

THE PHONOLOGY OF SPOKEN IRAQI ARABIC  
FROM THE  
FUNCTIONAL POINT OF VIEW

ABBAS JAWDAT RAHIM

Thesis submitted in fulfilment of the requirements  
for the degree of  
Doctor of Philosophy

University of Leeds  
Department of Linguistics and Phonetics  
September, 1980

TO  
MY LATE MOTHER

## ABSTRACT

This thesis attempts to arrive at a phonematic analysis of Spoken Iraqi Arabic (SIA) based on theories of the functional school of linguistics. It falls into two parts:

PART ONE comprises six chapters and it presents an outline of functional linguistic theories with special emphasis on phonology. Chapter One deals with the historical background of functional linguistics with particular reference to F. de Saussure (the founder of modern linguistics), some principal members of the Prague School, and A. Martinet (the leading figure in neo-Praguian functionalism). Chapter Two treats of the notion of 'function' and the functions of language as viewed by F. de Saussure, K. Bühler, J.M. Kořínek, J. von Laziczius, N.S. Trubetzkoy, and A. Martinet. Chapter Three and Chapter Four explain some basic functional notions such as the phoneme, the relevant feature, phonemic content, variant, contrast, opposition, the archiphoneme, neutralization, and defective distribution. Chapter Five deals with various methods of 'phonemic diagnosis' (e.g. the commutation test) with particular reference to Trubetzkoy's rules for monophonematic or polyphonematic evaluation. Chapter Six classifies oppositions into 'distinctive oppositions' versus 'non-distinctive oppositions', and further presents 'logical' as well as 'phonological' classifications of 'distinctive oppositions'.

PART TWO comprises seven chapters and it presents an application of the functional phonological theory to SIA. Chapter Seven is an introduction giving an account of the Arabic dialect studied in this

thesis, the segmental and non-segmental notations used in this Part, the basic sound differences between CA (Classical Arabic) and SIA, and a critical survey of previous non-functional analyses of SIA. Chapter Eight tackles certain phonological problems in SIA, viz. 'təfxim', 'təfɔid', the phonological status of [j] and [w], [tʃ] and [dʒ], diphthongs, vowel length, and vocalic lip-posture (presenting previous views as well as my own views on them). Chapter Nine deals with the SIA phonemes and their realizations, showing the oppositions whereby each phoneme is phonetically realized. Chapter Ten defines each phoneme in terms of relevant features and then classifies the SIA phonemes into groups on the basis of their relevant features. Chapter Eleven provides tabular and multi-dimensional representations of the SIA consonant as well as vowel systems. Chapter Twelve presents a method for measuring the 'functional load' of each phoneme; it provides tables showing the number of distinctive oppositions that each phoneme forms with the other phonemes of the SIA phonological system in word-initial, word-medial and word-final positions followed by statistical conclusions as to which phonemes have the highest functional load in the system, and so on, and which of the three word positions is the position of maximum differentiation. Finally, Chapter Thirteen investigates cases of neutralization and cases of free variation. It also accounts for the archiphonemes which are said to occur in the position(s) of neutralization of the respective oppositions in addition to their relevant features and their symbolization.

ACKNOWLEDGEMENTS

This research has been conducted under the supervision of both the Department of Phonetics and the Department of Linguistics which have recently merged to form the Department of Linguistics and Phonetics. Therefore, I would like to thank all members of staff and fellow students who have, in one way or another, helped towards the completion of this thesis. My deep gratitude is due to my supervisors, Mr. T. Akamatsu and Mr. D. Barber, for their invaluable and most useful and efficient guidance throughout the preparation of this thesis, and for their readiness to see me and help with whatever problems I have encountered. It is through Mr. Akamatsu (of the former Department of Phonetics) that I was introduced to the functional theory during the Postgraduate Diploma course in Phonetics and subsequently became interested in this field of study. I have also consulted Mr. Akamatsu about matters of translation of certain French and German texts. I would also like to express my deep appreciation to Mr. Barber (of the former Department of Linguistics) who, in spite of not being a functionalist himself, worked very hard to acquaint himself with the literature on functionalism. I would like to thank him for his very useful and constructive comments and suggestions. I am also grateful to the Departmental secretaries for their continuous help and sympathy. My deep gratitude is also extended to Miss Ann Williams for her deep concern and sincere encouragement and also for typing part of this thesis in the early stages of my research. I would like to extend my sincere thanks to Mrs. Lola Myers

and Ms. Lorraine Winter for bringing this thesis to its final form. Special thanks go to Miss Beverley Lindley for being a great help in many respects. Last but not least, I would like to express my deep gratitude to the Iraqi Ministry of Higher Education and Scientific Research for granting me a five-year scholarship without which this thesis would never have come into existence.

