemic alternation\(^3\) is not possible in our view. The realizations \([o]\) and \([u]\) are combinatory variants of the phoneme \(/u/\) in 'n', the former coming in contact with the 'uvular' \(/q/\); \([e]\) and \([i]\) are combinatory variants of the phoneme \(/i/\), the former coming in contact with the 'uvular' \(/q/\). Some additional problems would

\(^1\) Parker(1965).

\(^2\) The term is Hockett's (see Course, p279). Hockett would call /n/ in /ñan/ the base form..."One of the alternate shapes is the base form, and the other or others are said to replace the base form under specific conditions..."(p279). /m/, therefore, replaces /n/, under the specific condition of a subsequent phoneme /p/.

\(^3\) Parker(1965).
have to be solved in connection with [o] and [e] in Spanish loans. The situation for [o] and [e] in contact with 'uvulars' is very similar in Cuzco Quechua, and a combinatory variance hypothesis may be confronted with the data in that dialect also.¹

We may note very briefly Parker's decision to treat 'variant' forms of monemes as morphophonemic alternants e.g. /tapsi/ or /taspi/.² We would almost certainly treat "/tapsi/" and "/taspi/" as synonyms for "shake".

6. Prosodic Features.

As Mulder has pointed out³:

"In most phonological descriptions great importance is attached to 'phonematics' i.e. the establishment of the phonemes, their properties, and their interrelations. 'Prosody' is usually dealt with in a much less elaborate way. The reason for this is not only that prosodic features are captured with much greater difficulty in models in which simple elements are of a discrete nature rather than of a continuous or gradient nature. It is also because there are reasons for regarding the phonemes as the basic material in phonology. Though certain prosodic features i.e. tones, are functionally on a level with phonemes, they are with regard to their occurrence wholly dependent upon phonemes or sequences of phonemes. We can therefore call these features para-phonematic features. The term by which they are usually denoted is 'prosodic features'."

² Parker(1965)
³ Sets, p209.
There are no 'tones' in San Martín Quechua. Here, I shall deal (very briefly) with stress and intonation. Mulder follows Martinet in regarding these features as outside the 'double articulation' of language. They must be treated in an ad hoc way. We may say that in the absence of a rigorous theory by which the continuous and gradient character of intonation, or the function of stress, may be exhaustively described, we need not dwell over long on the description of these features. We can give only an intuitive 'picture' of these features, and it is questionable if this kind of statement can be tested.

In the great majority of forms in San Martín Quechua, the stress is on the penultimate syllable of the phonological word. As Martinet has pointed out, the sole function of stress is not to be 'distinctive', but contrastive. Stress sets off one syllable against another, one word against another in the chain. Within certain limits, stress is an intuitive guide to the field-worker in isolating the phonological words in his 'text'.

Here are some examples where the stress is on the penultimate syllable of the phonological word:

wasípi "in the house"
kämpa "of you"
tatámba "of his father"

---

1EGL, 1.15.
2Sets, p55.
3EGL, 3.1.
The most prominent secondary stress tends to coincide with the form of the lexical moneme of a word (called 'semanteme' by Mulder\textsuperscript{1}):

\textit{wawainikunawàngə} "and with my children"

Elements such as \textit{[kàmpa]} form a stress group or accent group, which we use in certain cases of neutralisation as a 'distributional unit', in preference to the distributional unit/syllable (e, n, i).

In certain forms, the stress may come on final syllable in the phonological word. I distinguish three different sets of forms of this kind:

\textbf{Set 1}: in these forms, the difference between, say, \textit{[kəwaŋpa]} and \textit{[kəwaŋpá]} may be treated either as mere difference between idiolects, or as a stylistic matter. At any rate, there seems to be no ready means by which this variance might be formalized. The shift in stress to the final syllable of the form here makes no difference to the information-value conveyed by the words qua signs.

\textbf{Set 2}: in the following two forms, there is a difference between the information-value conveyed by the words qua signs:

\begin{itemize}
  \item a. \textit{[maimánta]} "where from?"
  \item b. \textit{[maimántá]} "where to?"
\end{itemize}

As a sequences of phonemes, both are /maimánta/. Grammatically, a. is a sequence of the monemes "/mai/"(where?) and "/maNta/"(from),

\textsuperscript{1}Sets, p56-7.
while b. is a sequence of the monemes "/mai/"(where?), "/maN/"(to) and "/ta/" which may be termed a **connective**. In this case, the stress could be said to indicate the difference between the signs "where to?" and "where from?". This function is still **contrastive** rather than distinctive (although one might be tempted to opt for the latter function), because the fact that the stress is on /ta/ in realisation tells us something about /maN/ i.e. that it is **not** part of the form of the moneme "/maNta/" (in which the stress in realisation is on /maN/). There is nothing to which the stress in realisation of /ta/ can be considered as opposed in a functional way — stress is not a phoneme.¹ The case cited above is unique in San Martín Quechua.

**Set 3**: some forms **always** have the stress on the final syllable of the phonological word. These forms have the moneme "/ta/"(connective) at the end of the word. There are only a few examples: 

- 

  ^[maimantá](where to?);

  ^[imapatá](what for?). There seems to be an element of euphony involved here — the forms 

  ^[máimán] and 

  ^[imápa] are seldom heard. The forms are intuitively 'incomplete', and are usually 'supplemented' by the element "/ta/", which carries very little information-value than roughly "and" in English "and what now?".

The **intonational** features of speech are much more difficult to capture with accuracy. The treatment of such features is bound to

¹Bloomfieldians would have a stress phoneme in the system. See Parker(1965), on Ayacucho Quechua.
be severely limited if one, like myself, does not have access to a spectrogram. It is highly questionable whether it is worthwhile giving an intuitive description of these factors, for such a description can only be of a very crude nature. This is strictly the domain of the skilled acoustic phonetician. I include a short note which gives a very rough account of certain intonational contours.

Broadly, I can isolate the following pitch-contours which are linked with certain expressive uses of sentences:

1. Rising and suspensive.

   This is used for questions. Examples:

   `\[ \]` amigūini šamūikan
   "is my friend coming?"
   maipita kausangi
   "where do you live?"

2. Rising, followed by a sharp fall to lower register.

   This indicates surprise. Examples:

   `\[ \]` mana
   "No(why did you think that?)"
   kusajuk
   "Married!?"

3. Fall from high to low register, then rising.

   `\[ \]` čumbakīwipi
   "In Chumbaquihui"

   This indicates emphasis.
4. Level tone.

ţai mediku maldesídu "that cursed shaman!!"

This indicates anger, seriousness of argument.

It is difficult to improve on these rough indications. The changes in pitch-level in San Martín Quechua speech are very striking, and would repay detailed study by experts with adequate apparatus.

7. General Conclusions.

Much of the existing literature on Quechua cannot be fully understood without a grounding in Bloomfieldian linguistics.

The Bloomfieldian description tends to give a statement about the data in an ad hoc manner, with very little explanation. This methodology is a simpler one than the 'European' one used here, in that it imposes fewer restrictions on the descriptivist. This freedom from restriction, however, allows too much ground to our intuitions, which are rarely sufficient to provide consistent criteria by which to solve problems. Without a rigorous set of principles of analysis (in an integrated theory), the linguist may easily achieve over-all coverage of the data by some means or other, but will find it very difficult to know for certain if he has achieved this coverage in a consistent manner.

Given the unilateral 'inductivist' front put forward by the 'American' school in Quechua studies, I have no reservations about
adding to the existing descriptions of Quechua phonology the present one, which is performed in a deductive way. My description aims at consistency, adequacy and simplicity. We can probably attribute 'adequacy' to existing statements of Quechua, given the limits within which the statements are made, though many (like myself) will find these descriptions somewhat summary and superficial. I would not attribute a high degree of consistency, given the absence of any observable emphasis on this criterion in these works (of course, 'consistency' does not just happen). By our criteria, these descriptions are certainly not simple, for they are very difficult to test.

It is one of the most perplexing problems of Quechua that the existing literature suffers from lack of detail and explanation—a great number of worthwhile projects are paralysed before they begin by insufficient published data and descriptions with which to work. A comparative phonology, for example, is only a remote possibility at present, for the reasons given above.

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1 Bloomfieldians have generally aimed at little more than registering the phonemes and morphemes (together with their meanings) of the dialects which they have studied.
CHARACTERISTICS OF SYSTEM B

1. [b] and [d] after a nasal.

In System A, [p] or [b] after nasal in the same accent group are in free variance. A small set of forms with only [b] after a nasal are treated as exceptional, and listed.

In view of the existence of minimal pairs such as - baka/paka "cow", "hide", the identity of /b/ as a phoneme distinct from /p/ can be established in System B. In this event, the forms with only [b] are to be given as realisations of the phoneme /b/:

/žuNbi/ "belt"
/tiNbu/ "boil"
/žiNba/ "roof"
/žiNba/ "cross river"
/tuNbu/ "variety of fruit"

The free variance hypothesis for [p] or [b] requires to be modified very slightly. The phoneme /b/ does not have a variant realisation [p]. Therefore, we state that after a nasal /p/ has free variant realisations [p] or [b], while everywhere /b/ is realised [b]. That is, /p/ may vary to [b], but /b/ may not vary to [p]. Mulder cites a comparable example in English.¹ The form 'Watt' is always /uot/, but the form 'what' has the variant forms /huot/ and /uot/ in

¹Sets, p192.
certain varieties of English. As forms of 'Watt' and 'what', however, /uot/ and /huot/ may be functionally opposed to one another. We may say that /hu/ may vary to /u/, but /u/ may not vary to /hu/.

In System A, [t] or [d] after nasal in the same accent group are in free variance. There are no forms in System A (ad hoc phonemes are not part of the system) which have only [d]. In System B, however, the form [kwánde] ('"then"') figures. The occurrence of this form renders the situation similar to that for 'p', 'b' above. There is a minimal pair for a phoneme /d/ - di'ia/ti'ia/ ('"day", there is"'). Those instances of [d] only after nasal are described as realisations of the phoneme /d/. We therefore give /kuaNdé/, /punuNderö/ and so on. The phoneme /d/ does not have a realisation [t]. Our statement is analogous to that for 'p', 'b' above. After nasal, /t/ has free variant realisations [t] or [d], while /d/ is realised everywhere as [d]. That is, /t/ may vary to [d], but /d/ may not vary to [t].

2. [g] after a nasal.

The phonemes /k/ and /g/ are functionally opposed in System B:

pakara/ pagara ('"hide now", "pay")

The opposition between /k/ and /g/ brings some troublesome consequences. Recall the hypothesis for [k] and [g] in System A. The realisations [k] and [g] are combinatory variants of /k/, [g]
occurring after a nasal in the same accent group, [k] occurring elsewhere (except before /æ/). In their respective contexts, [k] and [g] are mutually exclusive.

For System B, we have to consider the following forms (and some others like them):-

1. brînka  "leap"
   bînko  "bench"
2. garapâta  "type of insect"
   gâna  "win"

Here, [k] occurs after nasal in the same accent group, while [g] may occur apart from that context. The contexts which, by being mutually exclusive, lead to the combinatory variance hypothesis for [k] and [g] in System A are not mutually exclusive in System B.

There is no alternative in System B but to drop the variance of [k] and [g] from the description, even though our intuitions tell us that in the scores of cases where [g] occurs after nasal in the same accent group (excepting, perhaps, 'Spanish' forms) it is not the realisation of the phoneme /g/, but of the phoneme /k/. There are scores of forms like the following:

[pûngu], [ûngu], [kânga], [pânga], [tânga] etc., etc.

The phoneme /g/ for these forms is counter-intuitive, because in
the same accent group after nasal, /ɡ/ occurs in the very great majority of cases, while /k/ occurs in only two or three 'Spanish' forms. In addition, with the exception of a very few 'Spanish' forms, /ɡ/ can come only after a nasal in the same accent group. There are no forms such as these imaginary ones:

[músgo]*, [áźga]*, [pаíga]* etc., etc.

We have to make a distributional statement to the effect that the only phoneme which may precede /ɡ/ in the same accent group is the archiphoneme /N/.

In this thesis, I am not concerned with choosing between Systems A and B, for it may not be possible to do so. Nevertheless, the above is one argument in favour of System A for those linguists who dislike counter-intuitive statements. The forms with [k] after nasal are very few; the forms with [ɡ] not after nasal are very few. Reasonable people will argue as to whether we should:

a. Omit the marginal elements and maintain [k] and [ɡ] as combinatorial variants of /k/.

OR b. Include the marginal elements and establish a phoneme /ɡ/.

What is perfectly clear is that we must not choose between a. and b. (above) independently of the total descriptions of which they are a part. If we wish to make a choice, it must be between the two systems. We cannot 'mix' together statements from two different
descriptions in an attempt to have the 'best of both worlds'.

Before /zą/ in the same accent group, System A has a combinatorial variant [g] of the phoneme /k/. In System B, the two forms in which [g] occurs before [zą] in the same accent group require our attention. This will provide part of the subject matter of the following section.

3. Neutralisation of Occlusives in 'i'.

Omitting the two forms [ągża] and [wagżici] for the moment, in the implosive position, of the set [p t k b d g], only [p t k] occur. The archiphonemes /B D G/ are given in this position.

Where the groups 'ks' and 'gę' are concerned, we must give the context of [k] and [g] as the succeeding item in the same accent group. In this case, the [g] of the two forms cited above is given as a realisation of the archiphoneme /G/, but of that archiphoneme in the context 'before /zą/'; the realisation [k] in the group 'ks' is given as a realisation of the archiphoneme before /zą/ in the same accent group. Only in the cases of /gś/ and /Gę/ is the context for the neutralisation the accent group. In all other cases, we may regard the context for the series of neutralisations as mere implosive position.

We may say that in 'i' only [p t k] occur, but that, in those cases where a succeeding phoneme in the same accent group is a context, either [k] or [g] may occur. The archiphoneme /G/ (but not

---

1The realisations [k] and [g] are in combinatorial variance.
/B/ and /D/) has therefore two generating contexts.

I will now demonstrate how the archiphonemes /B D G/ are conceived. Firstly, the archiphoneme /B/, which is the product of /p/ and /b/. In the 'explosive' position, which may be 'el' or 'E', we have the following classes of distinctive features:

- /p/ : \{unvoiced, labial, occlusive\}
- /b/ : \{voiced, labial, occlusive\}

Set-theoretically:

![Venn diagram](image)

Here, the intersection 'labial occlusive' is bracketed, because the classes in 'el' and 'E' are disjoint. The phoneme /p/ is opposed to the phoneme /b/ by the distinctive features 'unvoiced' ∪ 'voiced'. In 'i', this opposition is neutralised. We could
not establish a phoneme /p/ in 'i' because, in the absence of an opposition between 'unvoiced' [p] and 'voiced' [b], there is no way by which 'unvoiced' can be shown to be a feature of the tentative phoneme /p/. The phonological item in 'i', though realised [p], has the features 'labial, occlusive', while the phoneme in 'e', also realised [p], has the features 'unvoiced, labial, occlusive'. The former is the archiphoneme /B/, the latter the phoneme /p/. The archiphoneme /B/ is conceived as follows:

Fig. 11.

The archiphoneme /B/ has the features 'labial, occlusive'. It is a phoneme in the subsystem in 'i' /N B D G Æ Ĝ l r s ŋ i u/ which, when projected into the over-all system, is represented there by the two phonemes /p/ and /b/.

The conception of the archiphoneme /D/ is very similar. In the
'explosive' position, which is either 'el' or 'E', the classes of distinctive features are:

\[
\begin{align*}
/t/ & : \{\text{unvoiced}, \text{apical}, \text{occlusive}\} \\
/d/ & : \{\text{voiced}, \text{apical}, \text{occlusive}\}
\end{align*}
\]

Set-theoretically:

Fig. III.

As above with /p/ and /b/, the intersection is bracketed, because the classes in 'el' or 'E' are disjoint. The phoneme /t/ is opposed to the phoneme /d/ by the features 'unvoiced' ∨ 'voiced'. In 'i', this opposition is neutralised, and the archiphoneme /D/ is given. Fig.IV., on p198, shows how the archiphoneme /D/ is conceived. The archiphoneme /D/ has only the features 'apical, occlusive'.

In 'explosive' position, which is either 'el' or 'E', /k/ and /g/ are opposed in a functional way. The classes of distinctive
Fig. IV.

Features being:

/k/ : \{unvoiced, dorsal, occlusive\}

/g/ : \{voiced, dorsal, occlusive\}

Set-theoretically:

Fig. V.

In 'i', the opposition 'unvoiced' \(\cap\) 'voiced' is neutralised. The
archiphoneme /G/ is conceived as follows:

The archiphoneme /G/ has as its features 'dorsal, occlusive'.

The archiphonemes /B/, /D/ and /G/ are opposed to one another by the features 'labial' ∨ 'apical' ∨ 'dorsal'. The occlusive series in 'i' is opposed to the 'sibilant' and 'vocalic' series, and to the archiphoneme /N/ (which represents the nasal series before any phoneme in the same accent group).

4. A Short Note on the Archiphoneme /N/.

System B has the archiphoneme /N/ before any phoneme in the same accent group. The conception of this phoneme is strictly analogous to that for System A, and is given in Fig. VII., on p200.¹

¹The analogy to System A rests on our establishing a phoneme /n/ in System B, and not a sequence of two phonemes /ni/. My reasons for opting for a phoneme /n/ are given on p203 et seq.
This archiphoneme has the feature 'nasal' only, and is represented in the over-all system by the three phonemes /m/, /n/ and /ŋ/.

The archiphoneme /N/ in System B is rather exceptional in the description, in that it can be established without any problems over and above those which we have to overcome in System A. It figures in 'Spanish' forms as follows:

- /briNka/ "leap"
- /maNgua/ "mango"
- /laNča/ "boat"
- /kaNta/ "sing"
- /abaNkarga/ "front-load gun"
The conditions under which the neutralisation is generated in System A (see p83) are paralleled in System B i.e. the succeeding phoneme in the same accent group.

This hypothesis can only be maintained, as in System A, by omitting from the description proper the four forms /uamra/, /zanua/\(^1\), /kimsa/ and /tamia/, which must be treated in an ad hoc fashion.

The diachronic explanation for the absence of any conflict with respect to the introduction of 'Spanish' nasals in this context may well lie in the fact that mestizo Spanish has a formally similar 'nasal' series /m n ŋ/, and b. an archiphoneme /N/ before any phoneme in the same accent group. The introduction of 'Spanish' forms into the description, at this point, therefore, is not to be expected to bring about any startling results.

5. Synonymous Forms with o/u and e/i.

The 'o'/'u' and 'e'/'i' phenomena were discussed at some length in VII. In System B, the establishment of phonemes /o/, /u/, /e/ and /i/ is demanded by virtue of the following commutations:

- o/u : čoro/čuru "monkey"/"snail"
- e/i : kena/kina "flute"/"fruit variety"

\(^1\)As will be explained in due course, in System B, these two forms are /uambra/ and /žanua/.
These pairs secure the identity of /o/ and /e/ as phonemes in System B. The only difference between the statements of these phenomena in Systems A and B lies in the fact that in System A, /o/ and /e/ were established in an ad hoc way. In System B, they are establishable by commutation, and figure in the classificatory calculus.