A.R.

## ABBREVIATIONS

The abbreviations used in this thesis fall into the following three categories:

### (A) BOOKS

- LSP: The Linguistic School of Prague, by J. Vachek, Bloomington and London: Indiana University Press, 1966.
- PSRL: A Prague School Reader in Linguistics, compiled by J. Vachek, Bloomington, 1964 (third edition 1967).
- SW1: Selected Writings 1, by R. Jakobson, The Hague: Mouton & Co.; 1962.
- RAL: Readings in Arabic Linguistics, edited by S.H. Al-Ani, Bloomington, Indiana, 1978.

### (B) PERIODICALS

- AL: Acta Linguistica. Revue internationale de linguistique structurale, Copenhagen.
- BIFA0: Bulletin de l'institut français d'archéologie orientale, Cairo.
- BSL: Bulletin de la Société Linguistique de Paris, Paris.
- CFS: Cahiers Ferdinand de Saussure, Genève.
- ČMF: Časopis pro moderní filologii, Prague.
- FM: Le Français Moderne: Paris.
- IJAL: International Journal of American Linguistics, Baltimore.
- IUPAL: Indiana University Publications in Anthropology and Linguistics, Baltimore.
- JAOS: Journal of the American Oriental Society, Baltimore.
- J Psych: Journal de Psychologie normale et pathologique, Paris.
- JSS: Journal of Semitic Studies, Manchester.
- LSA: Studies in Linguistic Analysis, (special volume of the Philological Society), Oxford, Blackwell, 1957.
- TCLC: Travaux du Cercle Linguistique de Copenhague, Copenhague.

TCLP: Travaux du Cercle Linguistique de Prague, Prague.

TLP: Travaux Linguistiques de Prague, Prague.

(C) MISCELLANEOUS

CA: Classical Arabic.

IPA: International Phonetic Association (or Alphabet).

LCP: The Linguistic Circle of Prague.

MIT: Massachusetts Institute of Technology.

P 1st  
ICPS: Proceedings of the First International Congress of Phonetic Sciences (Amsterdam, 3-8 July, 1932), La Haye: Nijhoff, 1933.

P 2nd  
ICPS: Proceedings of the Second International Congress of Phonetic Sciences (London, 22-26 July, 1935), Cambridge, 1936.

P 3rd  
ICPS: Proceedings of the Third International Congress of Phonetic Sciences (Ghent, 18-22 July, 1938), Ghent, 1939.

P 7th  
ICPS: Proceedings of the Seventh International Congress of Phonetic Sciences (Montreal, 22-28 August, 1971), Mouton, 1972.

P 11th  
ICL: Proceedings of the Eleventh International Congress of Linguists (Bologna-Florence, 28 August-2 September, 1972), Bologna, 1974.

SIA: Spoken Iraqi Arabic.

UCLA: University of California, Los Angeles.

US(A): United States of America.



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## INTRODUCTION

This thesis is basically a phonematic analysis of the Arabic dialect spoken in Iraq. Phonematics, according to A. Martinet, "treats of the analysis of the utterance into phonemes, of the classification of these phonemes, and of the examination of their combinations in forming the significantia of the language."<sup>(1)</sup> The significantia of the dialect under investigation (i.e. the primary data for the present research) are SIA words. By 'word' is meant "an autonomous syntagm formed of non-separable monemes" (p.106). This designation also includes autonomous monemes such as /bet/ 'house' as well as non-autonomous monemes such as /min/ 'from', /'sələ/ 'on'. Since 'phonematics' is the main concern of this research, I shall not deal with 'prosody' in any detail. By 'prosody' is meant "all the facts of speech which do not fall within the phonematic framework" (p.75).

Of the various trends in phonological theory, the functional approach is the one adopted in this research. The functional theory presented and applied in this thesis is that of the Praguians and subsequently the neo-Praguians. More specifically, the views discussed and followed in this thesis

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(1) A. Martinet, Elements of General Linguistics, London: Faber & Faber Ltd., 1964, p.56 (translated by E. Palmer from the French original Éléments de linguistique générale, Paris, 1960). Throughout this thesis, page references are made to the English translation. In this introduction, further references to Elements...cit are given after quotations in the text.

are chiefly those of Trubetzkoy (a Praguian) and Martinet (a neo-Praguian), two of the most outstanding leading authorities on functional linguistics in general, and functional phonology in particular.

Since there is still a great deal of room for research on Arabic in general and SIA in particular, especially from a functional point of view, an outline of the functional theory has been contained in this thesis so as to constitute the foundation upon which the actual phonematic analysis will be based. To the best of my knowledge, the present research forms the first attempt at a proper functional analysis of the phonology of SIA, which, I hope, will initiate other attempts of this kind in the near future.<sup>(1)</sup> Therefore, I have decided to devote PART ONE of this thesis to the history and theory of functional linguistics which will provide the basis for the actual phonematic analysis of SIA which will constitute PART TWO of this thesis.