Variant realisations such as [sókta] and [súkta] present the same difficulty in System B as in System A. The statement according to the upper limit of distinctive realisation, discussed in VII, founders on the problem of forms such as the following:

\[ \text{brúxo} \]
\[ \text{brúxu} \]

I can find no way (except by an arbitrary choice) of establishing whether it is the upper limit of distinctive realisation of a tentative /o/ which is suspended, or the upper limit of a tentative /u/. Diachronic considerations - e.g., the fact that the mestizo Spanish form is /brúxo/ - suggest that, if anything, we should opt for a phoneme /o/ and state that, when this phoneme is realised [u], the upper limit of its distinctive realisation ('half' in 'half-close') is suspended. In our description, decisions about a system must be made on the basis of synchronic criteria. We cannot evoke diachronic 'facts', such as references to other systems, in order to solve a synchronic problem. In this case, I find that any synchronic criteria
which might help us to avoid an arbitrary choice between /o/ and /u/ in those numerous cases where we have to make such a choice (if we use the 'upper limit of distinctive realisation' criterion) are absent.

The most consistent and adequate description is to give "/bruxo/" and "/bruxu/" as synonyms for "witch". The forms "/sokta/" and "/sukta/" are synonyms for "six".

For brevity in representation, I adopt the convention of placing an umlaut over /ē/ which symbol denotes that in addition to a form with the phoneme /o/ there is a form with the phoneme /u/. The same practice is adopted for /ī/, where the umlaut denotes that in addition to the form with a phoneme /u/ there is a form with the phoneme /i/.

The only partial restriction to the occurrence of such forms lies in the non-occurrence in many (but not all) cases of combinations in adjacent syllables such as /u/ + /o/, and /i/ + /e/ (see p110).

6. /ū/, /ē/, /ī/, /ī/.

In a description in terms of (e₁, e₂, n, i), it must be established whether the phonemes /ū/, /ē/, /ī/ and /ī/ may be described as single phonemes or not. Taking only one example, it is possible to treat /Ū/, not as a single phoneme /ū/, but as a sequence of the two phonèmes /n/ and /i/ in 'el' and 'e2' respectively. It may be the case, in fact, that such a description is obligatory in a syllable (el, e₂, n, i).
In a syllable (el, e2, n, i), it is possible to treat [ŋ] as the realisation of two phonemes /ni/. The realisation [ŋ] may be described as a simultaneous bundle of distinctive features. In System A, this is a simultaneous bundle of distinctive features extending over only one position in the chain (i.e. it is in 'e' of (e, n, i)). In System B, there are no grounds for maintaining that [ŋ] is a simultaneous bundle of distinctive features extending over only one position. It could be described as /n/ plus /i/, in 'el' and 'e2' respectively. Note that in 11 I explained that it is possible to have phonemes in relations of simultaneity (p24).

If we describe [ŋ] as /ni/, then we can no longer regard the following as a minimal pair for /m/ ~ /n/:

[mama] "mother"
[maña] "ask"

In System A, this pair is /mama/ and /maña/. In System B, it would be /mama/ and /manía/, as follows:

/ma0-ma0/
/ma0-nia0/

The phoneme /m/ occurs in 'E' (the archiposition) only. We find that in nearly every case where we attempt to commute /n/ in the combination /ni/, we find that a phoneme commutes, not with /n/, but with the combination /ni/. For example:

1There is a commutation between /m/ and /ni/, but this is trivial.
I can find no minimal pair for /n/ in the combination /ni/. The combination /ni/, which is a simultaneous bundle, commutes as a whole with nearly every item in the inventory.

The fact that /ni/ becomes a possibility in System B is directly traceable to the introduction of 'Spanish' forms. Intuitively, however, the element [ŋ̃] occurs in nearly every case in Quechua forms, which may be adequately described by the three-position unit (e, n, i), and a phoneme /ñ/. If we maintain a phoneme /ñ/ in System B, it comes always in the archiposition 'E'.

The description /ni/ is not a good description of the data, and makes for difficulties in performing commutations. It makes the commutations which are 'basic' to Quechua impossible. Neither /n/ nor /i/ in the combination /ni/ can be commuted with any other item. Instead, they commute as a simultaneous bundle, i.e. in combination with one another (and they are in relations of simultaneity). I hold that the description according to /ñ/ should be maintained in System B.

There is no doubt that this is one of the most perplexing problems in System B. It is a problem which casts great doubt on the feasibility of the attempt to describe all the data together in one system. There is no way the problem can be removed; it appears that it is not possible to make a description at all if we maintain /ni/
as two phonemes.

/ɔ/ or /tɔ/, /ɔ/ or /si/.

Without going into great detail here, the problem of /ɔ/ can be solved in the following way. In 'Quechua' forms, we always have a realisation [ɔ] i.e. there is no trace of a semi-vowel [j] at all. The realisation is a simple 'hush', similar to English 'ship'. In 'Spanish' forms, we do not find this realisation, but we have a realisation [sj] as in [sjempri].

In System A, the 'Spanish' forms, with the realisation [sj], even though treated in an ad hoc way, must be brought into line with the distributional unit (e, n, i), in which case they can only be described by a single phoneme /ɔ/ - therefore we give /seŋpre/.

In System B, the way is open to treat the 'Spanish' forms with [sj] as realisations of the phonemes /s/ plus /i/ in 'el' and 'e2' respectively.

The only question is: can we still maintain a phoneme /ɔ/ in System B, or is the realisation [ɔ] also phonologically /si/? That a description /si/ clashes with the system is evident from the description of the form [ʃimi] as /ʃiimi/, because the combination (phonetic)[jɪ] will not figure in the system apart from in this one tentative case. The description of a form such as [kásпа] would pose a problem also. The description /si/ would not fit here - /kasipa/.

We should treat the 'Spanish' [sj] as /si/ and the 'Quechua' [ɔ]

1 As far as I know, there is no variety of Spanish which has a phoneme /ɔ/, or a truly 'palatal' realisation [ɔ].
Given the existence of phonemes /t/ and /s/ in the system, and the possible phonetic protocolization of [Z] as [tʃ]¹, we must decide whether or not the tentative /Z/ might not be better treated as /t/ + /s/.

One reason against doing this is that pose2 (r, 1, i, u), which accounts for the great majority of the data is changed to (r, 1, ñ, i, u) for the sake of a tentative combination /tʃ/ in 'el' and 'e2'. This is counter-intuitive because, unlike in English, where /tʃ/ can be regarded as the correlate of /dʒ/, it is unconvincing in Quechua to regard a tentative /tʃ/ as the correlate of /dʒ/. Even if we were to take this step, we should still arrive at a single phoneme hypothesis for [tʃ], as can be shown if we consider the form [útʃku]("hole"). There is only one implosive position in the system, therefore the first syllable of [útʃku] has to be described as:

\[
\begin{array}{c|c|c}
E & n & i \\
1 & u & tʃ \\
\emptyset & \\
\end{array}
\]

Given that there is no justification either for establishing two implosive positions(for the sake of one set of forms in the data), or for maintaining a phoneme /ʃ/ which is distributionally limited to the implosive position, we should treat [tʃ] as the realisation of a single phoneme /ʃ/, which operates in 'E' and 'i'.

/ʃ/(OVER).

¹ See EGL, 3.23.
The tentative /dZ/ (two phonemes) instead of /Z/ (one phoneme) fails for the same reason as the tentative /tS/. Even if this hypothesis works out reasonably well in the explosive positions, it does not work in the implosive position — [udZku] has to be given as /uZku/. I have provided reasons for preferring the hypotheses /S/ and /Z/ over and above the counter-intuitive nature of the phonetic protocols [tS] and [dZ]. Personally, I have never found Martinet's insistence upon these protocols to be convincing.1

7. Aspects of the Vowel System.

The vowel system of System B is as follows:

<table>
<thead>
<tr>
<th>Rounded</th>
<th>Close</th>
<th>Spread</th>
</tr>
</thead>
<tbody>
<tr>
<td>half</td>
<td>o</td>
<td>e</td>
</tr>
<tr>
<td>full</td>
<td>u</td>
<td>i</td>
</tr>
</tbody>
</table>

In the unit (el, e2, n, i), where 'e2' is empty or filled by /r/ or /l/, or in (E, n, i), /e/ is opposed to /i/ in a functional way.

When 'e2' is filled by either /u/ or /i/, there is a restriction to the inventory in the nuclear position. We find 'bwe' but never 'bwi', and 'bje' but never 'bji'. It is worthwhile to spend a little time explaining how this should be treated, for it is a problem of considerable significance.

One solution is to posit an archiphoneme /E/, giving /buE/ and

1EGL, 3.23.
and /biE/. The other is to explain the non-occurrence of [i] here in terms of the phoneme /i/, and a distributional rule. This distributional rule states that when 'el' is filled, and 'e2' is filled by either /i/ or /u/, the phoneme /i/ may not occupy the nuclear position.

It is possible to generate an archiphoneme /E/ which has the feature 'spread'. This is one case where the simplicity criterion has to be applied. If we conceive of this criterion in the way I do, I believe that a choice can be made in favour of the description in terms of distribution by applying that criterion. The description in terms of distribution can be simply and directly refuted by an example of the phoneme /i/ coming in the distributional context which I have precluded. ¹

Similar restrictions to the occurrence of /o/ and /u/ in the nuclear position are better described in terms of distributional rules. I refer to the non-occurrence of /o/ after /u/, and to the non-occurrence of /u/ in the same context, no matter whether /u/ is in 'e2' or 'E'.

8. Further Instances of Variance.

There is nothing in System B which affects the following descriptions of variance explained for System A. They may be restated for System B with only slight modifications to the distrib-

¹Mulder(Sets, p206)discusses similar problems, citing among others the example of the non-occurrence of /g/ after /l/ in English. He opts for a distributional explanation on the grounds of simplicity.
ution of the items in question:

1. /u/ : has the combinatory variant realisations [w], [u] and [\u]. The realisation [w] occurs in 'e2' or 'E'; [u] occurs in 'n'; [\u] occurs in 'i'.

2. /i/ : has the combinatory variant realisations [j], [i] and [\i]. The realisation [j] occurs in 'e2' or 'E'; [i] occurs in 'n'; [\i] occurs in 'i'.

3. /\z/ : in 'E', /\z/ is realised either [tj] or [t]; in 'i', it is realised [t]; in both 'E' and 'i', it may be realised [\z]. Of these realisations, [\z] is the most common in every position.

4. /G/ : the data described by /G/ in System B is described by a phoneme /k/ in System A. Before /\z/, in the same accent group, /G/ has a combinatory variant realisation [g]. In 'i', the realisations [k] or [x] are in free variance as realisations of /G/.

9. Additional Remarks on System B.

Some diachronically 'Spanish' forms such as [sjémpri], with the realisation [sj], occur in the data. In System A, these are described by the phoneme /\z/: /\SiNpr\o/, /komérga\Nt\o/, /négosakuk/. In System B, they are described in a manner which approximates formally to mestizo Spanish - the above four forms in System B are /\SiNpr\o/,
/komërsiaNte/, /nëgosiaKuk/. This comes about because of the use of a four-position syllable, which syllable, having two explosive positions, is similar to that required for mestizo Spanish. This explains the intuitive similarity of the 'Spanish' forms in System B to their mestizo Spanish counterparts, while in System A those 'Spanish' forms assume quite different shape because of the three-position syllable.

A similar set of forms in System A are described by the phoneme /di/. They are forms which have the realisation [d̪] in them e.g. [méd̪o], [d̪ablo], [gward̪a]. These are 'Spanish' forms. In System A, where we cannot establish a combination /di/, they are described as /meγ̪o/, /γ̪ablo/, /guarγ̪a/. In System B, they are described as /mediγ̪a/, /diabγ̪o/, /guardiγ̪a/. As in the case above, the description in System B approximates much more closely to that of the mestizo Spanish counterparts.

The form of the moneme for "young man" poses a problem in System A. This form has the realisations [wā̊n] and [gwā̊na]. It is an exceptional case. In System A, I treated this form as exceptional, and stated that on this one occasion /u/ has a realisation [gw]. The statement in System B is much more satisfactory — the statement we must make is that "young man" has "/uain/" and "/guain/" as synonyms. This description is much more straightforward in System B, for in that system we have a syllable with two explosive positions, which enables us to describe complexes such as /gu/.
In System B, there does not appear to be any case for treating the [b] in [wam bracelet] or the [g] in [zang bracelet] as a parasitic consonant. In System A, [b] and [g] cannot be described as phonemes, unless we are to take the counter-intuitive step of aligning the above two forms along with the 'Spanish' set which have complex items in the explosive position. In System B, we can describe [wam bracelet] as /uambra/ and [zang bracelet] as /Zangua/. This statement makes no difference as far as the neutralization of nasals is concerned. These two forms still have to be left out if we wish to regard a succeeding phoneme in the same accent group as a generating context for the neutralization between nasals.

In System B, /l/ figures in both 'e2' and 'E' of the explosive group and in 'i'. In this system, we find /l/ often where diachronically we expect to find /d/. Here are two examples:

System B  mestizo Spanish
almíti         admíti
almíra         admíra

This kind of diachronic 'fact' can only strengthen my view that it is an oversight of Bloomfieldian linguists who have described Quechua to include the 'Spanish' form /d/ in the system without noting its non-occurrence in the implosive position. In my System B, I have the archiphoneme /D/. There appear to be strong intuitive phonetic grounds for maintaining such a description - 'voiced'
occlusives in syllable-final position are not a feature of Quechua. The non-occurrence of such occlusives in this position should be noted.
1. The Distributional Unit.

Given that we have a fairly large set of tentative syllables such as /tra/, /tre/, /blo/ etc., the optimum distributional unit for describing all the data in one system is of four positions, as follows:

<table>
<thead>
<tr>
<th>el</th>
<th>e2</th>
<th>n</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>r</td>
<td>a</td>
<td>Ø</td>
</tr>
<tr>
<td>t</td>
<td>r</td>
<td>e</td>
<td>Ø</td>
</tr>
<tr>
<td>b</td>
<td>l</td>
<td>o</td>
<td>Ø</td>
</tr>
</tbody>
</table>

In this description, we have an archiposition 'E', which is the product of el and e2. This is necessary because, in the case of a tentative syllable such as /kuk/, the initial /k/ cannot be assigned to either 'el' or 'e2':

<table>
<thead>
<tr>
<th>el</th>
<th>e2</th>
<th>n</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>k</td>
<td>Ø</td>
<td>u</td>
<td>k</td>
</tr>
<tr>
<td>Ø</td>
<td>k</td>
<td>u</td>
<td>k</td>
</tr>
</tbody>
</table>

The element 'Ø' (zero) is meaningless here. There is no phoneme which could come in the positions occupied by 'Ø' in the two tentative descriptions of /kuk/ given above. We only use 'zero' to indicate
a position which could be filled, but is not (in a given case) filled.

Repeating 1V, the archiposition 'E' is conceived as the intersection of the classes 'e1' and 'e2':

Fig. 1.

From the distributional unit (el, e2, n, i), two syllables are conceived which are (E, n, i) and (el, e2, n, i). These two syllables are subsets of the distributional unit.

One feature of System B is that a syllable such as /ra/ cannot be assigned in a clear-cut way to either (el, e2, n, i) or to (E, n, i). It has to be given as a member of both syllables. By /tra/ \(\sim\) /ra/, for example, /r/ is assigned to 'e2' of (el, e2, n, i). In this
event, the syllable /ra/' is described as follows:

\[
\begin{array}{cccc}
\text{el} & \text{e2} & \text{n} & \text{i} \\
\emptyset & r & a & \emptyset \\
[t] & r & a & \emptyset \\
\end{array}
\]

However, if we consider the tentative syllable /ras/, we find that we have to assign /r/ to 'E' of (E, n, i), because neither a. nor b. (below) is tenable in terms of the description:

\[
\begin{array}{cccc}
\text{el} & \text{e2} & \text{n} & \text{i} \\
a. & \emptyset & r & a & s \\
b. & r & \emptyset & a & s \\
\end{array}
\]

There is no phoneme which could fill 'el' in a. nor 'e2' in b. In such a case, the only way to avoid an arbitrary decision is to assign /r/ to both 'e2' and 'E', and the syllable /ra/ to both (el, e2, n, i) and (E, n, i).

2. Position Classes.

posel : p t k b d g f r s \emptyset
pose2 : l r i u \emptyset
posE : p t k m n ħ l ā ē r s ā xi u \emptyset
posn : a e i o u
posi : N B D G l ā ē r s ā xi u \emptyset

A useful class for reference at this stage is the one of the kind
The class of phonemes which can come only in 'el' and so on. In order to calculate the full set of classes of this kind in a system which uses a unit (el, e₂, n, i), we use a Marquand Graph for five classes:

Fig. 11.

The classes are:

'el' only : b d g f
'E' only : m n ñ x
'el', 'E' : p t k
Compare these classes with the corresponding classes for System A on p115.

The above classes, termed **main distribution classes**, assume greatest importance in the statement of phonematic distribution. In the present context, they are useful for comparison with **F6g**s (to be established in this chapter). Intuitive correspondences between these two kinds of class in a language provide a rough guide as to the 'balance' of the system. In System A, the correspondence between main distribution classes and **F6g**s is almost a one-to-one correspondence. This 'simplicity' is not paralleled in System B.

3. **Strict and Phonematic Paradigms.**

In System B, several **S6par**s can be found for items such as /b/.

Here is an **Spar** for /b/: baka/paka/taka/iaka/maka/ñaka/uaka ("cow", "hide", "sprain", "almost", "fight", "bewitch", "cry")
Strict paradigms are a stepping-stone to phonematic paradigms which, as I explained in VIII, 4, are conceived of as the sum of strict paradigms. If we have an Spar - baka/paka/taka/iaka/maka/ñaka/uaka, and another Spar - bara/kara/sara, we can posit a tentative paradigm for /b/ of /b p t k m ñ s i u/, pending our checking through all possible Spars for /b/ in case any have been missed. If we find another Spar, this must be added to the existing par, which is, as I said, the sum of Spars.

It is a feature of System B that there are no Spars for items in 'el' or 'e2'. This is a result, we can only assume, of the limited nature of the set of forms which use these positions. The 'Spanish' forms such as /trabaxa/ make it necessary for us to use a unit with two explosive positions, but, in fact, the paradigmatic potential of items in those explosive positions is not realised.

4. Commutation Classes and Connective Opposition Classes.

The procedures for establishing coms and Cops were explained in VIII, 5/6. The coms of System B are given in Fig. 111, p220. These may be compared with the coms of System A, which are given in Fig. 1V., p221.

In System B, the occurrence of the phonemes /b/ and /g/ in 'E' after a nasal e.g. in /cINba/ and /kANga/ means that several Spars come into play which did not figure in System A. For example, /b/ is opposed to /g/ in the pair - cINba/cINga("cross river", "disappear"). Spars such as - kaNpa/kaNta/kaNga/kaNra are also
Fig. 111.

The Cons of System B
The Conf of System A

<table>
<thead>
<tr>
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</tbody>
</table>
productive. In addition, in System A, there are several spars which do not figure in System B. In System A, the pair - uNku/urku served to establish the identity of /N/ and /r/. In System B, the forms are /uNgü/ and /urku/ - this is no longer a minimal pair for /N/ and /r/.

The Cops of System B are:

- **Cop1**: b g p t k m č s i u
- **Cop2**: b ř Ø
- **Cop3**: g n ž r s
- **Cop4**: p t k m n ř ž č r s š i u Ø
- **Cop5**: d p t ř ž č r s š i u
- **Cop6**: l p k m n ř č r s š
- **Cop7**: N ž s š u Ø
- **Cop8**: a e o i u
- **Cop9**: B N
- **Cop10**: D ž č r Ø
- **Cop11**: G N
- **Cop12**: f p k Ø
- **Cop13**: x n

The Cops are useful in that they enable us to establish subsystems and an over-all system on the basis of distinctive features. From the Cops of System B, Cops 1, 4, 5, 6, and 8 enable us to establish subsystems. The other Cops are too limited - the phonemes in them
cannot be included in subsystems which have every phoneme the product of a **series** and an **order**.