The aim of PART ONE of this thesis is to acquaint the reader with the Prague School; how it was established, its pioneering members, the theories it has adopted from F. de Saussure (the founder of modern, i.e. structural, linguistics)

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(1) As a matter of fact, the only available functional study concerning SIA is J. Cantineau's review of M.Y. von Wagoner's Spoken Iraqi Arabic. See BSL, 49/2 (1953), pp. 148-150. Cantineau is, in my opinion, the leading authority on the functional linguistics of Arabic (Classical as well as dialectal). Of his vast number of publications on Arabic linguistics and phonetics, see Études de linguistique arabe, Paris, 1960.



and Russian Linguistics, and its original contributions to linguistics as spelled out by its principal members (e.g. Trubetzkoy, Vachek, and Trnka). It also casts light on the views of neo-Praguians as represented by Martinet. In addition, it shows how Trubetzkoy and Martinet diverge in thought concerning some basic notions like 'neutralization' and 'archiphomene'. It also draws attention to the difference in theory and practice between functional linguistics and the other schools of structural linguistics (especially Jakobson's 'distinctive-feature theory').

The aim of PART TWO, on the other hand, is to apply the theories expressed in PART ONE to SIA so as to arrive at a functional phonological analysis. The method of research adopted in PART TWO is based on the application of the 'commutation test' to the data I have collected. The commutation test is applied to all the possible sounds (or combinations of sounds) as they occur in SIA words (native as well as loan words) in the three most common positions, namely word-initially, word-medially and word-finally. This test helps the researcher to establish a tentative phoneme inventory of the dialect studied. Once a phoneme inventory is established, each phoneme is defined in terms of 'relevant features' on the basis of the oppositions it forms with the other phonemes of the SIA phonemic system. Furthermore, the commutation test also helps to pinpoint the cases where certain oppositions never occur in certain positions (i.e. 'neutralization'), the cases where

certain phonemes never occur in certain positions (i.e. 'defective distribution'), and the cases where certain phonemes or variants of one and the same phoneme are used erratically without causing any meaning difference between the words concerned (i.e. 'free variation'). The commutative series implementing the commutation test also help to work out an important aspect of the individual SIA phonemes, viz. their 'functional load' which indicates the degree of distinctive utilization of the respective phonemes in the whole of the phonemic system as well as in the respective sub-systems (i.e. the consonant system or the vowel system as the case may be). It is obvious from what I have said above that 'opposition' is the essence of phonological existence. Therefore, the position (or context) where there occur more distinctive oppositions than in the other positions investigated is called the position of 'maximum differentiation'. This too has been investigated in this thesis. This thesis also studies some phenomena that play an important role in the phonology of SIA, e.g. 'təfxim' (commonly known as 'emphasis') and 'təjdid' (commonly known as 'gemination'), and whether or not they fulfil a distinctive function in the phonology of SIA.

PART ONE:

FUNCTIONAL THEORY

## Chapter One

FUNCTIONAL LINGUISTICS1.1. Historical Background

Functional linguistics is one of the various trends in 'structural linguistics' - the name given to 'modern linguistics' founded by the Swiss scholar F. de Saussure (1857 - 1913). In the 1920's there were highly encouraging conditions for establishing a structural linguistic school in Prague making use of both eastern and western linguistic trends coupled with the Czech tradition. As a result, the Prague School of Linguistics (usually referred to in French as Le Cercle Linguistique de Prague) was founded between the two world wars.

It is evident that the Prague School was influenced by Saussure's thought. Nevertheless, Saussure's thought was not, as some might think, the only source of inspiration for the Prague group; most of the inspiration came from Russian linguistics, and some of the Prague theories were, as we shall realize later, original developments. As far back as the 1880's, the Prague philosopher T.G. Masaryk had already stressed the significance of a synchronic description of language and had developed a theory of the teleological development of language. Though the Prague School and the other schools of structural linguistics had some features in common, they greatly differ in their principles and procedures. In order

to keep these various schools of structural linguistics distinct from each other, therefore, Prague linguistics, for example, was called 'functional linguistics'. V. Mathesius (the founder of the Prague School) was the first to use the name 'functional linguistics'.<sup>(1)</sup> The first serious step on the way to 'functional linguistics' was taken by V. Mathesius (1882 - 1945) shortly before 1920, when he worked out a synchronic, functional description of language. Having already seen the strong and weak aspects of the two scientific approaches in linguistics (current at the time), viz. the historical and the synchronic approaches, Mathesius tried to arrive at a synthesis of the good sides of both approaches, which later resulted in the establishment of 'linguistic characterology'.<sup>(2)</sup> The Russian influence on Prague linguistics was deeply felt with the arrival of the three famous Russian linguists: R. Jakobson (born in 1896), N.S. Trubetzkoy

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(1) Mathesius also used a purely functional definition of the phoneme from the start. In his "La structure phonologique du lexique du tchèque moderne", in A Prague School Reader in Linguistics (PSRL) compiled by J. Vachek (Bloomington, 1964, pp. 156 - 176), we read:

"Les matériaux de la phonologie consistent en des éléments phonologiques fondamentaux appelés phonèmes, c-à-d. des sons (simples ou composites) qui ont une valeur fonctionnelle et en des éléments phonologiques modificateurs, c-à-d. des qualités des sons (ou séries de sons) qui ont elles-mêmes une valeur également fonctionnelle".(p.157)

(2) See V. Mathesius, "On Linguistic Characterology with Illustrations from Modern English", in PSRL, pp. 59 - 67.

(1890 - 1938) and S.I. Karcevskij (1887 - 1955).<sup>(1)</sup> The Linguistic Circle of Prague (LCP) was established in October 1926 on the initiative of V. Mathesius, who became its President. Among the founding members (besides Mathesius, Jakobson, Trubetzkoy and Karcevskij) were B. Trnka (born in 1895) and B. Havránek (1893 - 1978). Among the others who contributed to the Circle's activities were J.M. Kořínek (born in 1899), J. Vachek (born in 1909), L. Novák (born in 1908), A.V. Isačenko (1911 - 1978), J. Krámský (born in 1913) and F. Daneš (born in 1919). Furthermore, among the foreigners who contributed to the Circle's publications were the Dutchman A.W. de Groot, the Austrian philosopher and psychologist K. Bühler, the Yugoslav A. Belić, the Englishman D. Jones, and the French linguists L. Tesnière, É. Benveniste and A. Martinet. Prague phonology was spread all over Europe by the efficient and vigorous efforts of the most creative and dynamic members of the LCP, namely Trubetzkoy and Jakobson.

In 1928, the First International Congress of Linguists was held at the Hague, and a year later the First Conference of Slavic Philologists was held in Prague. At the Conference, the very first volume of the Circle's official publication, Travaux du Cercle Linguistique de Prague (TCLP), was presented. It

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(1) Karcevskij was influenced by Saussure and that is how Saussure's distinction between 'langue' and 'parole' and his emphasis on 'associative relations' (now generally substituted by 'paradigmatic relations' because of the psychologistic implications inherent in Saussure's term) became important to Prague phonology as we shall see later.

included nine theses which expressed the Circle's interests and desired lines of research in Slavic linguistics. At the same Conference, Jakobson presented his Remarques,<sup>(1)</sup> which was the first attempt towards an explicit discussion of the problem of diachronic phonology within the Prague conception of the term. In 1930, an International Conference of Phonology was held in Prague. The contributions to this Conference as well as a "projet de terminologie phonologique standardisée"<sup>(2)</sup> which the participants had agreed on, appeared in TCLP 4 (1931). On this occasion an International Association for Phonological Studies was established and its constitution was approved at the Second International Congress of Linguists (Geneva, 1931). In 1932, the first meeting of the Association coincided with the First International Congress of Phonetic Sciences held in Amsterdam.

The LCP worked very actively until Hitler occupied Czechoslovakia and Austria during which time the Circle lost its best members. Trubetzkoy died of a heart attack in 1938. Jakobson on the other hand, fled to Denmark in the spring of 1939 and later to Norway, but he had to flee further to Sweden when the Germans occupied Norway. In 1941, Jakobson left Sweden for the U.S.A. where he obtained a position at Columbia University in New York,

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(1) R. Jakobson, Remarques sur l'évolution phonologique du russe comparée à celle des autres langues slaves, (= TCLP, 2, 1929).

(2) TCLP, 4, 1931, pp. 309 - 323.

and later became Professor at Harvard and M.I.T. Furthermore, Mathesius, the Circle's President, died in 1945 and the Circle was dissolved in the early fifties. Nevertheless, the Prague tradition was adopted by the Linguistic Association and the Group for Functional Linguistics at the Academy. The co-operation between these two organizations resulted in a new Prague publication called Travaux Linguistiques de Prague (TLP) which first appeared in 1964. From then on, the Prague tradition has been carried on by B. Trnka and J. Vachek and to a large extent by the neo-Praguians, i.e. A. Martinet and his followers. The neo-Praguians' contributions to functional linguistics are mainly contained in their journal La linguistique which has recently become the official organ of the International Society of Functional Linguistics.<sup>(1)</sup>

Although there are plenty of books and articles on the Prague School; history and theory, Trubetzkoy's Grundzüge der Phonologie (= TCLP, 7, Prague, 1939) has been and will remain the chief statement of Prague phonology. On the other hand, Martinet's Éléments de linguistique générale (Paris, 1960) expresses the basic notions of neo-Praguan functional linguistics. The ideas of Trubetzkoy and Martinet will be the main concern of this and the following chapters.