**Subsystem 1(Cop 1):**

<table>
<thead>
<tr>
<th></th>
<th>unvoiced occlusive</th>
<th>voiced occlusive</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td>b</td>
<td>u</td>
</tr>
<tr>
<td>palatal</td>
<td>ĉ</td>
<td>i</td>
<td></td>
</tr>
<tr>
<td>dorsal</td>
<td>k</td>
<td>ġ</td>
<td></td>
</tr>
</tbody>
</table>

[Unclassified: /t/, /m/, /s/]

**Subsystem 4(Cop4):**

<table>
<thead>
<tr>
<th></th>
<th>unvoiced occlusive</th>
<th>voiced occlusive</th>
<th>nasal</th>
<th>sibilant</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td>m</td>
<td>u</td>
<td></td>
<td></td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>n</td>
<td>s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>palatal</td>
<td>ĉ</td>
<td>ĺ</td>
<td>ŋ</td>
<td>ī</td>
<td></td>
</tr>
</tbody>
</table>

[Unclassified: /k/, /r/]

Subsystem 4 parallels almost exactly the over-all system in System A. This is a direct result of the fact that the large Cop of system A can be carried over into System B, where it serves to generate the
above subsystem.

Subsystem 5 (Cop5):

<table>
<thead>
<tr>
<th></th>
<th>unvoiced occlusive</th>
<th>voiced occlusive</th>
<th>sibilant</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td></td>
<td></td>
<td>u</td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>d</td>
<td>s</td>
<td></td>
</tr>
<tr>
<td>palatal</td>
<td>ç</td>
<td>ù</td>
<td>ü</td>
<td></td>
</tr>
</tbody>
</table>

[Unclassified: /ʊ/, /r/]

Subsystem 8 (Cop8):

<table>
<thead>
<tr>
<th></th>
<th>close</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>half</td>
<td>full</td>
</tr>
<tr>
<td>rounded</td>
<td>o</td>
<td>u</td>
</tr>
<tr>
<td>spread</td>
<td>e</td>
<td>i</td>
</tr>
</tbody>
</table>

Subsystem 8 is the vowel system of System B. My choice of labels for 'close' vowels is merely for convenience. I could equally have used the terms 'half-close' and 'close'.

In the consonantal system, /f/ and /x/ must be included in a 'fricative' series. I can find no grounds for maintaining a 'sibilant' series separate from this 'fricative' series, because

1 Note that, in System B, as in System A (p32, p122), /a/ is outside the system. It has only the feature 'a-ness.'
there are no 'sibilants' which are not 'fricative' in this system (nor perhaps in any system). I include /f s ɕ x/ together in a fricative series. In view of the existence of phonemes /g/ and /x/, of the 'dorsal' class, the phoneme /k/ is part of the overall classification in System B, for that phoneme can be shown to be the product of an order and a series. The phonemes /l/ and /r/ remain outside the system. They have the features 'l-ness' and 'r-ness' respectively. The consonantal over-all system for System B:

<table>
<thead>
<tr>
<th></th>
<th>unvoiced oclusive</th>
<th>voiced oclusive</th>
<th>nasal</th>
<th>fricative</th>
<th>vocalic</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>p</td>
<td>b</td>
<td>m</td>
<td>f</td>
<td>u</td>
</tr>
<tr>
<td>apical</td>
<td>t</td>
<td>d</td>
<td>n</td>
<td>s</td>
<td></td>
</tr>
<tr>
<td>palatal</td>
<td>ġ</td>
<td>ĺ</td>
<td>ļ</td>
<td>ģ</td>
<td>i</td>
</tr>
<tr>
<td>dorsal</td>
<td>k</td>
<td>g</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

[Unclassified: /l/, /r/]

5. Functional Equivalence Classes.

The diagram which, theoretically, we require to calculate the Freqs of System B is too complicated to be included here. The power set of classes to be considered as potential Freqs is $2^{13} - 1$ i.e. 8,191 classes.

In cases such as these, one can take a short-cut to the Freqs
by noting the Cops in which a phoneme occurs, and by grouping
together those phonemes which belong to the same Cops. We may
note one of Mulder's definitions for functional equivalence
classes:

'sets of phonemes which belong to the same Cops'

The Freqs of System B are as follows:-

<table>
<thead>
<tr>
<th>Freq</th>
<th>Phonemes</th>
<th>Corresponding Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>FreqA</td>
<td>1,4,5,7,8</td>
<td>i, u</td>
</tr>
<tr>
<td>FreqB</td>
<td>1,4,5,6,12</td>
<td>p</td>
</tr>
<tr>
<td>FreqC</td>
<td>1,4,5</td>
<td>t</td>
</tr>
<tr>
<td>FreqD</td>
<td>1,4,6,12</td>
<td>k</td>
</tr>
<tr>
<td>FreqE</td>
<td>1,2</td>
<td>b</td>
</tr>
<tr>
<td>FreqF</td>
<td>5</td>
<td>d</td>
</tr>
<tr>
<td>FreqG</td>
<td>1,3</td>
<td>g</td>
</tr>
<tr>
<td>FreqH</td>
<td>12</td>
<td>f</td>
</tr>
<tr>
<td>FreqI</td>
<td>13</td>
<td>x</td>
</tr>
<tr>
<td>FreqJ</td>
<td>6</td>
<td>l</td>
</tr>
<tr>
<td>FreqK</td>
<td>1,4,6</td>
<td>m</td>
</tr>
<tr>
<td>FreqL</td>
<td>3,4,6,13</td>
<td>n</td>
</tr>
<tr>
<td>FreqM</td>
<td>2,4,5,6</td>
<td>ñ</td>
</tr>
<tr>
<td>FreqN</td>
<td>3,4,5,7,10</td>
<td>Ñ</td>
</tr>
<tr>
<td>FreqO</td>
<td>1,4,5,6,10</td>
<td>Ñ</td>
</tr>
<tr>
<td>FreqP</td>
<td>3,4,5,10</td>
<td>r</td>
</tr>
</tbody>
</table>

\[1\] Sets, pl40.
One salient feature of this set of classes for System B is the 'break-down' of F and G of System A into a great number of smaller classes. Between them, F, F k, t, Z, r, 5 constitute a class p, t, k, Z, t, r, s, 5 which is the intuitive 'centre' of the consonant system of System A. This set of phonemes operates in the same pos in System A (which is 'e'/1'), and are members of one and the same cop. Similarly, the 'nasal' set {m, n, 5}, which belong to F a and pose in System A, each constitute a single class in System B. Such conclusions are the nearest we can get in a synchronic description to pointing out a certain degree of imbalance in the system which incorporates 'Spanish' forms.

In System A, there is a virtual one-to-one correspondence between main distribution classes and F. The correspondences for System B are much less obvious. Only the classes {i, u} and {a, e, o}

1 See pl25-6.
partake in any significant correspondence. Here are the correspondences:

<table>
<thead>
<tr>
<th>MDis 1</th>
<th>Feq</th>
</tr>
</thead>
<tbody>
<tr>
<td>'el' only</td>
<td>Feqs E + F + G + H</td>
</tr>
<tr>
<td>b d g f</td>
<td></td>
</tr>
<tr>
<td>'E' only</td>
<td>Feqs K + L + M + I</td>
</tr>
<tr>
<td>m n o x</td>
<td></td>
</tr>
<tr>
<td>'el', 'E'</td>
<td>Feqs B + C + D</td>
</tr>
<tr>
<td>p t k</td>
<td></td>
</tr>
<tr>
<td>'E', 'i'</td>
<td>Feqs N + O + R</td>
</tr>
<tr>
<td>Z E S</td>
<td></td>
</tr>
<tr>
<td>'E', 'e2', 'n', 'i'</td>
<td>Feq A</td>
</tr>
<tr>
<td>i u</td>
<td></td>
</tr>
<tr>
<td>'E', 'e2', 'i'</td>
<td>Feq J</td>
</tr>
<tr>
<td>l</td>
<td></td>
</tr>
<tr>
<td>'E', 'el', 'e2', 'i'</td>
<td>Feq P</td>
</tr>
<tr>
<td>r</td>
<td></td>
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<tr>
<td>'E', 'el', 'i'</td>
<td>Feq Q</td>
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<tr>
<td>s</td>
<td></td>
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<tr>
<td>'n', only</td>
<td>Feq W</td>
</tr>
<tr>
<td>a e o</td>
<td></td>
</tr>
<tr>
<td>'i', only</td>
<td>Feqs S + T + U + G</td>
</tr>
<tr>
<td>N B D G</td>
<td></td>
</tr>
</tbody>
</table>

Very little of significance can be induced from these correspondences. System B displays little of the balanced and close-knit character of

\[1\text{MDis} = \text{'main distribution class'}\]; see p.114
System A.

If we compare the Feqs of Systems A and B, we note that there is a considerable increase in the number of Feqs in System B, as compared with System A. The implications of the inclusion of 'marginal' elements were discussed at some length in connection with the phonemes /l/ and /b/, and will not be further discussed in detail here. ¹

Here are the Feqs of Systems A and B in a scheme in which I treat the Feqs of System A as sums of the Feqs of System B:

<table>
<thead>
<tr>
<th>System A</th>
<th>System B</th>
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</thead>
<tbody>
<tr>
<td>FeqA: m n ŏ</td>
<td>Feqs K + L + M</td>
</tr>
<tr>
<td>FeqB: a</td>
<td>/a/ is a member of FeqW,</td>
</tr>
<tr>
<td></td>
<td>along with /e o/</td>
</tr>
<tr>
<td>FeqC: N</td>
<td>FeqS</td>
</tr>
<tr>
<td>FeqD: l</td>
<td>FeqJ</td>
</tr>
<tr>
<td>FeqE: i u</td>
<td>FeqA</td>
</tr>
<tr>
<td>FeqF: k ġ s</td>
<td>Feqs D + O + Q</td>
</tr>
<tr>
<td>FeqG: p t ź r ŕ</td>
<td>Feqs B + C + N + P + R</td>
</tr>
</tbody>
</table>

In general, the introduction of 'marginal' elements leads to an increase in the number of Feqs, both by virtue of the new classes

¹ See p126-133.
required to account for the 'marginal' elements, and of the 'break-
down' of the existing classes into further classes. When the
marginal elements are incorporated, there is a high degree of
fragmentation in the system.

In spite of the striking appearance of the fragmentation, there
does not appear to me to be any means by which we might demonstrate
in a synchronic way the marginality of those elements which bring
about the fragmentation. In order to demonstrate a conclusion C,
we have to show that C is a logical consequence of some initial
conditions in either the theory and the description. There are no
such conditions in the present theory or description, as far as
the author knows. The only way which comes to mind assumes a
universal number of paradigmatic classes, which set of paradigmatic
classes would serve as a 'norm' by which we could gauge 'normality'
or 'marginality'. There is no reason why a language should not have
twenty-three Freqs such as System B here. Unless one imposes an
arbitrary universal standard number of such classes, there is no
way by which one can state that twenty-three is too many. Such a
principle, of course, would run counter to the very nature of
functionalism. One of the major points which I made in discussing
Jakobson's distinctive features ¹ was that, contrary to the universal
features of that linguist, functionalism treats linguistic units
as peculiar to a given language, and not as universal.

¹ See p33.
In the face of these difficulties, one has little alternative but to regard 'marginality' as an intuitive criterion. Nothing approximating to universals figures in the present methodology.
THE PHONEMES OF SYSTEM B AND THEIR REALISATIONS

1. Preliminary.

The presentation of this chapter is strictly analogous to that of LX.

The phonetic realisations of those elements which figure in System A are not repeated here, but reference is made to the pages of the thesis where they may be found.

For the following, it is important to note that an item in the archiposition 'E' may commute with either an item in 'el' or an item in 'e2'. The archiposition 'E' stands for those positions.

For quick reference, I list all the possible commutations for phonemes, even where there is not an attested pair for given commutations. This enables one to spot the commutative possibilities of each phoneme very much more easily, and to compare the coms of any two phonemes in the system without much difficulty.

2. The phoneme /b/.

/b/ operates in 'el' and 'E'. It is a feature of System B that in those elements where both 'explosive' positions are filled, no item in either of the two positions is ever opposed to another phoneme. For instance, in /broka/, neither /b/ nor /r/ is opposed to any other phoneme. Of course, in a form where either of the

1 Throughout this section, '−' denotes 'syllabic boundary'.
'explosive' positions is filled by 'zero', the item in the other 'explosive' position commutes with items in the archiposition 'E'. There are many commutations of this kind. However, there are no Spars for items in the explosive positions 'el' and 'e2', where both are filled. This is another intuitive reason for believing that the distributional unit of four positions does not give a completely 'true' reflection of the data as a whole. The four-position unit is made necessary by a very small set of forms. The position classes 'el' and 'e2', however, are unproductive.¹

| b/d  |       |
| b/g  | /SiNba/ "cross river" /SiNga/ "disappear" |
| b/f  |       |
| b/x  |       |
| b/l  |       |
| b/p  | /ba-ka/ "cow" /pa-ka/ "hide" |
| b/t  | /ba-ka/ "cow" /ta-ka/ "sprain" |
| b/k  | /ba-ra/ "rod" /ka-ra/ "skin" |
| b/m  | /ba-ka/ "cow" /ma-ka/ "fight" |
| b/n  |       |
| b/ŋ  | /ba-ka/ "cow" /ŋa-ka/ "bewitch" |
| b/Z  |       |

¹This intuitive criterion means roughly that, although by occurring in a pos with other items an entity has a certain commutative potential, this potential is not converted into Spars which enable us to calculate paradigmatic function(s).
The phoneme /b/ is realised voiced bilabial occlusive [b].

3. The phoneme /d/.

/d/ occurs in 'el' or 'E'. In 'E', it commutes with /p t ŋ ŋ.

<table>
<thead>
<tr>
<th>phoneme</th>
<th>phonetic symbol</th>
<th>pronunciation</th>
<th>example</th>
</tr>
</thead>
<tbody>
<tr>
<td>d/b</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>d/g</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d/f</td>
<td></td>
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<td>d/x</td>
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<tr>
<td>d/l</td>
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<tr>
<td>d/p</td>
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<tr>
<td>d/t</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>d/k</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d/m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d/n</td>
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<td></td>
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</table>

The phoneme /d/ is realised as /d/.
<table>
<thead>
<tr>
<th>d/ünchen</th>
<th>/da-ńō/ &quot;harm&quot;</th>
<th>/ńa-ńō/ &quot;thin&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>d/žen</td>
<td>/ka-đa/ &quot;each&quot;</td>
<td>/ka-ża/ &quot;begin&quot;</td>
</tr>
<tr>
<td>d/ćen</td>
<td>/ka-đa/ &quot;each&quot;</td>
<td>/ka-ća/ &quot;send&quot;</td>
</tr>
<tr>
<td>d/ren</td>
<td>/ka-đa/ &quot;each&quot;</td>
<td>/ka-ra/ &quot;skin&quot;</td>
</tr>
<tr>
<td>d/sen</td>
<td>/mo-đo/ &quot;way&quot;</td>
<td>/mo-so/ &quot;merchant&quot;</td>
</tr>
<tr>
<td>d/šen</td>
<td>/ka-đa/ &quot;each&quot;</td>
<td>/ka-ša/ &quot;I will be&quot;</td>
</tr>
<tr>
<td>d/len</td>
<td>/ka-đa/ &quot;each&quot;</td>
<td>/ka-ia/ &quot;call&quot;</td>
</tr>
<tr>
<td>d/uen</td>
<td>/ka-đa/ &quot;each&quot;</td>
<td>/ka-ua/ &quot;see&quot;</td>
</tr>
<tr>
<td>d/0en</td>
<td>-------</td>
<td>-------</td>
</tr>
</tbody>
</table>

d/a e o N B D G – precluded by distribution

The phoneme /d/ is realised voiced apico-dental occlusive [d].

4. The phoneme /g/.

/g/ operates in 'el' and 'E'. In 'E', it commutes with /b p t k m n ź ł r s ś i u 0/.

| g/b | /ćiN-ga/ "disappear" | /ćiN-ba/ "cross river" |
| g/d | ------- | ------- |
| g/f | ------- | ------- |
| g/x | ------- | ------- |
| g/l | ------- | ------- |
| g/p | /kaN-ga/ "and you" | /kaN-pa/ "of you" |
| g/t | /kaN-ga/ "and you" | /kaN-ta/ "you(O)" |
| g/k | /pa-ga-ra/ "pay now" | /pa-ka-ra/ "hide now" |
The phoneme /g/ is realised voiced dorsal occlusive [g].

5. The phoneme /f/.

/f/ operates in 'el' and 'E'. In 'E', it commutes with /p k 0/.

The phoneme /g/ is realised voiced dorsal occlusive [g].

5. The phoneme /f/.

/f/ operates in 'el' and 'E'. In 'E', it commutes with /p k 0/.
The phoneme /f/ is realised unvoiced labio-dental fricative [f].

6. The phoneme /x/.

/x/ operates in 'E' only, where it commutes with /n/.

The phoneme /x/ operates in 'E' only, where it commutes with /n/.
The phoneme /x/ is realised unvoiced velar fricative [x].

7. The phoneme /l/. 

/l/ operates in 'e2', 'E' and 'i'. In 'E', it commutes with /p k m n ŋ c r s š/.

l/b --------
l/d --------
l/g --------
l/f --------
l/x --------
| 1/p | 1/ma-la/ "bad" | 1/ma-pa/ "green liquid" |
| 1/t | ------- | ------- |
| 1/k | 1/la-ia/ "class" | 1/ka-ia/ "tomorrow" |
| 1/m | 1/ma-la/ "bad" | 1/ma-ma/ "mother" |
| 1/n | 1/ma-la/ "bad" | 1/ma-na/ "no" |
| 1/ŋ | 1/ma-la/ "bad" | 1/ma-ŋa/ "request" |
| 1/Z | ------- | ------- |
| 1/ɛ | 1/la-ia/ "class" | 1/ɛa-ia/ "arrive" |
| 1/r | 1/ki-1u/ "kilo" | 1/ki-ru/ "tooth" |
| 1/s | 1/ma-la/ "bad" | 1/ma-sa/ "dry in sun" |
| 1/ɔ | 1/la-ia/ "class" | 1/ɔa-ia/ "stand" |
| 1/i | ------- | ------- |
| 1/u | ------- | ------- |
| l/N | ------- | ------- |
| l/B | ------- | ------- |
| l/D | ------- | ------- |
| l/G | ------- | ------- |
| l/O | ------- | ------- |

1/a e o - precluded by distribution

The phoneme /l/ is realised apico-alveolar lateral [l].

8. The phoneme /p/.

/p/ operates in 'el' and 'E'. In 'E', it commutes with /b d g
The phoneme /p/ is realised voiced bilabial occlusive [b] after a nasal. This realisation is in free variance with unvoiced bilabial
occlusive [p] as a realisation of /p/ after nasal.  