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(1) The formation of an International Society of Functional Linguistics was proposed and adopted on the second day of the Third International Colloquium of Functional Linguistics (Saint-Flour, 30th June-3rd July 1976), and the participants expressed their wish that the journal La linguistique should be made the official organ of the proposed Society. Consequently, a provisional committee, composed of Jeanne Martinet, Georges Mounin, Jan Mulder, Don G. Stuart, Andrée Tabouret-Keller and Henriette Walter, was formed to



## 1.2 Theoretical Background<sup>(1)</sup>

Although Trubetzkoy and many members of the LCP were interested in a wide variety of literary and cultural subjects, phonology seemed to be their main concern and their influence on it was felt to be more than on any other field; so much so that sometimes people mean by 'Prague School theories' simply its 'phonological theories'. But we must not forget that the Circle's interests were phonology, grammar as well as structural literary analysis. The theories of the LCP are best represented in the scientific contributions of its members, especially its official publications, the most important of which is TCLP (1929-1939).<sup>(2)</sup>

At the First International Congress of Linguists (The Hague, 1928), Jakobson presented the theses<sup>(3)</sup> which made the LCP known abroad for the first time. According to these theses, the

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contd. from previous page: ... pave the way for putting this proposition into effect. These scholars' efforts resulted in the establishment of the proposed Society with its headquarters at the École Pratique des Hautes Études, the Sorbonne, 47, rue des Écoles, 75005 Paris. For details see La linguistique, 13/1, 1977, pp.5f.

(1) The account in this section is only a brief statement of the theory and general pattern of the LCP. For a detailed account, see the following sources in particular:

(a) J. Vachek, PSRL (1964), and The Linguistic School of Prague (LSP), Bloomington and London: Indiana University Press, 1966.

(b) J. Krámský, The Phoneme, München, 1974, and

(c) Eli Fischer Jørgensen, Trends in Phonological Theory, Copenhagen, 1975.

(2) G.C. Lepschy's statement that TCLP appeared during the period 1929-1938 (see his Survey of Structural Linguistics, London 1970, p.54) is mistaken, since the eighth (i.e. last) volume of TCLP entitled Études phonologiques dédiées à la mémoire de M. Le Prince N.S. Trubetzkoy appeared in 1939 (the seventh volume being Trubetzkoy's Grundzüge..., 1939).

(3) See R. Jakobson, S. Karcevskij and N.S. Trubetzkoy, "Propositions" Actes du Premier Congrès International de Linguistes, The Hague 1928.

phonological theory should satisfy the following: (1) (a) setting phonological systems, (b) accounting for the significant differences between sounds, (c) finding correlations, i.e. oppositions like p/b, b/d, k/g. (2) (d) working out general laws concerning the structure of phonological systems, and (e) accounting for historical change which presupposes a teleological development of the system. The theses were jointly signed by Jakobson, Karcevskij and Trubetzkoy. Trubetzkoy later elaborated these ideas in a series of articles, some of which appeared in TCLP.

Particularly important, too, is the first volume of TCLP (1929) which contained the afore-mentioned nine theses, the collective work of the LCP. The first three of these theses reflected the Circle's interests, and the following six theses were an indication of desired lines of research in Slavic Linguistics. In 1930, as mentioned before, an International Conference of Phonology was held in Prague and on that occasion an International Association for Phonological Studies was established with affiliated circles throughout Europe. Subsequently, the Prague

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contd. from previous page: (Part of this collection of propositions is included in Jakobson's SW, 1, pp.3 - 6).

(1) See Eli Fischer-Jørgensen, Trends in Phonological Theory, Copenhagen, 1975, p.20.

(2) In her Trends..., 1975, p.20, Fischer-Jørgensen wrongly calls these 'contrasts'. I say 'wrongly' because 'contrast' (in the Praguian sense of the term) can only refer to syntagmatic relations whereas the relations between each pair of phonemes quoted is supposed to be paradigmatic and so it must be called 'opposition' instead of 'contrast'. For details on the difference between 'contrast' and 'opposition', see 4.1. of this thesis.

theories became the subject of lively discussions in many parts of Europe. As a result, they were accepted by a good number of linguists from different parts of the world (mainly the Continent) such as A.W. de Groot and W. van Wijk (from Holland) and A. Martinet (from France). Besides, the Swede B. Malmberg was strongly influenced by the Prague School, but at the same time he was influenced by the Copenhagen School (i.e. glossematics) and so cannot be considered a true Praguian.

As mentioned earlier, the LCP dealt with a wide variety of linguistic aspects and problems. For instance, the Circle made use of and elaborated Saussure's distinction between 'langue' and 'parole'. The study of sounds of 'langue' is, according to Praguians, phonology and the study of sounds of 'parole' is phonetics. Furthermore, the LCP maintained the parallelism between 'phonology'/'phonetics' and 'form'/'substance'.<sup>(1)</sup> Prague phonology also made use of the dichotomy 'syntagmatic'/'paradigmatic' which was later associated with 'contrast'/'opposition' as we have already noted. The Circle concentrated on language development in the phonological description of language and so LCP operated with the dichotomy 'synchrony'/'diachrony'

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(1) As we shall see later, the parallelism between 'phonology'/'phonetics', 'form'/'substance' and 'Sprachgebilde'/'Sprechakt' (the last two terms are Trubetzkoy's) is controversial. See Fischer-Jørgensen's Trends..., pp. 22f and Vachek's LSP, pp. 19ff.

but the Praguians stressed the fact that "synchrony should not be identified with statics".<sup>(1)</sup> Another aspect of Prague theory is that it treats language as a 'system of systems'. The definition of language as 'a system of systems' was tackled by the Soviet academician V.V. Vinogradov in a lecture given in Prague in 1957. But this dictum briefly summarized what Prague linguists (especially Mathesius) had felt since the late twenties. This was manifested in one of Mathesius's statements contained in his Czech paper on the phonological structure of Modern English (1929).<sup>(2)</sup> Prague phonology also treats of the two faces of the linguistic sign, viz. 'signifiant' and 'signifié'.<sup>(3)</sup> Being functionalists the Prague School members often talked about the functioning of language in terms of communication, representation, expression and appeal.<sup>(4)</sup> In connexion with the Prague theories, one may also come across the so-called 'function

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(1) J. Vachek, LSP, p.27. See also V. Mathesius, "O potenciálnosti j evů jazykových", Věstník Král české společnosti nauk, třída filosoficko-historická, (Prague, 1911), (English translation "On the Potentiality of the Phenomenon of Language", in PSRL, pp. 1-32). In this article Mathesius uses the expression "from 'statics' to 'dynamics'" to mean, and this he puts in brackets, "from synchrony to diachrony". Furthermore, Wade Baskin, in his translation of Saussure's Cours... uses the terms 'static linguistics' or 'language-states' ('étas de langue') to refer to 'synchronic linguistics'. We read: "Synchrony and diachrony designate respectively a language state and an evolutionary phase" (Course, p.81). In addition, the terms 'static' and 'historical' (or even 'evolutionary') are used in Course as alternatives to 'synchronic' and 'diachronic' respectively. (See Course... pp.81, 101, 140f).

(2) See V. Mathesius, "K fonologickému systému moderní angličtiny", ČMF, 15 Prague, 1929, pp. 129-139.

(3) For details see Vachek, LSP, pp. 30ff.

(4) On the different functions of language, see Chapter Two of this thesis.

of the structure of functions' dealt with by P.N. Bogatyrev in 1937. (1)

In brief, therefore, a Praguian phonological analysis of language, which is the main concern of this thesis, treats of phonemes, their relevant features (paradigmatics), their combinations in words and sentences (syntagmatics) and, furthermore, it treats of prosodic facts such as intonation, tones and accents.

### 1.3. Phonology and Phonetics

The distinction between 'phonetics' and 'phonology' is generally associated with the distinction between 'sound' and 'phoneme'. (2) From the standpoint of the Junggrammatiker (i.e. the Leipzig School of Linguistics), sounds are considered as purely physical (i.e. acoustic and physiological) phenomena. Other standpoints consider sounds as simultaneously physical and mental aspects (i.e. as psycho-physical facts). Prague linguists would, in my opinion, be in favour of the former point of view which is represented by J. Baudouin de Courtenay's conception of 'sound' as a purely physical phenomenon and of the

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(1) See P.N. Bogatyrev, "Funkcie Kroja na Moravskom slovensku," Spicy Ná roolopisného Odboru Matice Slovenskej, 1. For an account of this work, see LSP, pp. 36ff.

(2) On the distinction between 'sound' and 'phoneme', see V. Brøndal, "Sound and Phoneme" in P.2nd ICPS (Cambridge, 1936), pp. 40 - 45.