9. The phoneme /t/.

/t/ operates in 'el' and 'E'. In 'E', it commutes with /b d g p k m n ŋ ź ě r s ŝ i u/

<table>
<thead>
<tr>
<th>Sound</th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>/t/</td>
<td>/ta-ka/ &quot;sprain&quot;</td>
<td>/ba-ka/ &quot;cow&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ti-ia/ &quot;be&quot;</td>
<td>/di-ia/ &quot;day&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/kaN-ta/ &quot;you(0)&quot;</td>
<td>/kaN-ga/ &quot;and you&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>/t/</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>/t/</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>/t/</td>
<td>/ta-ka/ &quot;father&quot;</td>
<td>/pa-pa/ &quot;potato&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ta-ka/ &quot;father&quot;</td>
<td>/ta-ka/ &quot;sprain&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ta-ka/ &quot;sprain&quot;</td>
<td>/ma-ka/ &quot;fight&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ta-ka/ &quot;father&quot;</td>
<td>/na-na/ &quot;pain&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ta-ka/ &quot;sprain&quot;</td>
<td>/ña-ka/ &quot;bewitch&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/pa-ta/ &quot;perhaps&quot;</td>
<td>/pa-ža/ &quot;pick(fruit)&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ta-ka/ &quot;sprain&quot;</td>
<td>/ča-ka/ &quot;bridge&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/pi-ta/ &quot;whom?&quot;</td>
<td>/pi-ra/ &quot;who then?&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ti-pi/ &quot;cut&quot;</td>
<td>/si-pi/ &quot;put under water&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ua-ta/ &quot;year&quot;</td>
<td>/ua-ša/ &quot;behind&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ta-ka/ &quot;sprain&quot;</td>
<td>/ia-ka/ &quot;almost&quot;</td>
</tr>
<tr>
<td>/t/</td>
<td>/ta-ka/ &quot;sprain&quot;</td>
<td>/ua-ka/ &quot;cry&quot;</td>
</tr>
</tbody>
</table>

1See also p144.
The phoneme /t/ is realised voiced apico-dental occlusive [d] after a nasal, which realisation is in free variance with unvoiced apico-dental occlusive [t] in that position.¹

10. The phoneme /k/.

/k/ operates in 'el' and 'E'. In 'E', it commutes with /b ə f /

<table>
<thead>
<tr>
<th>/k/</th>
<th>/ka-ra/ &quot;skin&quot;</th>
<th>/ba-ra/ &quot;rod&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>/k/b</td>
<td>/ka-ra/ &quot;skin&quot;</td>
<td>/ba-ra/ &quot;rod&quot;</td>
</tr>
<tr>
<td>/k/d</td>
<td>/pa-ka-ra/ &quot;hide yet&quot;</td>
<td>/pa-ga-ra/ &quot;pay&quot;</td>
</tr>
<tr>
<td>/k/g</td>
<td>/ki-lo/ &quot;kilo&quot;</td>
<td>/fi-lo/ &quot;hill&quot;</td>
</tr>
<tr>
<td>/k/f</td>
<td>/ki-lo/ &quot;kilo&quot;</td>
<td>/fi-lo/ &quot;hill&quot;</td>
</tr>
<tr>
<td>/k/x</td>
<td>/ka-ia/ &quot;tomorrow&quot;</td>
<td>/la-ia/ &quot;class&quot;</td>
</tr>
<tr>
<td>/k/l</td>
<td>/ka-ia/ &quot;tomorrow&quot;</td>
<td>/la-ia/ &quot;class&quot;</td>
</tr>
<tr>
<td>/k/p</td>
<td>/ka-i/ &quot;this&quot;</td>
<td>/pa-i/ &quot;he, she&quot;</td>
</tr>
<tr>
<td>/k/t</td>
<td>/ta-ka/ &quot;sprain&quot;</td>
<td>/ta-ta/ &quot;father&quot;</td>
</tr>
<tr>
<td>/k/m</td>
<td>/ma-ka/ &quot;fight&quot;</td>
<td>/ma-na/ &quot;no&quot;</td>
</tr>
<tr>
<td>/k/n</td>
<td>/ma-ka/ &quot;fight&quot;</td>
<td>/ma-na/ &quot;no&quot;</td>
</tr>
<tr>
<td>/k/ŋ</td>
<td>/kaN/ &quot;you&quot;</td>
<td>/naN/ &quot;path&quot;</td>
</tr>
<tr>
<td>/k/ž</td>
<td>/pa-ka/ &quot;hide&quot;</td>
<td>/pa-ža/ &quot;pick(fruit)&quot;</td>
</tr>
<tr>
<td>/k/č</td>
<td>/kai/ &quot;this&quot;</td>
<td>/čai/ &quot;that&quot;</td>
</tr>
<tr>
<td>/k/ř</td>
<td>/si-ki/ &quot;bottom&quot;</td>
<td>/si-ri/ &quot;rest&quot;</td>
</tr>
<tr>
<td>/k/s</td>
<td>/pa-ka/ &quot;hide&quot;</td>
<td>/pa-sa/ &quot;pass&quot;</td>
</tr>
</tbody>
</table>

¹See also pl45.
k/š /ka-ia/ "call" /ša-ia/ "stand"
k/i /ča-ka/ "bridge" /ča-ia/ "arrive"
k/u /pa-ka/ "hide" /pa-ua/ "fly"
k/ø /ka-pa/ "shout" /a-pa/ "carry"
k/a e o N B D G - precluded

The phoneme /k/ is realised unvoiced velar occlusive.

11. The phoneme /m/.

/m/ operates in 'E' only, where it commutes with /b e g: l p t k n ŋ ž č r s š i u ø/.

m/b /ma-ka/ "fight" /ba-ka/ "cow"
m/d --------
m/g /ma-na/ "no" /ga-na/ "win"
m/f --------
m/x --------
m/l /ma-ma/ "mother" /ma-la/ "bad"
m/p /mai/ "where?" /pai/ "he, she"
m/t /ma-ma/ "mother" /ta-ta/ "father"
m/k /mai/ "where?" /kai/ "this"
m/n /ma-ma/ "mother" /na-na/ "pain"
m/ŋ /ma-ma/ "mother" /ŋa-ŋa/ "sister"
m/ž /ma-ki/ "hand" /ža-ki/ "sadness"
m/č /ma-ki/ "hand" /ča-ki/ "foot"
m/r /sa-ma/ "rest" /sa-ra/ "maize"
244.

m/s /ma-ma/ "mother" /ma-sa/ "dry in sun"

m/ə /pai-mi/ "he, indeed" /pai-əi/ "he, they say"

m/i /ma-ka/ "fight" /ia-ka/ "almost"

m/u /ma-ka/ "fight" /ua-ka/ "cry"

m/ɔ /ma-ma/ "mother" /a-ma/ "don't!"

For the realisation of /m/, see pl47.

12. The phoneme /n/.

/n/ operates in 'E' only, where it commutes with /g x 1 p

| n/b  | ------ |
| n/d  | ------ |
| n/g  | /na-na/ "hurt" /ga-na/ "win"
| n/f  | ------ |
| n/x  | /ke-na/ "flute" /ke-xa/ "complain"
| n/l  | /ma-na/ "no" /ma-la/ "bad"
| n/p  | /na-na/ "hurt" /pa-pa/ "potato"
| n/t  | /na-na/ "hurt" /ta-ta/ "father"
| n/k  | /ma-na/ "no" /ma-ka/ "fight"
| n/m  | /na-na/ "pain" /ma-ma/ "mother"
| n/ŋ  | /na-na/ "pain" /ŋa-ŋa/ "sister"
| n/ʒ  | /pai-na/ "he now" /pai-ʒa/ "only he"

The element "/nana/" occurs in verbal words, where it is best translated "hurt"; and in nominal words, where it is best translated "pain". Hence, some references to "hurt", and others to "pain".
| n/ə | /u-na/ "early morning" | /u-צה/ "blame" |
| n/r | /u-na/ "early morning" | /u-ra/ "below" |
| n/s | /niN-צ/i "we tell" | /siN-צ/i "strong" |
| n/ё | /ni-na/ "flame" | /צ/i-나/ "like" |
| n/i | /na-na/ "pain" | /ia-na/ "black" |
| n/u | /na-na/ "pain" | /ua-ua/ "baby" |
| n/o | /ni-ma/ "nothing" | /i-ma/ "what?" |

For the realisation of /n/, see pl48.

13. The phoneme /n/.

/n/ operates in 'E' only, where it commutes with /b d l
p t k m n צ ז ר s ש i u o/.

| /n/ | /Ha-ka/ "bewitch" | /ba-ka/ "cow" |
| /n/ | /Ha-ם/ "thin" | /da-ם/ "harm" |
| /n/ | ------- | ------- |
| /n/ | ------- | ------- |
| /n/ | /ma-נה/ "request" | /ma-la/ "bad" |
| /n/ | /Ha-נה/ "sister" | /pa-pa/ "potato" |
| /n/ | /Ha-נה/ "sister" | /ta-ta/ "father" |
| /n/ | /HaN/ "path" | /קאN/ "you" |
| /n/ | /Ha-נה/ "sister" | /ma-ma/ "mother" |
| /n/ | /Ha-נה/ "sister" | /na-na/ "pain" |
| /n/ | /ה-ה-ה/ "I" | /צוע-ה/ "climb" |
| ñ/ə | /ña-ka/ "bewitch" | /ća-ka/ "bridge" |
| ñ/r | /pu-ñu/ "sleep" | /pu-ru/ "absolutely" |
| ñ/s | /ma-ña/ "request" | /ma-sa/ "dry in sun" |
| ñ/ŋ | /ñuk-ñu/ "sugar" | /ñuk-ñu/ "spindle" |
| ñ/i | /ña-ka/ "bewitch" | /ia-ka/ "almost" |
| ñ/u | /ña-ka/ "bewitch" | /ua-ka/ "cry" |
| ñ/o | /ña-ña/ "sister" | /a-ña/ "bark" |

ñ/a e o N B D G - precluded by distribution

For the realisations of ñ/, see pl 49-50.

14. The phoneme /ź/: /ź/ operates in 'E' and 'i'. In 'E', it commutes with /d g p t k m n ć s r ʃ i u/. In 'i', it commutes with /N D O/ as well.

<p>| ź/b | ---- | |
| ź/d | /ka-źa/ &quot;begin&quot; | /ka-źa/ &quot;each&quot; |
| ź/g | /pa-źa-ra/ &quot;pick now&quot; | /pa-ga-ra/ &quot;pay&quot; |
| ź/f | ---- | |
| ź/x | ---- | |
| ź/l | ---- | |
| ź/p | /źa-ki/ &quot;sadness&quot; | /pa-ki/ &quot;break&quot; |
| ź/t | /pai-źa/ &quot;only he&quot; | /pai-ta/ &quot;him&quot; |
| ź/k | /źu-ka/ &quot;climb&quot; | /pu-ka/ &quot;red&quot; |</p>
<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Pronunciation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ž/</td>
<td>/ža-ki/</td>
<td>&quot;grief&quot;</td>
</tr>
<tr>
<td></td>
<td>/ma-ki/</td>
<td>&quot;hand&quot;</td>
</tr>
<tr>
<td>/s/</td>
<td>/pa-ža/</td>
<td>&quot;only he&quot;</td>
</tr>
<tr>
<td></td>
<td>/pa-i-na/</td>
<td>&quot;he now&quot;</td>
</tr>
<tr>
<td>/ʒ/</td>
<td>/žu-ka/</td>
<td>&quot;climb&quot;</td>
</tr>
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<td>/nu-ka/</td>
<td>&quot;I&quot;</td>
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<td>/Č/</td>
<td>/ža-ki/</td>
<td>&quot;grief&quot;</td>
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<tr>
<td></td>
<td>/ca-ki/</td>
<td>&quot;foot&quot;</td>
</tr>
<tr>
<td>/r/</td>
<td>/ki-žu/</td>
<td>&quot;yellow&quot;</td>
</tr>
<tr>
<td></td>
<td>/ki-ru/</td>
<td>&quot;tooth&quot;</td>
</tr>
<tr>
<td>/ř/</td>
<td>/pa-ža/</td>
<td>&quot;pick(fruit)&quot;</td>
</tr>
<tr>
<td></td>
<td>/pa-sa/</td>
<td>&quot;pass&quot;</td>
</tr>
<tr>
<td>/š/</td>
<td>/ka-žu/</td>
<td>&quot;tongue&quot;</td>
</tr>
<tr>
<td></td>
<td>/ka-šu/</td>
<td>&quot;fruit variety&quot;</td>
</tr>
<tr>
<td>/i/</td>
<td>/ka-ža/</td>
<td>&quot;begin&quot;</td>
</tr>
<tr>
<td></td>
<td>/ka-ia/</td>
<td>&quot;call&quot;</td>
</tr>
<tr>
<td>/u/</td>
<td>/ka-ža/</td>
<td>&quot;begin&quot;</td>
</tr>
<tr>
<td></td>
<td>/ka-ua/</td>
<td>&quot;see&quot;</td>
</tr>
<tr>
<td>/N/</td>
<td>/kaž-pa/</td>
<td>&quot;run&quot;</td>
</tr>
<tr>
<td></td>
<td>/kaN-pa/</td>
<td>&quot;for you&quot;</td>
</tr>
<tr>
<td>/B/</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td>/D/</td>
<td>/už-ku/</td>
<td>&quot;man&quot;</td>
</tr>
<tr>
<td></td>
<td>/uD-ku/</td>
<td>&quot;cotton&quot;</td>
</tr>
<tr>
<td>/G/</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
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<td>/už-ku/</td>
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<tr>
<td></td>
<td>/u-ku/</td>
<td>&quot;the inside&quot;</td>
</tr>
</tbody>
</table>

**Z/a e o** - precluded by distribution

For the realisations of /ž/, see p152.

15. The phoneme /Č/.

/Č/ operates in 'E' and 'I'. In 'E', it commutes with /b d g l p t k m n ŋ ţ ř s š į u/. In 'I', it commutes with /D 0/ as well.

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Pronunciation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ž/</td>
<td>/ča-ka/</td>
<td>&quot;bridge&quot;</td>
</tr>
<tr>
<td></td>
<td>/ba-ka/</td>
<td>&quot;cow&quot;</td>
</tr>
<tr>
<td>/ʒ/</td>
<td>/ka-ča/</td>
<td>&quot;send&quot;</td>
</tr>
<tr>
<td></td>
<td>/ka-da/</td>
<td>&quot;each&quot;</td>
</tr>
<tr>
<td>/Č/</td>
<td>/kaN-či/</td>
<td>&quot;we are&quot;</td>
</tr>
<tr>
<td></td>
<td>/kaN-gi/</td>
<td>&quot;you are&quot;</td>
</tr>
</tbody>
</table>
For the realisation of /ɛ/, see p153.
16. The phoneme /r/.

/r/ operates in 'el', 'e2', 'E' and 'i'. In 'E', it commutes with /d g l p t k m n ŋ ź ē s ř i u/. In 'i', it commutes with /D O/.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Example</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>/r/b</td>
<td>/ka-ra/ &quot;skin&quot;</td>
<td>/ka-da/ &quot;each&quot;</td>
</tr>
<tr>
<td>/r/d</td>
<td>/ka-ra/ &quot;now you&quot;</td>
<td>/kaN-ga/ &quot;and you&quot;</td>
</tr>
<tr>
<td>/r/g</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>/r/f</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>/r/x</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>/r/l</td>
<td>/ki-ru/ &quot;tooth&quot;</td>
<td>/ki-lu/ &quot;kilo&quot;</td>
</tr>
<tr>
<td>/r/p</td>
<td>/ka-ra/ &quot;feed(animal)&quot;</td>
<td>/ka-pa/ &quot;shout&quot;</td>
</tr>
<tr>
<td>/r/t</td>
<td>/pi-ra/ &quot;who then?&quot;</td>
<td>/pi-ta/ &quot;whom?&quot;</td>
</tr>
<tr>
<td>/r/k</td>
<td>/siri/ &quot;lie down&quot;</td>
<td>/si-ki/ &quot;bottom&quot;</td>
</tr>
<tr>
<td>/r/m</td>
<td>/u-ra/ &quot;below&quot;</td>
<td>/u-ma/ &quot;head&quot;</td>
</tr>
<tr>
<td>/r/n</td>
<td>/u-ra/ &quot;below&quot;</td>
<td>/u-na/ &quot;early morning&quot;</td>
</tr>
<tr>
<td>/r/ŋ</td>
<td>/pu-ru/ &quot;absolutely&quot;</td>
<td>/pu-ŋu/ &quot;sleep&quot;</td>
</tr>
<tr>
<td>/r/ʒ</td>
<td>/ki-ru/ &quot;tooth&quot;</td>
<td>/ki-ʒu/ &quot;yellow&quot;</td>
</tr>
<tr>
<td>/r/ʒ</td>
<td>/sa-ra/ &quot;maize&quot;</td>
<td>/sa-ʒa/ &quot;woods&quot;</td>
</tr>
<tr>
<td>/r/s</td>
<td>/ru-pai/ &quot;burning&quot;</td>
<td>/su-pai/ &quot;demon&quot;</td>
</tr>
<tr>
<td>/r/ʃ</td>
<td>/ka-ru/ &quot;the distance&quot;</td>
<td>/ka-ʃu/ &quot;fruit variety&quot;</td>
</tr>
<tr>
<td>/r/i</td>
<td>/ka-ra/ &quot;feed(animal)&quot;</td>
<td>/ka-ia/ &quot;call&quot;</td>
</tr>
<tr>
<td>/r/u</td>
<td>/ka-ra/ &quot;feed(animal)&quot;</td>
<td>/ka-ua/ &quot;see&quot;</td>
</tr>
</tbody>
</table>

\[1\] Note that "kilo" has the synonymous forms "/kilo/" and "/kilu/", the representation /kilɔ/ being used throughout merely for brevity.
For the realisation of /r/, see §154.

17. The phoneme /s/.

/s/ operates in 'el, 'E' and 'i'. In 'E', it commutes with /b d g l p t k m n ŋ ž č r s i u o/. In 'i', it commutes with /N/.

- /s/b /sa-ra/ "maize" /ba-ra/ "rod"
- /s/d /mo-so/ "merchant" /mo-do/ "way"
- /s/g /pa-sa-ra/ "pass now" /pa-ga-ra/ "pay"
- /s/f ------
- /s/x ------
- /s/l /ma-sa/ "dry in sun" /ma-la/ "bad"
- /s/p /sa-ki/ "leave" /pa-ki/ "break"
- /s/t /si-pi/ "put under water" /ti-pi/ "cut"
- /s/k /pa-sa/ "pass" /pa-ka/ "hide"
- /s/m /sa-ma/ "rest" /ma-ma/ "mother"
- /s/n /siN-či/ "strong" /niN-či/ "we tell"
- /s/ŋ /ma-sa/ "dry in sun" /ma-ŋa/ "request"
s/ɑ /sa-ki/ "leave" /ža-ki/ "grief"
s/ɔ /sá-ki/ "leave" /ča-ki/ "foot"
s/ɾ /su-pai/ "devil" /ru-pai/ "burn"
s/ɛ /ma-su/ "pestle stick" /ma-šu/ "bat"
s/i /sa-ča/ "woods" /ia-ča/ "know"
s/u /sa-si-ku/ "diet" /ua-si-ku/ "make house"
s/N /kas-pi/ "tree" /kaN-pi/ "in you"
s/B -----------
s/D -----------
s/G -----------
s/O /sa-ma/ "rest" /a-ma/ "don't"

s/a e o - precluded by distribution

For the realisation of /s/, see p155.

18. The phoneme /s/.

/s/ operates in 'E' and 'i'. In 'E', it commutes with /d g l p t k m n ŋ z ž r s i u o/. In 'i', it commutes with /N/.