'phoneme' as a mental concept.<sup>(1)</sup> Baudouin de Courtenay, therefore, was the first to make a distinction between two kinds of sound study: 'physio-phonetics' and 'psychophonetics', "a terminology subsequently criticized and later replaced by 'phonology' and 'phonetics' respectively."<sup>(2)</sup> Saussure, on the other hand, makes the following distinction between 'phonology' and 'phonetics' (see Course..., p.33):

"The physiology of sounds (German Laut - or Sprachphysiologie) is often called phonetics (French phonétique, German Phonetik). To me this name seems inappropriate. Instead, I shall use phonology. For phonetics first designated - and should continue to designate - the study of the evolutions of sounds. Two absolutely distinct disciplines should not be lumped together under the same name. Phonetics is a historical science; it analyses events and changes, and moves through time. Phonology is outside time, for the articulatory mechanism never changes."

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(1) Baudouin (a pioneer of phonology) developed this concept in his Russian inaugural lecture. Although this lecture was published, it remained inaccessible to most European linguists primarily because it was written in Russian. See R. Jakobson, "Jan Baudouin de Courtenay", in Slavische Rundschau, 1, 1929, pp. 809-812 (esp. p.810)- reprinted in Portraits of Linguists, edited by T.A. Sebeok, 1, Indiana University Press, 1966, pp. 533-537.

(2) Christiane A.M. Baltaxe, Trubetzkoy and the Theory of Distinctive Features (Ph.D. Thesis), University of California, Los Angeles (UCLA), 1970, p.73; published under the title Foundations of Distinctive Feature Theory, Baltimore, 1978.

Saussure goes on to say:

"The two studies are distinct but not opposites. Phonetics is a basic part of the science of language; phonology... is only an auxiliary discipline and belongs exclusively to speaking...". (ibid)

The term 'phonology' was first used in its new Praguian sense in the first two volumes of TCLP which appeared in 1929. K. Bühler's article on phonetics and phonology (in TCLP, 1, 1929<sup>(1)</sup>) was referred to by B. Malmberg. Malmberg says that "Bühler considers phonetics to be as dependent on phonology... as phonology is on phonetics".<sup>(2)</sup>

As mentioned before, an International Association for Phonological Studies was founded in 1930 with Trubetzkoy as its President. At the Second International Congress of Linguists (Geneva, 1931), a plenary session was devoted to phonology for the first time. Furthermore, in the opening speech of the First International Congress of Phonetic Sciences (Amsterdam, 3-8 July, 1932), J. van Ginneken stated that phonology is "the crowning of the whole work".<sup>(3)</sup> That is to say, phonology synthesizes

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(1) This is apparently a mistake on Malmberg's part since Bühler's article on phonetics and phonology appeared in TCLP, 4, 1931, pp.22-53.

(2) B. Malmberg, New Trends in Linguistics, Stockholm, 1964, p.208.

(3) J. van Ginneken, "La tendance labiale de la race méditerranéenne et la tendance laryngale de la race alpine", in P.1st ICPS, La Haye: Nijhoff, 1933, pp.76-130 (esp. p.106f).

the results of all phonetic sciences. Phonology had quickly established itself as an important part of linguistic studies. In twentieth-century linguistics, phonology has proved to be particularly fruitful and this is mainly due to the work of the LCP. The Circle wanted to establish a new branch of linguistics called 'phonology'; so much so that it would be independent of 'phonetics'. This arose from Saussure's distinction between 'langue' and 'parole' accepted by the Prague linguists. To present the problem more clearly, one has to refer to the definitions of the terms 'phonology' and 'phonetics' as given in the Circle's "Projet..." (1931):

"Phonologie... - Partie de la linguistique traitant des phénomènes phoniques au point de vue de leurs fonctions dans la langue....

Phonétique... - Discipline auxiliaire de la linguistique traitant des phénomènes phoniques du langage, abstraction faite de leurs fonctions dans la langue." (p.309)

This distinction was accepted by Trubetzkoy in his Principles.<sup>(1)</sup> He made the distinction even sharper when he maintained that 'phonetics' is a 'mere' natural science, auxiliary to linguistics, while he granted 'phonology' the much more respectable status of a part of linguistics. He also adopted Saussure's dichotomy

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(1) See N.S. Trubetzkoy, Principles of Phonology, Berkeley and Los Angeles: University of California Press, 1969, pp.5ff. (Baltaxe's English translation of Trubetzkoy's German original Grundzüge..., 1939).



'form'/'substance' (now corresponding to 'function'/'physical phenomena') for which Trubetzkoy used the terms 'Sprachgebilde'/'Sprechakt'. Moreover, Trubetzkoy equated 'Sprachgebilde'/'Sprechakt' with Saussure's 'langue'/'parole'.