/s/ b -----------
/s/ d /ka-ža/ "I will be" /ka-da/ "each"
/s/ g /kaN-ši/ "you, they say" /kaN-gi/ "you are"
/s/ f -----------
/s/ x -----------
/s/ l /ša-ia/ "stand" /la-ia/ "class"
/s/ p /šuN-gu/ "heart" /puN-gu/ "door"
\[\text{\(\tilde{a}/t\)} /\text{ua-\(\tilde{a}\)/} "behind" /\text{ua-ta/} "year"
\]
\[\text{\(\tilde{a}/k\)} /\text{\(\tilde{u}\)-ia/} "wait" /\text{ku-ia/} "love"
\]
\[\text{\(\tilde{a}/m\)} /\text{pai-\(\tilde{i}\)/} "he, they say" /\text{pai-mi/} "he, indeed"
\]
\[\text{\(\tilde{a}/n\)} /\text{\(\tilde{i}\)-na/} "like" /\text{ni-na/} "flame"
\]
\[\text{\(\tilde{a}/\tilde{n}\)} /\text{\(\tilde{\tilde{\tilde{u}}\)-su/} "spindle" /\text{\(\tilde{\tilde{\tilde{u}}\)-nu/} "sugar"
\]
\[\text{\(\tilde{a}/\tilde{\tilde{\tilde{u}}}\)} /\text{ka-\(\tilde{\tilde{\tilde{u}}\)/} "fruit type" /\text{ka-\(\tilde{\tilde{\tilde{u}}\)/} "tongue"
\]
\[\text{\(\tilde{a}/\tilde{\tilde{\tilde{u}}\)} /\text{\(\tilde{\tilde{\tilde{u}}\)-ia/} "stand" /\text{\(\tilde{\tilde{\tilde{u}}\)-ia/} "arrive"
\]
\[\text{\(\tilde{a}/r\)} /\text{ka-\(\tilde{\tilde{\tilde{u}}\)/} "fruit type" /\text{ka-ru/} "the distance"
\]
\[\text{\(\tilde{a}/s\)} /\text{ma-\(\tilde{\tilde{\tilde{u}}\)/} "bat" /\text{ma-su/} "pestle-stick"
\]
\[\text{\(\tilde{a}/i\)} /\text{\(\tilde{\tilde{\tilde{u}}\)-ia/} "wait" /\text{iu-ia/} "think"
\]
\[\text{\(\tilde{a}/u\)} /\text{ua-\(\tilde{\tilde{\tilde{u}}\)/} "behind" /\text{ua-ua/} "baby"
\]
\[\text{\(\tilde{a}/\tilde{\tilde{\tilde{u}}\)} /\text{ka\(\tilde{\tilde{\tilde{u}}}\)-na/} "thus" /\text{ka\(\tilde{\tilde{\tilde{u}}}\)-na/} "now you"
\]
\[\text{\(\tilde{a}/b\)} --------
\]
\[\text{\(\tilde{a}/d\)} --------
\]
\[\text{\(\tilde{a}/g\)} --------
\]
\[\text{\(\tilde{a}/o\)} /\text{\(\tilde{\tilde{\tilde{u}}}\)-n-gu/} "heart" /\text{\(\tilde{\tilde{\tilde{u}}}\)-n-gu/} "illness"
\]
\[\text{\(\tilde{a}/a e o\)} – precluded by distribution
\]

For the realisation of /\(\tilde{a}/\), see pl56.

19. The phoneme /i/.

\(\text{/i/ operates in 'e2', 'E', 'n' and 'i'}. In 'E', it commutes with /b d g p t k m n \tilde{a} \tilde{\tilde{\tilde{u}}} \tilde{\tilde{\tilde{u}}} \tilde{\tilde{\tilde{u}}} s \tilde{\tilde{\tilde{u}}} o/\). In 'n', it commutes with /a e o u/. In 'i', it commutes with /\text{N G}/.\text{1}

\text{\textsuperscript{1}}Recall that for \text{coms} we need attest only one commutation of /i/ with another phoneme. Hence, the omission of /i/ \(\sim /u/\) in 'E'.

<table>
<thead>
<tr>
<th>i/b</th>
<th>/ia-ka/ &quot;almost&quot;</th>
<th>/ba-ka/ &quot;cow&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>i/d</td>
<td>/ka-ia/ &quot;tomorrow&quot;</td>
<td>/ka-da/ &quot;each&quot;</td>
</tr>
<tr>
<td>i/g</td>
<td>/ia-na/ &quot;black&quot;</td>
<td>/ga-na/ &quot;win&quot;</td>
</tr>
<tr>
<td>i/f</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>i/x</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>i/1</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>i/p</td>
<td>/ka-ia/ &quot;call&quot;</td>
<td>/ka-pa/ &quot;shout&quot;</td>
</tr>
<tr>
<td>i/t</td>
<td>/ia-ka/ &quot;almost&quot;</td>
<td>/ta-ka/ &quot;sprain&quot;</td>
</tr>
<tr>
<td>i/k</td>
<td>/iu-ia/ &quot;think&quot;</td>
<td>/ku-ia/ &quot;love&quot;</td>
</tr>
<tr>
<td>i/m</td>
<td>/u-ia/ &quot;face&quot;</td>
<td>/u-ma/ &quot;head&quot;</td>
</tr>
<tr>
<td>i/n</td>
<td>/u-ia/ &quot;face&quot;</td>
<td>/u-na/ &quot;early morning&quot;</td>
</tr>
<tr>
<td>i/ǹ</td>
<td>/ia-ka/ &quot;almost&quot;</td>
<td>/ǹa-ka/ &quot;bewitch&quot;</td>
</tr>
<tr>
<td>i/ž</td>
<td>/ka-ia/ &quot;call&quot;</td>
<td>/ka-ža/ &quot;begin&quot;</td>
</tr>
<tr>
<td>i/ɕ</td>
<td>/ka-ia/ &quot;call&quot;</td>
<td>/ɕa-ia/ &quot;arrive&quot;</td>
</tr>
<tr>
<td>i/r</td>
<td>/ka-ia/ &quot;call&quot;</td>
<td>/ka-ra/ &quot;feed(animal)&quot;</td>
</tr>
<tr>
<td>i/s</td>
<td>/ia-ča/ &quot;know&quot;</td>
<td>/sa-ča/ &quot;woods&quot;</td>
</tr>
<tr>
<td>i/š</td>
<td>/iu-ia/ &quot;think&quot;</td>
<td>/šu-ia/ &quot;wait&quot;</td>
</tr>
<tr>
<td>i/a</td>
<td>/ki-ru/ &quot;tooth&quot;</td>
<td>/ka-ru/ &quot;the distance&quot;</td>
</tr>
<tr>
<td>i/e</td>
<td>/ki-na/ &quot;fruit type&quot;</td>
<td>/ke-na/ &quot;flute&quot;</td>
</tr>
<tr>
<td>i/o</td>
<td>/či-ri/ &quot;cold&quot;</td>
<td>/čo-ro/ &quot;monkey&quot;</td>
</tr>
<tr>
<td>i/u</td>
<td>/ki-ru/ &quot;tooth&quot;</td>
<td>/ku-ru/ &quot;worm&quot;</td>
</tr>
<tr>
<td>i/N</td>
<td>/kai/ &quot;living&quot;</td>
<td>/kaN/ &quot;you&quot;</td>
</tr>
<tr>
<td>i/B</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>i/D</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>i/G</td>
<td>/kau-sai/ &quot;living&quot;</td>
<td>/kau-saG/ &quot;one who lives&quot;</td>
</tr>
</tbody>
</table>
254.

1/0 /kai-pa/ "for this"  /ka-pa/ "shout"

For the realisations of /i/, see pl38.

20. The phoneme /u/.

/u/ operates in 'e2', 'E', 'n' and 'i'. In 'E', it commutes with /b d g p t k m n ŋ ź č r s ş 0/. In 'n', it commutes with /a e i o/, and in 'i', it commutes with /N/.

| /u/b | /ua-ka/ "cry" | /ba-ka/ "cow" |
| /u/d | /ka-ua/ "see" | /ka-da/ "each" |
| /u/g | /pa-ua-ra/ "fly now" | /pa-ga-ra/ "pay" |
| /u/f | | |
| /u/x | | |
| /u/l | | |
| /u/p | /ua-ka/ "cry" | /pa-ka/ "hide" |
| /u/t | /ua-ka/ "cry" | /ta-ka/ "sprain" |
| /u/k | /pa-ua/ "fly" | /ka-ua/ "see" |
| /u/m | /sa-ua/ "the top" | /sa-ma/ "rest" |
| /u/n | /ua-ua/ "baby" | /na-na/ "pain" |
| /u/ŋ | /ua-ua/ "baby" | /ña-ña/ "sister" |
| /u/ž | /pa-ua/ "fly" | /pa-ža/ "pick(fruit)" |
| /u/č | /ua-ka/ "cry" | /ča-ka/ "bridge" |
| /u/r | /sa-ua/ "the top" | /sa-ra/ "maize" |
| /u/s | /pa-ua/ "fly" | /pa-sa/ "pass" |
| /u/š | /ua-ua/ "baby" | /ua-ša/ "behind" |
| /u/i | /ku-ru/ "worm" | /ki-ru/ "tooth" |
u/a  /ku-ru/ "worm"    /ka-ru/ "the distance"
u/e  /ku-naN/ "now"    /ke-naN/ "his flute"
u/o  /ču-ru/ "snail"    /čo-ro/ "monkey type"
u/N  /ňau-pa/ "beginning"    /ňaN-pa/ "of the path"
u/B  ------
u/D  ------
u/G  ------
u/O  /ua-ua/ "baby"    /a-ua/ "weave"

For the realisations of /u/, see pl40.

21. The phoneme /a/.

/a/ operates in 'n' only, where it commutes with /e o i u/.

a/e  /sa-ra/ "maize"    /se-ra/ "liquid"
a/o  /ma-sa/ "dry in sun"    /mo-so/ "merchant"
a/i  /ka-žu/ "tongue"    /ki-žu/ "yellow"
a/u  /ka-ru/ "the distance"    /ku-ru/ "worm"

For the realisations of /a/, see pl37.

22. The phoneme /e/.

/e/ operates in 'n' only, where it commutes with /a o i u/.

e/a  /se-ra/ "liquid"    /sa-ra/ "maize"
e/o  /me-de/ "measure"    /mo-do/ "way"
e/i  /ke-na/ "flute"    /ki-na/ "fruit type"
e/u  /ke-naN/ "his flute"    /ku-naN/ "now"

/e/ is realised front, half-close, spread [e].
23. The phoneme /o/.

/o/ operates in 'n' only, where it commutes with /a e i u/.

- o/a /mo-so/ "merchant" /ma-sa/ "dry in sun"
- o/e /mo-do/ "way" /me-de/ "measure"
- o/i / scholars-ro/ "monkey" /ši-ri/ "cold"
- o/u / scholars-ro/ "monkey" /šu-ru/ "worm"

/o/ is realised back, half-close, rounded, lax.

24. The archiphoneme /N/.

/N/ operates in 'i' only, where it commutes with /B G Z s ŋ i u o/.

- N/b d g f x p t k m n ŋ a e o - precluded by distribution
- N/B /ka-iAN-tiN/ "tomorrow" /ka-iAB-tiN/ "calling"
- N/D ------
- N/G /kau-saN/ "lives" /kau-saG/ "one who lives"
- N/l ------
- N/ž /kaN-pa/ "for you" /kaž-pa/ "run"
- N/ž ------
- N/r ------
- N/s /kaN-pi/ "in you" /kas-pi/ "tree"
- N/ž /kaN-na/ "now you" /kaš-na/ "thus"
- N/i /kaN/ "you" /kai/ "this"
- N/u /žaN-pa/ "of the path" /žau-pa/ "beginning"
- N/o /kaN-pa/ "for you" /ka-pa/ "shout"

For the realisations of /N/, see p157.
25. The archiphoneme /B/.

/B/ operates in 'i' only, where it commutes with /N/.

\( B/b d g f x l p t k m n ñ a e o \) - precluded by distribution

\( B/N \quad /kä-iaB-tiN/ \quad "calling" \quad /kä-iaN-tiN/ \quad "tomorrow" \)

\( B/D \quad ------ \)

\( B/G \quad ------ \)

\( B/l \quad ------ \)

\( B/ž \quad ------ \)

\( B/č \quad ------ \)

\( B/r \quad ------ \)

\( B/a' \quad ------ \)

\( B/ä \quad ------ \)

\( B/I \quad ------ \)

\( B/u \quad ------ \)

\( B/ö \quad ------ \)

/B/ is realised unvoiced bilabial occlusive [p].

26. The archiphoneme /D/.

/D/ operates in 'i' only, where it commutes with /ž ě r o/.

\( D/b d g f x p t k m n ñ a e o \) - precluded by distribution

\( D/N \quad ------ \)

\( D/B \quad ------ \)

\( D/G \quad ------ \)

\( D/l \quad ------ \)

\( D/ž \quad /uD-ku/ \quad "cotton" \quad /už-ku/ \quad "man" \)

\( D/č \quad /uD-ku/ \quad "cotton" \quad /uč-ku/ \quad "hole" \)
D/r  /uD-ku/ "cotton"  /ur-ku/ "hill"
D/s  ------
D/i  ------
D/o  /uD-ku/ "cotton"  /u-ku/ "the inside"

/D/ is realised unvoiced apico-dental occlusive [t].

25. The archiphoneme /G/.

/G/ operates in 'i' only, where it commutes with /N/.
G/b d g f x p t k m n ŋ a e o - precluded by distribution
G/N  /kau-saG/ "one who lives"  /kau-saN/ "lives"
G/B  ------
G/D  ------
G/l  ------
G/z  ------
G/c  ------
G/r  ------
G/s  ------
G/ə  ------
G/i  ------
G/u  ------
G/0  ------

/G/ is generally realised unvoiced velar occlusive [k]. Before /ə/ in the same accent group, it is realised voiced velar occlusive [g]. In 'i', it may be realised unvoiced velar fricative [x].
1. System A.

In this section, I consider the phonemes of System A in their capacity as 'syntagmemes' (Def. 5b.). As a syntagmeme, a phoneme may be regarded, following Mulder, as an n-tuple of the form (e, k), where 'e' denotes the position in which /k/ stands. In such an n-tuple, we consider /k/ along with the position in which it stands. The relation between items such as (e, k) and others like it is one of simultaneity because, no matter how we order these items, their position relative to other items is implicit. A combination such as

\[(e, k) \cdot (n, u) \cdot (i, \bar{z})\]

is unordered for, if we give

\[(n, u) \cdot (i, \bar{z}) \cdot (e, k)\]

the ordering between /k/, /u/ and /\bar{z}/ remains the same.

The 'n-tuple' is defined as 'the product of a Cartesian multiplication'. The bundles given above are also n-tuples, which result from the following multiplication:

\[
\begin{array}{c}
(e, k) \\
(n, u) \\
(i, \bar{z}) \\
(e, p) \\
(i, \bar{z})
\end{array}
\]

The total multiplication yields four n-tuples, of which the one

---

1 Sets, p118.
2 ibid.
given above is one:

\[(e, k) \quad (n, u) \quad (i, \varepsilon)\]
\[(e, k) \quad (n, u) \quad (i, \tilde{s})\]
\[(e, p) \quad (n, u) \quad (i, \varepsilon)\]
\[(e, p) \quad (n, u) \quad (i, \tilde{s})\]

By considering all the phonemes of System A along with the positions in which they occur (working with position classes, p114), we can come to the total set of n-tuples of the above type for System A. The resultant n-tuples give us the logical set of syllable-instances of the form \((e, n, i)\). San Martín Quechua does not use all these possible syllables, and to account for those which are found and for those which are not found we establish distributional rules. The logical set of syllable-instances is given by Fig.1., p261.

The distributional rules do not seek to explain why a given combination of phonemes does not occur. Though we may suspect that a given combination is 'difficult' or 'sounds odd', it is not the task of the methodology to account for these suspicions. In any case, such suspicions are often very misleading. In San Martín Quechua, the combination /tl/* is not found. In Nahuatl of Mexico, such a combination is very common. In order to formalize our suspicion that /tl/ in San Martín Quechua 'sounds odd', we should find ourselves obliged to formulate inductive psychological hypotheses.

The distributional rules are designed solely to enumerate as
The Logical Set of Syllable-Instances (System A).

Fig. 1.
**Fig. 11.**

| 
| 'n' 'i' | eni eni eni eni eni eni eni eni eni eni eni eni eni eni eni |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p | t | k | l | m | n | ŋ | ŋ | ŋ | ŋ | ŋ | ŋ | ŋ |
| a | p | pap | tap | kap | map | nap | ŋap | ŋap | rap | sap | ŋap | iap | uap |
| i | pip | tip | kip | mip | nip | ŋip | ŋip | ŋip | rip | sip | ŋip | uip |
| u | pup | kup | mup | ŋup | ŋup | ŋup | ŋup | ŋup | ŋup | ŋup | ŋup | ŋup | ŋup |
| a | a | a | a | a | a | a | a | a | a | a | a | a | a |
| t | t | t | t | t | t | t | t | t | t | t | t | t | t |
| i | i | i | i | i | i | i | i | i | i | i | i | i | i |
| u | u | u | u | u | u | u | u | u | u | u | u | u | u |
| k | pak | tak | kak | mak | nak | ŋak | ŋak | ŋak | iak | uak |
| i | pik | tik | kik | mik | nik | ŋik | ŋik | ŋik | uik |
| u | puk | tuk | kuk | muk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk |
| N | paN | taN | kaN | maN | naN | ŋaN | ŋaN | ŋaN | iaN | uaN |
| i | pIN | tIN | kIN | mIN | nIN | ŋIN | ŋIN | ŋIN | uIN |
| u | puN | tuN | kuN | muN | nuN | ŋuN | ŋuN | ŋuN | uuN |
| a | ŋ | paź | kaź | mak | nak | ŋak | ŋak | ŋak | iak | uak |
| t | t | t | t | t | t | t | t | t | t | t |
| i | i | i | i | i | i | i | i | i | i | i |
| u | u | u | u | u | u | u | u | u | u | u |
| k | pak | tak | kak | mak | nak | ŋak | ŋak | ŋak | iak | uak |
| i | pik | tik | kik | mik | nik | ŋik | ŋik | ŋik | uik |
| u | puk | tuk | kuk | muk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk | ŋuk |
| N | paN | taN | kaN | maN | naN | ŋaN | ŋaN | ŋaN | iaN | uaN |
| i | pIN | tIN | kIN | mIN | nIN | ŋIN | ŋIN | ŋIN | uIN |
| u | puN | tuN | kuN | muN | nuN | ŋuN | ŋuN | ŋuN | uuN |
| a | ŋ | paź | kaź | mak | nak | ŋak | ŋak | ŋak | iak | uak |
| i | i | i | i | i | i | i | i | i | i | i |
| u | u | u | u | u | u | u | u | u | u | u |
| & | & | & | & | & | & | & | & | & | & | & | & | & |
| & | & | & | & | & | & | & | & | & | & | & | & | & |
| & | & | & | & | & | & | & | & | & | & | & | & | & |
| & | & | & | & | & | & | & | & | & | & | & | & | & |
| & | & | & | & | & | & | & | & | & | & | & | & | & |

The Attested Syllable-Instances(System A).
concisely as possible which combinations of phonemes do occur and which do not.

The attested syllables of System A are given by Fig. 11, p. 262.

The present statement of phonematic distribution does not claim to be exhaustive. I would claim for the statement only a modest degree of success. I have succeeded in establishing several useful rules which account for some of the important aspects of phonematic distribution. However, particularly in the case of those syllable-instances which have three phonemes in them (i.e. where 'e', 'n' and 'i' are each filled), no simple generalization for phonematic distribution presents itself. There comes a point where a list of the attested syllable-instances is as informative as a random set of statements which apply to only a part of the material. The present statement of distribution tends towards using an informative tabulation, rather than a long list of random statements. Only where a rule which has wide generality presents itself have I formulated a fully-fledged distributional rule.

Mulder defines 'distribution' in the following way:

"It is a set of statements concerning which combinations of items are possible within the unit which I have called the distributional unit."

Mulder also states the two types of context in which an item may be

---

regarded as occurring:

1. The **position** itself in which the item occurs.
2. The context consisting of other items (within the same distributional unit) each in its position.¹

2. **Main Distribution Classes.**

   These classes were alluded to on p. 114. In System A, these may be calculated by enumerative reflection, but in order to show exactly the nature of these classes, I include a Venn Diagram which shows the classes MDsA, MDsB and MDsC:

   **Fig. 111.**

   ![Venn Diagram](image)

1. **Sets, p223.**
The correspondences between these classes and Feats in System A has already been noted.¹

The simplest way to arrive at a statement of the distribution of phonemes is to begin with the item in the nuclear position, and to work outwards from that item to the items which occur in the peripheral positions along with it. It becomes clear that left-hand expansions of the nucleus should be taken first for the simple reason that nearly all the phonemes of pose can be left-hand expansions of any nucleus. Right-hand expansions are much more restricted.

The possible mono-phonematic syllables in System A are /a/, /i/ and /u/. Limiting ourselves to the distribution of these phonemes for the moment, both /u/ and /i/ can be expansions of /a/ on the right or left, but only /u/ can come on the left when all three positions are filled. We have /uai/, but not /iau/*. The phoneme /i/ can be a right and left-hand expansion of /u/, yielding /iui/ - or, if either peripheral position is filled by 'zero', we have /iy/ and /ui/. The phoneme /u/ can only be a left-hand expansion of /i/. The phoneme /u/ occurs only once in a syllable if it is in the nuclear

¹See p125-6.
position - we do not have /uñ/, /uñ/, /uñu/. The phoneme /i/ can be a right-hand expansion of itself, and is the only phoneme among the vowels which can be. In the distribution classes, /a/ is already assigned to 'n', therefore we need not consider it in the peripheral positions. Other phonemes are always expansions of /a/.

1. /a/ in 'n'

```

<table>
<thead>
<tr>
<th>ia</th>
<th>a</th>
<th>ai</th>
</tr>
</thead>
<tbody>
<tr>
<td>uñ</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>uai</td>
<td>au</td>
</tr>
<tr>
<td></td>
<td>uau</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iai</td>
<td></td>
</tr>
</tbody>
</table>
```

2. /i/ in 'n'

```

<table>
<thead>
<tr>
<th></th>
<th>i</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>ui</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>uii</td>
<td></td>
</tr>
</tbody>
</table>
```

3. /u/ in 'n'

```

<table>
<thead>
<tr>
<th>iu</th>
<th>u</th>
<th>ui</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>iui</td>
<td></td>
</tr>
</tbody>
</table>
```

Another way of representing the above is as follows:

left     'n'     right

i, u ——> a ——<— i, u
u ——> i ——<— i
i ——> u ——<— i
If we denote by any phoneme of pose, we can formulate the following table:

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>ϕ</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>- 1</td>
<td>N</td>
</tr>
</tbody>
</table>

That is, when /a/ is in 'n', all of pose can come in 'e', when /O/ or /N/ fills 'i'. The phoneme /l/ has to be excluded from the table, for it does not occur in 'e' when /N/ fills 'i'. If we had confined ourselves to the context (a, a, ϕ), we could have said that all of pose can come in this context.

Where denotes pose, we have the following when /i/ is in 'n':

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>ϕ</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-(i, i, i)</td>
<td>N</td>
</tr>
</tbody>
</table>

That is, all of pose, except /i/, /i/ and /l/, can come in the contexts (a, i, ϕ) and (a, i, N). The syllables /i10/*, /iiN/*, /ii0/*, /iiN/*, /li0/* and /liN/* do not occur.

Where denotes pose, we find the following when /u/ is in 'n':

<table>
<thead>
<tr>
<th></th>
<th>u</th>
<th>ϕ</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>- u</td>
<td>N</td>
</tr>
</tbody>
</table>

That is, all the members of pose except /u/ itself can be left-
hand expansions of /u/, when /0/ or \( /N/ \) fills 'i'.

From the above, it is quite clear that when the elements /0/ and \( /N/ \) fill 'i', almost the whole inventory of the system can come in 'e', given any nuclear phoneme. When a phoneme other than /0/ or \( /N/ \) fills 'i', there is considerable restriction to the possible phonemes in 'e', given any nuclear phoneme. Intuitively, syllables of the type 'CV' and 'CVC' (where \( /N/ \) is syllable-final) are very productive in System A.

Right-hand expansions of the nucleus are much more restricted than left-hand ones. If we symbolize the posis by \( \mathcal{N} \), and consider the situation when /0/ is in 'e', we can state the restrictions to right-hand expansions.

1. /a/ in 'n':

\[
\begin{array}{ccc}
\emptyset & a & \mathcal{N}-(\text{c, p, k})
\end{array}
\]

2. /i/ in 'n':

\[
\begin{array}{ccc}
\emptyset & i & \mathcal{N}-(\text{c, k, p, r, t})
\end{array}
\]

3. /u/ in 'n':

\[
\begin{array}{ccc}
\emptyset & u & \mathcal{N}-(p, s)
\end{array}
\]

What remains to be established is a set of rules to account for the syllable-instances where all the positions are filled by a phoneme. As I explained above, the attempt can only be moderately successful, for the attested syllables of this kind are very
amorphous. However, some fairly clear-cut conclusions can be reached, which I shall give here.

One of the most useful classes which one can establish is that class whose members can occupy both 'e' and 'i' in the same syllable-instance. This is the set \{p, k, r, ŋ, (mñ, N)\}. We have already cited /i/ and /u/ as occurring in both 'e' and 'i' in the same syllable-instance. I include the nasal series and the archiphoneme /N/ because, with the exception of combinations already excluded (e.g. /ńi/*), all syllables of the shape (nasal, vowel, nasal) are attested:

<table>
<thead>
<tr>
<th>maN</th>
<th>naN</th>
<th>ŋaN</th>
</tr>
</thead>
<tbody>
<tr>
<td>miN</td>
<td>niN</td>
<td>---</td>
</tr>
<tr>
<td>muN</td>
<td>nuN</td>
<td>ŋuN</td>
</tr>
</tbody>
</table>

The other phonemes in the set mentioned above yield the following syllables:

<table>
<thead>
<tr>
<th>pap</th>
<th>pip</th>
<th>pup</th>
</tr>
</thead>
<tbody>
<tr>
<td>kak</td>
<td>kik</td>
<td>kuk</td>
</tr>
<tr>
<td>rar</td>
<td>rir</td>
<td>rur</td>
</tr>
<tr>
<td>ŋaŋ</td>
<td>ŋiŋ</td>
<td>ŋuŋ</td>
</tr>
</tbody>
</table>

I have already listed /iai/, /iu/ and /uau/.

Beyond this stage, one can do little more than list the combinations which occur. This has already been done in Fig.11.
The rarity of the phoneme /z/ in 'i' is notable; on the other hand, /z/ occurs in a great variety of syllables in this position (one reason for this difference between /z/ and /s/ is discussed below).

The phoneme /u/ in 'i' occurs only when /a/ is in 'n', in the syllables /Oau/, /pau/, /çaau/, /kau/, /ãau/ and /rau/. We are led back to the fact that {p, k, r, s, i, N} are the most versatile of the phonemes of System A as far as combinability with nuclear and explosive phonemes are concerned. There is an important point to be made here. Each of those items is part of the phonological form of a grammatical element — in each grammatical element, the phoneme in question comes in 'i', no matter where the grammatical element figures. The grammatical elements are:

"/p-ti/" participial
"/-k/" agent
"/-k-ka/" past distant
"/-ã-ka/" past recent
"/-i-ka/" actualizer
"/-N/" 3rd person

Many of the syllable-instances attested for System A are found only because of combinations of grammatical elements such as the following:

"/surku-pu- pti-N/" "while he takes it out"
"/puša-ška-N/" "he led"

1 I have given only one example for each of the phonological items in question.
This makes the statement of distribution very difficult because, in some ways, it is possible that it is an untrue reflection of the system as a whole. The syllables /pup/ and /śaś/, attested in phonological forms such as /surkupupńïN/ and /puṇśaśkań/, do not figure in the forms of lexical items. Statistically, the statement cannot be held to be representative of the language as a whole. However, what is really crucial is that the syllables /pup/ and /śaś/ are attested, while many syllables such as /tut/* and /sas/* are not. This holds even in spite of the fact that the phoneme /p/ occurs in "i" only in the phonological form of the grammatical element "/p-ți/", and never in the form of a lexical element.

The set {ś, r, s, ṣ, ņ, u, N} of posi can come in absolute final position in the phonological word. In this position, /s/ is attested only in /kańśis/ "seven", and /u/ only in /puńśau/ "day-light". The set {p, t, ṭ, ṣ} may not occur in this position. They may only come in 'i', when the syllable/distributional unit in which they occur is followed by another syllable/distributional unit.

When two syllables come together, and the implosive position of the first is filled by a phoneme, the explosive position of the second is always filled. There are no bi-syllabic forms such as /kap-a/, where the second /a/ is in 'n'.

There are no bound syllables in San Martín Quechua in System A.

\[1\] For 'phonological word', see p184.
3. System B.

The main distribution classes of System B were given on p217. I shall not repeat the calculus here, but shall merely list the classes for reference:

- 'el' only: b d g f
- 'E' only: m n ŋ x
- 'el', 'E': p t k
- 'E', 'i': ź ĺ ź
- 'E', 'e2', 'n', 'i': i u
- 'E', 'e2', 'i': l
- 'E', 'el', 'e2', 'i': r
- 'E', 'el', 'i': s
- 'n' only: a e o
- 'i' only: N B D G

First, I shall consider the combinations of phonemes in 'el' and 'e2'. As n-tuples, these are combinations such as the following:

\[(el, p) (e2, r)\]

Earlier in the thesis, I referred to these as complex items. This is because, in System A, they have to be described, if at all in the system, as single phonemes, in which case they are best termed complex items. In System B, we have two 'explosive' positions, therefore we can consider /pr/, for example, as a sequence of two phonemes /p/ and /r/. The attested combinations of phonemes in 'el' and 'e2' can be

\[1\text{See p52-4.}\]
We can perform further Cartesian multiplications in order to arrive at further combinations of phonemes. For example, if we include in the multiplication the syntagmeme \((n, a)\), and multiply it by the \(n\)-tuple \(\{(\text{el}, p)(\text{e2}, r)\}\) in particular, we arrive at:

\[
(\text{el}, p) (\text{e2}, r) (n, a)
\]

which, converted into paradigmemes is the syllable /pra/. On the following page, I have given the attested syllables of this form (i.e. consisting of phonemes in 'el', 'e2' and 'n') in a table which is very similar to the above.

One salient feature is the non-occurrence of the phoneme /i/ in 'n', when both initial positions are filled, 'e2' by either /i/ or /u/.
<table>
<thead>
<tr>
<th>'el'</th>
<th>'e2'</th>
<th>Combinations in (el, e2, n).</th>
</tr>
</thead>
<tbody>
<tr>
<td>pr</td>
<td>pra</td>
<td>pre</td>
</tr>
<tr>
<td>pl</td>
<td>pla</td>
<td>pie</td>
</tr>
<tr>
<td>pi</td>
<td>pue</td>
<td></td>
</tr>
<tr>
<td>pu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tr</td>
<td>tra</td>
<td>tre</td>
</tr>
<tr>
<td>ti</td>
<td>tia</td>
<td>tie</td>
</tr>
<tr>
<td>kr</td>
<td>kra</td>
<td></td>
</tr>
<tr>
<td>ku</td>
<td>kua</td>
<td>kue</td>
</tr>
<tr>
<td>br</td>
<td>bra</td>
<td>bre</td>
</tr>
<tr>
<td>bl</td>
<td></td>
<td>bli</td>
</tr>
<tr>
<td>bi</td>
<td>bia</td>
<td>bie</td>
</tr>
<tr>
<td>bu</td>
<td>bue</td>
<td></td>
</tr>
<tr>
<td>dr</td>
<td>dra</td>
<td>dre</td>
</tr>
<tr>
<td>di</td>
<td></td>
<td></td>
</tr>
<tr>
<td>du</td>
<td>due</td>
<td></td>
</tr>
<tr>
<td>gr</td>
<td>gra</td>
<td>gri</td>
</tr>
<tr>
<td>gu</td>
<td>gua</td>
<td></td>
</tr>
<tr>
<td>fr</td>
<td>fre</td>
<td>fri</td>
</tr>
<tr>
<td>fi</td>
<td>fia</td>
<td>fie</td>
</tr>
<tr>
<td>fu</td>
<td>fue</td>
<td></td>
</tr>
<tr>
<td>si</td>
<td>sia</td>
<td>sie</td>
</tr>
<tr>
<td>su</td>
<td>sue</td>
<td></td>
</tr>
<tr>
<td>ri</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ru</td>
<td>rue</td>
<td></td>
</tr>
</tbody>
</table>
For the distribution of vowels in System B, we have to consider combinations in 'e2' and 'n' in syllables of the form (e1, e2, n, i). The attested combinations are:

<table>
<thead>
<tr>
<th></th>
<th>'n'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
</tr>
<tr>
<td>e2</td>
<td>ia</td>
</tr>
<tr>
<td></td>
<td>u</td>
</tr>
</tbody>
</table>

The phoneme /u/ cannot be a left-hand expansion of either /o/ or of itself.

Taking now the combinations in 'n' and 'i', we have:

<table>
<thead>
<tr>
<th></th>
<th>'n'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
</tr>
<tr>
<td>i</td>
<td>ai</td>
</tr>
<tr>
<td>i</td>
<td>—</td>
</tr>
<tr>
<td>i</td>
<td>—</td>
</tr>
</tbody>
</table>

The restriction to the occurrence of /u/ as a right-hand expansion of any nuclear phoneme is significant. In System A, /u/ is a right-hand expansion of /a/ in the syllables /au/ and /uau/(and in others where 'e' is filled by certain phonemes of pose). The syllables (hypothetical) with /au/ in 'n' and 'i' of the type /krau/* are not realised. The syllable /uau/ occurs in (E, n, i). The phoneme /i/, on the other hand can be a right-hand expansion of all the nuclear phonemes, when 'e1' and 'e2' are filled.
The distribution of phonemes in syllables of the type \((E, n, i)\) is very similar to that of System A. As far as the phonemes \(a\ i u\) are concerned, the distributional statement for System B would be a carbon copy of that for System A. It would not be true to say that the distribution of the phonemes \(a\ i u\) in System B syllables of the type \((E, n, i)\) is the same as in System A syllables of the type \((e, n, i)\). However, for all practical purposes, I may save a repetition of the statement by referring the reader to the statement for System A on p.265. If one replaces 'e' by 'E', one arrives at a statement which parallels exactly that which would be made for System B for the distribution of \(a\ i u\).

In syllables of the type \((E, n, i)\), the phonemes \(o/\) and \(e/\) operate in 'n' only. The phoneme \(i/\) can be a right or left hand expansion of \(o/\) – it is a left-hand expansion, however, only when \(i/\) is filled by a phoneme e.g. \(ioN/\). The phoneme \(i/\) can only be a right-hand expansion of \(e/\), and only when there is a phoneme in 'E' e.g. \(rei/\). The phoneme \(u/\) cannot be either a right or left-hand expansion of either \(o/\) or \(e/\). It can be a left-hand expansion of those phonemes only when it is in 'e2' and 'el' is filled by a phoneme.

If I denote by \(Z\) the class posE, I can formulate some tables similar to those formulated for System A, in order to account for some of the combinations of phonemes not yet accounted for in System B.
The absence of syllable-instances /e/ and /o/ has an intuitive diachronic explanation in the fact that mestizo Spanish lacks a phoneme /ɔ/. Given that the majority of cases of /o/ and /e/ are to be found in 'Spanish' forms, it not at all surprising that these two potential syllables should not be realised.

If I symbolize by $\emptyset$ the class posi, we can give rules for the attested syllables of the form (E, n, 1), where 'E' is filled by 'zero'. They are much more restricted than those where 'i' is filled.
by 'zero':

1. /a/ in 'n'

| Ø | a | Ø | -(B, D, Ğ, s) |

2. /i/ in 'n'

| Ø | i | Ø | -(B, D, Ė, Œ, r, u) |

3. /o/ in 'n'

No phoneme of posi occurs

4. /e/ in 'n'

| Ø | e | Ø | -(B, D, Ė, Œ, s, ŋ, ū) |

5. /u/ in 'n'

| Ø | u | Ø | -(B, Ė, Ń, ŋ, ŋ, ū) |

Very few syllables of this kind occur in System B.

The situation with those syllables where all three positions in (E, n, i) are filled is such that a simple set of generalizations is not possible. The set of 'Spanish' forms is limited, and the presence of this limited set of forms give rise to a very amorphous set of syllable-instances.
The distribution of phonemes is the least revealing for the problem of Systems A and B, upon which much of the work in the thesis has centred. In view of this, it is not too perplexing to have to settle for an unsatisfying statement of phonematic distribution.

One or two factors may be noted. Earlier, I cited the set of phonemes \{p, k, r, ñ, i, N\} as forming part of grammatical elements\(^1\) which, in combination with other grammatical elements, give rise to phonematic combinations on the form level such as /Sañ/ and /pup/ which do not figure in the phonological forms of lexical items. A significant feature of syllables of the type \(el, e2, n, i\) in System B is that, while we find quite a few syllables of the form /grañ/, /grai/, /grap/, /grak/, /grar/ and /gran/, we do not find any such as /grat/*, /grau/*, /graz/* i.e. there are no syllables which have a combination in \(el, e2\) and a diachronically 'Quechua' phoneme in 'i', which is other than one of the cited set.

Scanning the inventory of syllables and the phonological data as a whole, it emerges clearly that 'Spanish' forms are confined mainly to the forms of lexical elements. The phonological forms of those elements which Martinet calls 'grammatical monemes'\(^2\) are all diachronically 'Quechua'. In combination, the lexical and grammatical

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\(^1\)See p.270.

\(^2\)EGL, 4.19.
elements lead to phonological forms such as /grag/, which do not figure anywhere else in the system except in the forms of such combinations on the level of grammar. Intuitively, the syllables such as /grag/ are a 'bridge' on the form level between 'Spanish' and 'Quechua' elements. These syllables pose several problems for the descriptivist seeking a simple generalization with which to account for the data. This is simply because the attested syllables with a combination of phonemes in (el, e2) are in themselves relatively few in number, and not easily formalized.
SAMPLE OF PHONOLOGICAL FORM (SYSTEM A)

/bruxokuna/

1. bruxokunaka kai pišua'ia tukui partępi kausaN (2) tukui Žaktapi ti'iaN bruxokuna (3) kai bruxokuna sasikuN / upiaN purgata kašna uNkušpa // uakInka urmamušpa kaspimaNta ki'uikuNči / uasikunata armašpa śiNpamaNta urmaNči (4) uakInNta uaktaku'uNči bestia
(5) čaikunapi ki'uikuNči (6) sasikuNsapa sukamaN ažita (7) čaipi sasikušpaka žablōtaka apiNsapa (8) paikunaka upiaNsapami bušikžata / iakuasisata / ču'iačakita / bolakiruta / čuču'uašata / renakata
(9) čaikunami bruxōtaka ruraN (10) sasikuNsapa tōlda ukupi ažita
(11) sasikuNsapa sukamaN.ažita mikušpaka suk inkirižuta (12) asta iškai kižata kimsa kižata sasikuNsapa (13) manaN nimataču kačikuNsapa (14) čaimaNta uirata mikuNsapa uatapi (15) čai čikaN mikanuta mikuNsapa uatapi (16) mikuNsapa sasikušpaka kai buxurkita / aňašu-uata / šitarita / firirinNta (17) manaN mikuNsapaču uankanata / Žuičuta / ituksita (18) tukui čaikunata sasikuNsapa ni mikuNsapaču porotota ni arōsta (19) čaipi paikuna sukamaN taba'iaN (20) taba'iaN deberas kižu likidu ŽukšiNsapa sasikuimaNta (21) iděN sukamaN sünči uNkuđu šina (22) čaimaNtana atipaNsapa paikunaka bruxōna tukuN
(23) ŽakakuNsapa (24) proibaNsapa birotenKunata bakapi /bestiapı / ažkupı / uamrakunapi / uañušiNsapa (25) čaimaNta na ašuaN mašia-pitInKunana žablōNkuna (26) manaN kikiNKuna munašpaču / žablō

Exclamations are not part of phonological form, and are given between apostrophes e.g. 'ai', 'pun' etc.
supaina ñakakuN ñakadúinsapa (27) čašnami paikunaka kausaN
(28) medikokunapiš ti’iaN ñakadukunataka atipažinsapa (29) paikunapiš čašna sasakišpa medikok’iaN (30) manaN paí bruxodiču (31) uakinKa bruxo / manaN tukuči (32) tikeninsapa kai medikokunatapiš brUX-
kunaka birotëNkunata surkuptiNka / faaborta rurakuptiNkuna (33)
uakinKa uainuči ñakadu’uaN manaN utka medikota maskašpa (34) uakInKa medikota manaN munaču (35) manaN munašpa riNsapana sanitarišomaN
doktornaN tuksinakuk (36) upiašsapam kontrata / čaikunauaN
uainuči ñakadu kašpaka (37) manaN ñakadu kašpaka atipač (38) čai-
raiku uakinKa prëmišmedikokunapi taňte’iačinakuk unkučikušpa (39) unkušpaka kikinsapa riNsapana taňte’iačinakuk / ranšišpa tragô-
Nkunata (40) tragôuarnami medikokunaka taňte’iauńči / faaborta
rurán (41) manaN tragôuanka manaN (42) čašnami paikunaka kausaNsapa
kausanisapa ųukaIunaka / kai bruxokunaka sukamaN čiknidumi kausak
(43) medikokunaka uakInka żuzakušpaka uakaiču’uńči uasinKnunapi
(44) taňte’iauńči / ñakadumiauńči / čupanapa kańki (45) čašna
čaiši suk iškai kižata kausaituńčisapa sukamaN gastakušpa
(46) tukuI la’iata rańtińči / tragôta / mikunata / plantranuta / iańtata čurašpa (47) sukamaN gastačiuńči (48) čaimanta despaż-
uanńči oras kobra’uńči iškai pačak / kimsa pačak / sokta pačak /
pusak pačak (49) manaN kužki’iuk kaspanńči / maipiti tarńči / ma-
piti tarń (50) modosta rurašpa pagarakuńčuna ti’iaN žuzakušpa
(51) manaN atipašpanknakuna sanolaita kobranšapa (52) čaimanta
kaškaN suk medikőmaN riptin / suk uižaN manaN ñakaduču kańki / rižai
sanitariöpi / tuksinakumui / doktormaN rižai (53) deberas zaimaN rišpa tuksičinakun (54) doktorpiš ganaN sukamaN karuta (55) kobraN tuksišpaka paikunapiš asta pusak pačak / iskødN pačak (56) uakinña manaN taNte'iačikušpa rišpami doktormaN uańuNeapa (57) doktorpa remediöka aNpi ğakadupaka

Witches

(1) Witches live everywhere in this Pishwaya (2) there are witches in every town (3) these witches diet, drink remedies, as if they were ill; you know, some of us fall from a tree and injure ourselves; or, mending the house, we fall from the roof (4) our horses throw some of us (5) in those things we injure ourselves (6) they (the witches) diet really hard (7) there, while dieting, they reach their devils (8) they drink 'bushik', 'yakusisa', 'chuyachaki', 'bolakiru', 'chuchuwasha', 'renaka' (medicinal drinks) (9) these things make them into witches (10) they diet really hard under a mosquito-net (11) they diet really hard, eating only one green banana (per day) (12) up to two, three months they diet (13) they don't put salt on anything (14) then they eat fat for a year (15) they don't eat hog, deer, 'ituksi' (18) all those things they diet, and they don't eat beans, nor rice (19) then they get really thin (20) they indeed get thin - they come out of the diet pure yellow (21) like some really sick person (22) after that, they can carry out the task of a witch (23) they bewitch (24) they test their poison-dart on cows, on horses, on dogs, on children, and they kill them (25) by this time, their devils are mothering them a lot (26) they themselves don't want to bewitch people, but their devil bewitches, making them bewitch people (27) that's the way they live (28) there are shamans too; they can help the bewitched person get well (29) they too diet and become shamans (30) the shaman is not a witch (31) some are witches, but not all (32) the witches hate the shamans, for they take out their (the witches') poison-darts, and help people (33) some of us die with the curse if we don't look for a shaman quickly (34) some don't like the shaman (35) not liking him, they go to the hospital-post, to the doctor, to be injected (lit. to get pricked) (36) they drink 'kontra' (trade-name), but with these things we die, if we are bewitched (37) if we are not bewitched, we can take them (38) because of that, some people first have themselves examined by the shaman, when they are made ill (by the witch) (39) being ill, they themselves go and get examined, buying liquor
(40) with a drink from us, the shamans examine us, help us
(41) without their drink, they don't (42) that way they live; that
way we live; these witches live a hated life (43) some shamans
tell lies, and tie us down to their houses (44) on examining us,
they say,"you're bewitched, you must be sucked" (45) that way they
make us live one or two months, spending lots of money (46) we buy
all kinds of thing - drink, food, bananas, fire-wood - all this we
put(before them) (47) they make us spend a lot (48) then, when the
time comes to send us off, they charge us 200, 300, 600, 800(sols)
(49) being poor, where do we find it? where does he find it?
(50) making sacrifices, they must pay by telling lies (51) and,
not being able to cure us, they charge money (52) then, once more
going to a shaman, he says,"you're not bewitched; go to the hospital-
post, get an injection; go to the doctor" (53) indeed, going there,
they get themselves injected (54) the doctor too earns a lot of
money (55) for an injection they charge up to 800, 900(sols)
(56) some don't go and get examined(by a shaman), and still go to
the doctor - they die (57) the doctor's medicine is poison for a
bewitched person.

2. /siNkasapa/

(1) suk pačaši suk uaināka ča'iaŋ uasip1 / ti'iarkaŋ suk čipač
(2) manaŋ iačašapacu tataŋ manaŋka čipašpa imaraikumi ča'iaŋ
nišpa (3) uižak čai uainata / šamu iai Kumui / šamu samai
(4) rik pakačanakuk baŋkőpi / manaŋ rikču ti'iariik / pakačanakušpa
parlak (5) čaina parladu karkaŋ čai čipašuaŋ kasaranaŋpa (6) parla-
ptiN uižarkaŋ čipaška tatainpi šamu maňak / maňadumi kasarašuŋ
(7) niptiŋka tataŋta manaŋta uižarkaŋ čai mašuka kasaranaŋpa /
tata parladumi kani suk čIPAšuaŋ / pušawaiči maňak tataŋpi manaŋpi
(8) niptiŋka rirkaŋ /pušarkaŋsaŋpa tataŋ manaŋka maňak' (9) čaimaŋta
uainaka rirkaŋ baŋkőpi sirišpa pakačanakuk (10) tataŋka ka'iarkaŋ
čipašniŋta / deberasću parladu kanši kai uaina'uaŋ (11) ari'ıa
tata parladumi kani/ nišpa uižarkaŋ (12) uarmipa manaŋka uižarkaŋ
"Big Nose"

(1) Once upon a time, a young man used to arrive at the house; there was a young girl

(2) The father and mother of the young girl didn't know why he arrived, they say

(3) They would say to that young man, "come in, rest" he would go and lie face down on the bench; he wouldn't go and sit down, but, lying face down, he would speak

(4) He was engaged to that girl to be married

(5) Being engaged, the girl said, "come and ask of my father; when you have asked for me, we will marry"

(6) When she said that, that young bat told his father and mother, in order that he might get married, "father, I'm engaged to a girl; take me to ask for her of her father and mother"

(7) Saying that, they went; they took him to ask of her father and mother

(8) Then, the young man went and rested, lying face down on the bench

(9) The father called the young girl, "is it right that you are engaged to this young man?"

(10) Yes, father, I am engaged, she told him

(11) The mother of the young girl said to the father of the fiancé, "may that young man get up, so that I may see his nose, to find out if it is alright or not" she said

(12) Her father called to the young man, "get up! sit up!", but he didn't want to get up

(13) Then the father went and got him up by his hand

(14) Getting him up, the girl's mother saw she said, "Oh, God! that man doesn't have a nose! why on earth will she marry a man without a nose! my little baby has a huge nose, and I don't want her to marry that kind! he doesn't have a nose!"

(15) Therefore, very ashamed, they returned; the girl's mother didn't want them.
(1) ti’iarkan suk uaina / ti’iarkan šipaškuna (2) čai uainata
sukamaN šipaškunaN kičunakuk / munaksapa tukui (3) uainaka manaN
munakču (4) šipaškuna sukamaN kičunakuk paita munaksapa tukui šipaš
ka’uaškaNkuna (5) čaimanta tantsipi suk šipašuaN kasararkaN (6) čai
sukniN šipaš munak / sukamaN žakirkaN / rabiarkan maňak iaiKuptin-
kuna pai’uAN maňakuptinkuna pai’uAN kasaraptiNna (7) čaimanta
diiata čurašpa kasararkaN (8) kasarašpa ųa tataNuaN manaNuaN
kausarkaNna (9) čaipi čai šipaška rabišpa uizarkaN tataNta manaN
pai’uAN kasaraptitN /tata kai uainatami sukamaN munaskani / parladumi
kaškani / manaNmi ųuka’uanču kasaraN čikan uarmi’uaN kasaraN nišpa
rimarkaN (10) čaimanta uizarkaN / tata rinimi ųuka balekuk suk
medikopi / medikškunami paita ažičan animaNta apičik ųuka’uaN
kasaraNapa / nišpa uizarkaN tataNta (11) tataNka uizarkaN / rižai
balekumui / paimi iacančka / paimi iacan imašnami ruraN nišpa
(12) čaimanta čai šipaška rirkaN deberas suk medikopi parlačik
(13) parlačičpa uizarkaN kašnami / čai uainaka parladuni kaškaN
manaN munuaškaNču / čikanuaN kasaraškaN / čairaiku munani ųuka
rekofita čai runata / kičuita uarminta kusanča / ųukami sukamaN
munani kasarašpa kausaita / animaNta apičpa paita ganapa’uai
(14) niptin uizarkaN medikška / arśia ųukami ųukami apini animaNta
manaN čai’uAN atipašpiniču ųukami iaku runa’uaN iakupi urmačini / iakupi kausaNka žablškuna’uaN / supaikuna’uaN / sirinakuna’uaN nišpa
uižarkaN (15) čaipi uižarkaN šipaška / čašna rurapai / paitapiš
munani fregaita / imaâna çai âukata frega'uaâkaN âina (16) ëipaâka
uiçaâpa sakirkaN (17) rurapaâki çai ruegaâkainita / niptiNka
uiârkaN (18) deberas çai uainaka kausarkaN suedróNuaN (19) suedaró-
NuaN kausaikaâpa uarmiNuaN rik armakuk (20) armakuk riptiN pai
manaN iaârkaNci imatami ruraâina'ârkaNsapa (21) nitimuk maNâiba
olaxada / iaku / iaku çauâmaNta nitimuk (22) manaN iaâcaâci uimapami /
tântipi rikurirkaN suk iaku runa (23) uiârkaN kaNci kaNki kai
uaina gabilaN (24) çaipi pai uiârkaN ari'ia ëuka (25) kunaN ëuka
esika puâaïki / ëukami montonâta maskaiki / ëuka'uaN kausanaiki ti'iaN
iaku ukupi / ëukami iaku ukupi kausani / uiâaNsapa iaku runa niNpa
(26) çaipi pai uiârkaN / manaNmi nima la'iapi puâa'uaâkicû / kunaNmi
esika kanâtaS bale'iaâpa uanûcini / ëukapami ti'ia'uaN suk
ëskopëtaini uanûcainipä (27) niptiN maNcakûpa iaku runa sakirkaN
(28) çaimanâta çââna katiksapa sukamaN / iakuta armakuk riptiN /
olaxadas nitimuk (29) maNcakuâpa çai uainaka rirkaN takraNpi kausak
suk maipiâça manaN atuN iaku ti'iaN çaipi (30) suk positupi armakuk
uarmi rik iakumaN (31) montonâta maskaëpa iaku runaka ëata tarirkaNna
capi (32) çaiпици armakuk riptiN /iakumaN riptiN çââna olaxadas
nitimuk (33) paçiamuk ëaupi positumaNta / maNâibaNta paçiaN / çaipi
sukamaN maNcakuk (34) çaipi simiçina'iaN iaku runaka / manaN
puederkû (35) çaimanâta rimarkaN / uarmitpi uiârkaN / kunaN esika
maNnaN iakumaNka rinicû / sukamaNmi iaku runaka puâa'uaana'iaN
ku'ia'uaN çikni'uaN / kaipi kai kaN iakuta apamui kaN uasîncimaN
armakunainipä / manaNmi armakuk rina'ianicû iakupika / apamui
puiŋupi umažiŋpa nirkaŋ (36) niptiŋ deberas iakuta apak uarminka uasiŋpi armakunaŋpa (37) uasiŋpi armakuk čai runaka (38) niptiŋ taŋtöpika kaškaŋ ŋata kuŋkaŋpa rirkaŋ atun iakupi armakuk (39) kaškaŋ armakuk riptiŋ tarirkaŋ montonța maskaŋpa (40) monton olaxadas nitimuptiŋ sumičik (41) makinuaŋ despido kiri niñimami rini-nami uizaptiŋ (42) uarminka uizak / impata saki'uaŋki gabilaşıtu / pa'umui / ama defakuiču pušašunaŋpa (43) niptiŋ čai gabilaŋ kusaŋka pa'umuk (44) pa'umuk iaku ukumaŋta kaškaŋ (45) pa'umumuŋpa ladąŋpi čai'arimuk (46) uarminka pušak abrasaŋpa uasiŋkamaŋ (47) sukamaŋ kušikui puru mančakui puru (48) čašna katipitŋ kaškaŋ uizarkaŋ / kunan esika manaŋ armakupaka kusaša (49) čaimaŋta iaku puiŋupi asta iaku puiŋupi rikerik iaku runaka (50) iaku puiŋupi sumičina'iaŋ (51) iaku puiŋupi rikerik iaku runa (52) čaipí mančakuŋpa uizarkaŋ / kunan manaŋ iaku puiŋupika iakukuniču /patiŋ čurapai iakuta upianainipa / mančakunimi iaku puiŋuta ratakuita /čaipimi sumičinaiaŋ iaku runaka (53) niptiŋ uarminka čurakuk iakutami kada mikunan oras patiŋ (54) upiak čaipí (55) čaipidi kaškaŋ runak (56) iaku runaka sumičina'iaŋ patiŋ (57) čašna kusačik sukamaŋ tieŋpo katiŋpa cikniŋpa sumičinaiaŋpa patiŋ (58) taŋtöpi su'urakaŋ čai iaku runaka / iaku patiŋ sumičirkaŋ (59) manaŋ iaćarkaŋsapaču maipimi činkangaškaŋ (60) uarminka iaćarkaŋ (61) iaku patiŋ pai činkangaŋ (62) rirkaŋ tatan mamaŋta uizak uarminka / činkangaškenami tata gernökika iaku patipina / manaŋmi ka'uašiču mikuikaptiŋziala ka'uaškani činkaptiŋ / iaku patipina sumiškaŋ / iaku runami puša-
"The River Man"

(1) There was a young man; there were young girls (2) the girls really squabbled over that young man, and they all loved him (3) the young man didn't love them (4) the girls really squabbled over him, for on sight every girl fell in love with him (5) meanwhile, he married a young girl (6) another girl loved him, and she was really sad and angry that they had gone (to the parents) and asked (to get married), and that he had married her (7) then, setting the day, he got married (8) getting married, he now lived with her mother and father (9) then, that girl who was angry said to her father, "father, I really loved this young man; I was engaged to him, but he didn't marry me; he married another girl", she said (10) and then she said, "father, I am going to complain to a shaman; the shamans will 'put him right'; they get hold of souls; (I'll do that) so he will marry me", she said to her father (11) her father said, "go and complain if you wish; he will know; he will know what to do", he said (12) then, the girl went to a shaman to converse with him (13) conversing with him, she told him the following: "I was engaged to that young man, but he didn't want me, but married another; therefore, I want to get that young man back, to take her husband from that woman; I really want to live a married life; you get hold of his soul and win him for me" (14) when she said that, the shaman told her, "yes, I will get hold of his soul, and if I can't manage the business that way, I will knock him into the water with the river man; he will live in the water with devils, demons and sirens", he told her (15) then, the
girl said, "do that for me; I want to ruin him too, just as he
ruined me" (16) saying that, the girl left (him) (17) "do that
which I have asked you", she said (18) indeed that young man lived
with his father-in-law (19) living with his father-in-law, he
went to bathe (20) when he went to bathe, he didn't know what
they wanted to have done to him (21) huge waves pressed him
(22) he didn't know why; meanwhile, a river man appeared (23) he
said, "are you the young man Gabian?" (24) then, the young man
said, "yes, I am" (25) "now I will take you off; I have looked
everywhere for you; you must live with me under the water; I live
under the water; they call me the 'river man'" (26) then, the
young man said, "you are not going to take me off at all; now, I
will shoot and kill you; I've got my gun here to kill you"
(27) when he said that, the river man got scared and left him
(28) then he kept following him in this way; when the young man
went to bathe, waves would press against him (29) afraid, that
young man went and lived on the farm where there was no river
(30) he would bathe in a well, and his wife went to the river
(31) searching everywhere, the river man found him there (32) in
that place too, when he went to bathe, going to the water (in the
well), waves pressed against him in that way (33) water burst
from the middle of the well in great waves, and then the young man
was really scared (34) the river man wanted to pull him under water
there, but couldn't (35) then he said, to his wife, "now I won't
go to the water; the river man wants to take me off; he loves
me; he hates me; you bring water to the house for me to bathe; I
don't want to go to the water to bathe; put the jug on your head
and bring water" (36) when he said that, his wife indeed would
bring water so that he could bathe in the house (37) that young
man would bathe in the house (38) when he was saying these things,
meanwhile, he forgot and once more went to the well to bathe
(39) when he went again to bathe, searching everywhere, the river
man found him (40) huge waves pressed him, pulling him under
(41) with his hand, he bade farewell, "I'm going now, I'm going
now" (42) his wife said, "why are you leaving me, my little
Gabian? don't let them take you off - fly!" (43) when she said
that, Gabian, her husband, flew (44) he flew from the water once
more (45) flying, he arrived at her side (46) his wife took him
off to the house, hugging him (47) she was really happy, but really
scared as well (48) with the river man following him that way again,
the young man said, "now I shall live without bathing (49) but the
river man appeared in the jug, even in the jug (50) he wanted to
pull him under in the jug (51) the river man appeared in the jug
(52) then, afraid, he said, "now I shall not take water from the
jug; put water in the gourd for me to drink; I'm afraid to go
near the water-jug; the river man wants to pull me under in it"
(53) when he said that, his wife put water in the gourd every
meal-time (54) he would drink there (55) the river man did the same
thing there (56) the river man wanted to pull him under in the water-gourd (57) he made him live that way for a long time, following him, hating him, wishing to pull him under in the gourd (58) meanwhile, the river man stole the young man away; he pulled him under in the water-gourd (59) people didn't know where he disappeared to (60) his wife knew (61) he disappeared in the water-gourd (62) his wife went to her father and mother and told them, "father, your son-in-law has disappeared in the water-gourd; I don't see him; he was just eating, when I saw him disappear; he went under in the water-gourd; the river man took him off; the river man pulled him under; he stole him off; now he lives with them under the water; now indeed I have lost my husband; those despising women of his, those girl-friends of his have had this done to him / they have had him taken away, by going to complain to shamans, by going to tell things, by asking, by paying, they have had him taken away", she said (63) thus, that young woman remained once more husband-less (64) she had no husband (65) thus she lived too, broken in every way (66) she lived with father and mother, for she could not get married now; that's it.

3. /užku nasiktiN/

užku nasiktinši kai kaspi uakan / uarmi nasiktinka utkuši uakan / kaspi'uan utku uakaptinkši ku'ukan uižan kaspitaka / ama uakaiču ųukami paitaka biekš'iačiša / kaň uakanši kai užku nasiktin / maš iu'iai ųuka paita biekš'iačiša

"When man was born....."

When man was born, the tree cried, they say; when woman was born, the cotton cried; the cotton and the tree were crying, they say, when the grass told the tree, "Don't cry, I will make him grow old; you cry when man is born, but think on it - I will make him old".

4. /žuiču/

(1) suk pačaši uižarkan žuičuka sapota (2) sapoka uižarkan
"The Deer"

(1) Once upon a time, the deer told the frog (2) the frog told the deer (correction by the speaker), "hey, deer, let’s go and have a race" (3) the deer said, "alright, but you don’t run like me; I’ll leave you behind at running, frog" he said (4) the frog said, "come tomorrow and we’ll have a race; the winner passes four hills" (5) saying that, the frog looked for three helpers (6) the frog told his companions, "come now, let us place ourselves on each hill; I stay here; you go and wait on that other hill; you on the third hill, and you on the fourth hill; sit there and call out; that way, we’ll ruin the deer and beat him, and he will not equal us" (7) indeed, the next day, the deer said to the frog, "hey, frog, let’s go and run" (8) at that moment, the deer ran off ahead (9) the frog said, "I’ll come behind you calling" (10) "on every hill you will call to me" (said the frog) (11) then, arriving on the hill, he (the deer) called the frog - frog! (12) 'ko ko ko ko' (call of the frog) (13) "ay, damn you, I don’t leave you behind running" (said the deer) (14) then, he ran off once more (15) running, he arrived at the top of the hill, and called - hey, frog! (16) 'ko ko ko ko' replied the frog (17) "damn you, frog, I can’t leave you behind; you run pretty fast without getting tired... now you are tiring me out" (18) that was the second frog (19) he arrived on the third hill and once more he called - frog! (20) 'ko ko ko ko' (21) "ay, damn you, frog, now you’re killing me" (22) off he ran again, trying hard, but not running strongly; he ran up the slope, his mouth pure foam, his tongue hanging out (23) he could not run (24) on the fourth hill, he went and laid himself down to rest, that’s all (25) the deer died there (26) the frog won by placing themselves on the hills (27) the deer killed himself, running too hard, crossing barrancos.

5. /medikō/

(1) ti’iarkaN suk užku masi (2) ţaika uižarkaN tataNta / tata rinimi sasikuk xebërøspi / rinimi sasikuk / ţukapiš munanimi
medikū'iaita / sukamaNmi eNbīżani medikōkuna čupakuptInkuna /
pai kun a su kamaN ganaN karuta / su kamaN ganaN kužkita / čairakumi
ňukapiš rina'išani rina'išani sasikuk / xeberōšpi ti'iaN sukamaN
sinči medikōkuna / čaipina rina'išani iščakuk (3) niptIn tataNka
uižarkaN / rižai manaNmi ſukapuču kačaiki manaNmi ſukapuču obligaiki /
uižaiki rižai sasikumui nišpa (4) niptInka čai užku rirkaN sapaža
(5) sapaža nišpa xeberōšpi ča'iašpa patroNniNta maskarkaN
(6) patroNniNka uižarkaN maskaptInka / buenō sasikui ſuka čina
kanaikipa iu'ia'uanaikipa / ſuka čina alabo'uanaikipa / sukamaN
munadu kanaikipa / čaipimi xëNtškuna ratakuššuNka sinči runa kašpa /
saludaššuNka rimačiššuNkasapa munaduNkasapa tukui la'iata časšiNki /
pagaraššuNkasapa Zablōššikiraiku samainiššikiraiku (6) nišpa uižaptIn
deberas sasikurkan (7) paika sasikurkan iškai uatata (8) tataNpi
rikurimuρkaN kimsa uatamaNta su kamaN sinčiN medikō kašpa
(9) xeberōsmaNta ſukššikaptInka patroNniNka uižarkaN / rižai
tukui la'iata api (10) paika apirkaN pumata / paimi apirkaN sirona-
ta / paimi apirkaN iaku runata / pai apamurkaN iakumamaNta / kai
maNčakuikunata (11) sukamaN sinči runa karkaN (12) apamurkaN
kai piNšata (13) apamurkaN garsata (14) čaikuna karkaN ZabloNkuna
(15) čaimaNta šamuk / rirkaN kausak tataNpi (16) ča'iamušpa
uižarkaN / ſami tata sasikušškanimi / sukamaN padesšškani / iakami
uššušškani iarkaimaNta / tabaku'uanaN kausašškani / tabakutami sukamaN
upiašškani / sigaruta / kaššpušškani / ča'iaN kausašškani tata
sigaru kusniNuaN (17) niptInka tataNka uižarkaN / kunaN esika
Zupakūnq and aźičakuńpaikin ganai imańnaču sufrińkańki čańna čina
kannami kobrakunki (18) nįēpa uįżaptin deberas iačańpaka xentiñe-
kuna ratakuita kaŜarirkań (19) ratakuita kaSaariptin xentiñe-kuna
deberas įīpakurkana fabortonă rurarkań / aźiiačiksapa aipata
uarmi uźkuta (20) manań uarmiuiću karkań čai uainaka (21) čai-
mańta mediko kaptın sukamań munakuptin kuna kasararkań (22) kasar-
rańpa uźarkań tatańta / tata čami kasarańhkanimi (23) rinimi
ńukapiń čai kebrada anakpi čakerak kausak uį'uaukuk (24) niptınka
deberas čaiπi tatańka rosakuptınka pučukuita ianaparkańsapa
(25) ruraptınka ianaparkańsapa uasikuita (26) tarupckańsapa tukui
la'itä / plantuta / sarata / rumuta (27) pukuptınna rirkinča
čai uźkuka kausak uarmińuań (28) čata xentiñe-kunaka čaikamän
katirkanńa (29) karupipiń kaptın rișapa montoń xenti (30) čańna
atipačikuptın čai uainaka sukamań paits čiknimuksapa uazaga
partęmańta sukniń medikośi paipis śinći runa (31) uźarkań / ńuka-
mí esika apamuni čai žuža bruxōtaka / manańmi ńuka'uańka igualnacu /
manań fuersasiuk ńuka činaču kanńa / ńuka esika aśuan śinći runa
kani nįēpa rimaksapa (32) tantiöpi čai uainaka paipis śa disipulō-
iukna karkań / disipulōnkuna įįpakuń fabortonă rurak (33) čai
uainaka disipulōnkunata hakańpin śinći runata uĥunčik (34) uĥun-
čiptın manań iaćaksapaču uazaga partępi maipimi čai uainaka / ma-
mańta hakaśkana / rabiačiptın uĥunčiksapa nįēpa (35) čaimańta
sukamań čai uainaka maskačiksapa tukui maita kai mū'iůuairuńan
altōta azpata manań tariksapaču montoń padańeşpa (36) aipu sukamań
There was a man like me. He said to his father, "father, I am going to diet in Heberos; I am going to diet; I too want to become a shaman; I envy the shamans as they suck (poison-darts out); they earn a lot of money; therefore, I too want to go and diet; in Heberos, there are really strong shamans; I want to go there and learn." When he said that, his father said, "on you go; I don't send you for my own benefit, nor do I force you; I tell you, go and diet, if you wish." When he said that, the man went off alone. Going alone, he arrived in Heberos and looked for his chief. Having searched for his chief, he said to him, "fine, you diet so you may be like me, so they may think of you the way they think about me; so you may be praised like me; so you may be much loved; then, people will come to meet you, for you will be a strong man; they will greet you, they will make you pronounce, they will want you, and you will receive all kinds of things; they will pay you because of your devils, and because of the rest you give (them)." When the chief said that, indeed he dieted. He dieted for two years. After three years, he appeared before his father, a really strong shaman. As he was leaving Heberos, his chief said to him: "go and get hold of all kinds of things." He (the young man) got hold of the jaguar, he got hold of sirens, he got hold of the boa,
and the snakes (11) he was a really strong man (12) he brought that 'pinsha' (13) he brought the crane (14) these were his devils (15) then he came, and went to live with his father (16) arriving, he said, "I have dieted now, father; I suffered a lot; I almost died of hunger; I have lived on tobacco; I smoked a lot of tobacco, cigarettes; I smoked my pipe; I lived on that, yes on cigarette smoke" (17) when he said that, his father said, "now indeed, with your 'sucking' and curing people, earn just as much as you suffered; now it is you who collect (18) when he said that, indeed, when they knew, people began to meet him (19) when the people began to meet him, indeed he 'sucked' and helped them; he cured lots of men and women (20) that young man was not married (21) then, being a shaman, and with a great number of people who loved him, he got married (22) when he got married, he said to his father, "father, I am married now" (23) "I too am going to make a farm, to live and rear a family up this creek (24) when he said that, they helped him to clear the ground and to break it up (25) having done that, they helped him set up house (26) they sowed all kinds of thing - banana, maize, yuca (27) when the crop was ripe, that man went and lived there with his wife (28) then, the people arrived there (29) even when he was far off, lots of people would go to him (30) while he was curing people that way, another shaman from the Huallaga, who was a strong man too, began to hate him desperately (31) he said, "I'll certainly carry that green(young)witch off; he is not my equal; he will not be as strong as me; I'm a strongish man, I am" (32) meanwhile that young man also had his pupils; and his pupils 'sucked' and helped people (33) that young man bewitched his pupils and they killed the strong man (34) when they killed him, those from the Huallaga district didn't know where that young man was, or from where he had bewitched him; someone, getting angry, killed him, they said (35) then, they searched for that young man everywhere with a whirl-wind, high, on the ground, but they did not find him, even though they suffered a lot (36) they really searched a lot (37) one night, he(the young man)went to pass water; he did not live by a 'big water'(river); up a creek (38) it(or he?)did not run fast (39) below, he heard a boat, ploughing forward (40) the boat ploughed forward 'cha cha cha cha', like that (41) then, he went and said to his wife, "what could it be that is coming up this creek?; it is making a lot of noise as it comes (42) when he said that, his wife grew really scared (43) she said, "yes, now they kill us; it is looking for you; they want to take you off; they want to kill you; they want to put you in the water (44) when she said that, her husband said, "don't be sad; I know how we can save ourselves" (45) indeed, they heard it really close now (46) he began to chant (47) he said to his wife, "give me my pipe; give me my tobacco; give me my cinammon; I shall chant and smoke (48) saying that, he chanted all he knew (49) chanting, he smoked a lot (50) he smoked (51) the boat ploughed on (52) they were feeling the
house now, and making it shudder; they were feeling with a lot of wind, making the house shake (53) his wife began to cry a lot in fear, for they wanted to knock the house over, she said (54) then he said, "ah, devil, you want to take me away; you want to take me away, damn you, devil; you are a devil; a devil like me, 'pun', but now you will see", he said (55) by then, it was quite near, only fifty metres from their house (56) now they were feeling, and the ground was sinking (57) now they were dying, as the wind shook their house (58) he said to his wife, "ah, devil, now you take us away; devil, give me my gun (59) 'sum' I'll shoot that demon;' a devil comes to the boat; it is not really a boat;" he said, and shot (60) he shot his gun and, as he pulled the trigger, it went 'pa pa', two shots (61) the boat ploughed forward (62) then he loaded up quite a few shots (63) then he shot again (64) shooting again, he shot twice (65) he shot without seeing that boat (66) then he shot two more shots; he shot four shots (67) when he had shot, the boat, in fear, rushed down-stream (68) until now, they don't now where it went (69) what it was; who sent it to look for him (70) he knows, but others don't (71) in sleep, he dreams, and smokes; and smoking sees it; what is happening?; why am I dying? (72) that's the way he has lived until now; that's it.

SAMPLE OF PHONOLOGICAL FORM(SYSTEM B)

1. /aragan/

(1) ti'iarkan sug uarm kusauNaN kausaG ZaGrap (2) na ZaGraNguna karkaN pastuna (3) ZaGraN pasuNguna karkaN zauiNtalta (4) ti'iarkan iskai uauNguna / kimsa uzu uauNguna trabaxadorkuna (5) sai sug maioRka zsugzkika aragan likidu (6) manaN trabaxana'iagGou tataNuaN (7) tataNga sukaman asutG kapariG aragan kaBtiG (7) manaN kataina'iaBtiG ZaGramaN (8) zaipi uNguG tukun (9) manaN ni mikuG ratakouGou (10) mama tatan zurarupuG platuNta ladOnpi / manaN mikuna-iagGou araganNiiNuaN (11) simipN pi curapuBtiNga apiGpa mikuG / tragaG mizpuk (12) caimaNta ladOnpi curapuBtiNguna manaN mikuGou (13) manaN
apiita atipagů Zuža'uaN aragaNniNuaN (14) täimaNta čiGnirkaNsapa
manaN trabaxaita ianapaBtiNguna (15) kaNgimi sukamaN aragaN / maipina
rižai / uañumui / manaNmi ka'una'a'iaikisapanaču kai uasiinikuna ukupi /
manaN ni trabaxaita ianapa'uaNksapa Zužakušpami kaipi sirikuNgī ama
trabaxanaikipa nišpa (16) čašna uižaBtiNgunana taNtöpika čai aragaNga
čai Sa'uiNtalpi monton Sa'uiNtu karkaN (17) urmak monton uai'iu /
monton pukuna (18) täipina rirkaN sirīG (19) čai Sa'uiNtu sikiNpi /
čimiNta kicarišpa Su'iag / Sa'uitu urmaBtiN čimi ukupi mikunaNpa
(20) monton Sa'uiNtu urmak asta sa'uaNpi (21) manaN apišpa mikuita
atipagů (22) čimi ukupiča urmaBtiN mikuk (23) kada di'ia sug iškai
čimi urmaG (24) čaita mikuspa kausaG (25) taNtöpī tarirkan suk
sižuka (26) sižukaka / uañudu nišpa / ratakuG tuGsīG (27) tuGsīBtiN
sižuka ku'iuG (28) manačīG 'shuu' (29) niBtiNgā pa'uaG (30) pa'uaš-
paka ti'iariG sug ramači / täimaNta ka'uaG / täimaNta šata kaškaN
ratakug (31) kaškaN ratakuBtiN manačīG (32) manačīBtiN sakiG
(33) ka'iančiN riG čapag / čai pi tarīG (34) kaškaN ratakug / kada
tuGsīBtiN ku'iuG (35) sižuka pa'uarčaN sug ramači ti'iarīG / manaN
altöpiču (36) täimaNta sižukaka rimarkaN / buenō kai xēntēkunaka kai
ZaGtapī iakumaNtanami uañuna'iaN (37) manaN kai ZaGtapīka iaku ti'iaN
(38) sug rumi sikiNpi ti'iaN iaku (39) čai rumita polbōBtiNga esika
iaku pačiamaNmaN (40) aragaN sakirkaN (41) ti'iarčaN kai ZaGtapī
monton soldadō (42) uižag parlačīG rirkaN (43) onbrē kaitami šamuiki
uižak / ti'iaNši kai rarka naGpi iaku sug rumi sikiNpi / ku'uaN
soldadōkunata rinainipa čai rumita polbōG (44) niBtiN uižarkaN čai
(1) There was a woman, who lived with her husband on the farm (2) the farm was pasture land (3) it was pasture land, and they had a 'shawintu' orchard (4) there were two children; three boys were good workers (5) the eldest one resulted a complete lazybones (6) he did not want to work with his father (7) his father would beat him, for the boy, being a lazybones, made him angry (8) he would pretend to be ill (9) he didn't even come to eat (10) his mother and father would put the plate by his side for him, but he didn't want to eat, because he was lazy (11) when they put food in his mouth, he would grasp it and eat it; he would swallow it (12) then, when they put it by his side, he wouldn't eat (13) he couldn't grasp it in his laziness, in his sloth (14) therefore, everyone hated him, because he did not help in the work (15) "you're really lazy; go off somewhere!; go and die!; we don't want to see you inside our house; you don't even help with the work, but instead feign illness, and lie there so that you don't have to work" (16) when they said that, meanwhile, that lazybones was in the 'shawintu' orchard, where there was a great amount of 'shawintu' (17) lots of fruit was falling, lots of ripe fruit (18) he would go there and lie (19) at the foot of a 'shawintu' tree, waiting with his mouth open (20) lots of 'shawintu' fell even on top of him (21) he couldn't grasp them and eat them (22) when they fell right inside his mouth, he did eat (23) each day, one, or two would fall into his mouth (24) he would live by eating those (25) meanwhile, a vulture found him (26) the vulture said to himself - he's dead - and went up to him, and pricked him (27) when it pricked him, he moved (28) he scared it off 'shuu' (29) when he said that, it flew off (30) flying off, it sat on a branch; from there, it watched; then again it came to him (31) again coming to him, he scared it off (32) when he scared it off, it left him (33) the next day, it went
to spy on him, and found him there (34) again it came to him, but every time that it pricked him, he would move (35) the vulture flew and sat on a branch, not very high up (36) then, the vulture said, "well, the people in this town are about to die of thirst (37) there isn't any water in this town (38) but under a stone there is water (39) if you smash that stone, then water may well burst out"

(40) the lazybones left (the vulture) (41) in that town, there were lots of soldiers (42) he went to tell them, to speak to them (43) "hey, I come to tell you; they say that there is water up this creek under a stone; give me soldiers so that I can go and smash that stone" (44) when he said that, the lieutenant said, "fine, off you go, take thirty soldiers; but, if there isn't really water, we kill you" (45) the lazybones took the soldiers to smash the stone (46) indeed they smashed that stone (47) from the stone, from below the stone, indeed water burst out; it boiled like boiling water (48) pure water burst out and ran strongly (49) then, they gave that lazybones lots of money (50) he became rich, and getting rich, he worked (51) that way, there was water in that little town; that's it.
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