Jakobson, on the other hand, did not fully accept the formulation given in "Project". In his 1939 paper<sup>(1)</sup>, he rejected the parallelism between 'phonology'/'phonetics' and 'Sprachgebilde'/'Sprechakt' because, he believed, the phoneme must also be realized in speech performance. But, on the other hand, he accepted the parallelism between 'phonology'/'phonetics' and 'form'/'substance'. In the above paper, we read (trad. A.R.):

"The relation between the phoneme study and in general phonology, on the one hand, and phonetics on the other, is in no way parallel to the relation between the study of 'langue' ('Sprachgebildelehre') and the study of 'parole' ('Sprechhandlungslehre') but is parallel to the relation between the study of 'form' and the study of 'substance'." (p.310)

The separation between 'phonology' and 'phonetics' is still an open question. This separation was criticized by many scholars such as E. Zwirner (in his 1939 article)<sup>(2)</sup>

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(1) The paper was read at the University of Copenhagen in 1939, but was first published in 1962 in Jakobson's SW, 1 (pp.280-310) under the title "Zur Struktur des Phonems".

(2) See E. Zwirner, "Phonologie und Phonetik", AL, 1, pp.29-47.

Fischer-Jørgensen (Trends..., 1975) and A. Martinet (in 1949)<sup>(1)</sup> who conceives of 'phonology' as 'functional phonetics' which is in line with the actual practice of the Prague phonological theory. In his later writings, Jakobson adopted Martinet's conception of phonology as 'functional phonetics' and used it to bridge the gap between phonology and phonetics (which he had emphasized in his early writings) in his theory of 'distinctive-feature analysis'. However, Vachek (a leading figure in Praguian linguistics) maintains that phonology and phonetics should be separate sciences, although he admits that "their mutual relation is much more complex than the radical line drawn in the early twenties was likely to reveal".<sup>(2)</sup>

#### 1.4 F. de Saussure

F. de Saussure (the founder of modern linguistics) was born in Geneva in 1857, a year after Sigmund Freud (the founder of modern psychology) and a year before Emile Durkheim (the founder of modern sociology). Son of an eminent naturalist, Saussure was educated in Geneva and spent a year at the University before moving to Leipzig to study with the Junggrammatiker, the most active school of linguists and philologists at that time. In

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(1) See A. Martinet, Phonology as Functional Phonetics, London: Oxford University Press, 1949, reprinted 1955, 1974. (Three lectures delivered at the University of London in 1946).

(2) J. Vachek, LSP, p.43. In this connexion, Vachek refers to Trnka's Czech paper entitled (trans.) "On the Present State of Phonological Studies", in Slovo a Slovesnost, 6, Prague, 1940, pp. 164 - 170 and pp. 203 - 215.

1878 the Swiss scholar published his brilliant Mémoire<sup>(1)</sup>, and was awarded his doctorate a year later. From 1881 - 1891 he taught grammar and comparative philology at the 'École pratique des hautes études in Paris', and served as Secretary of the Linguistic Society of Paris. In 1891 he was recalled to the University of Geneva where he was named Professor of Indo-European Linguistics and Sanscrit in 1901. From 1907 until his death in 1913 he was also named Professor of General Linguistics.

It was only after his death (1913) that Saussure's insights were made accessible to an audience larger than the circle of his own students. In 1916 C. Bally and A. Sechehaye published an elaboration of the lecture notes taken by several of Saussure's audience at three courses held between 1906 and 1911. This publication which was entitled Cours de linguistique générale<sup>(2)</sup> has been and will always be considered as Saussure's masterpiece. In his Cours, Saussure defines those distinctions that have provided the basis for all subsequent linguistic studies. These distinctions are best summarized by a series of dichotomies

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(1) F. de Saussure, Mémoire sur le système primitif des voyelles dans les langues indo-européennes, Leipzig, 1878 (reprinted in Recueil des publications scientifiques de Ferdinand de Saussure, Genève, 1922).

(2) F. de Saussure, Cours de linguistique générale (edited by C. Bally & A. Sechehaye in collaboration with A. Reidlinger), Paris-Lausanne, 1916 (Wade Baskin's English translation - Course in General Linguistics, New York, 1959). Tullio de Mauro has published a critical account (Paris, 1973). In 1957, R. Godel published a very important book on the manuscript sources of the Cours, and in 1967, R. Englar began the publication of a monumental critical edition of the Cours.

such as 'synchrony'/'diachrony', 'langue'/'parole' (i.e. language /speech or speaking), 'paradigmatics'/'syntagmatics', 'signifiant'/'signifié' (i.e. significans/significatum or signifier/signified), and 'form'/'substance', and by notions such as the arbitrary character of the 'linguistic sign'.

### 1.5 Principal Members of the Prague School.

This section presents a biographical account of those members of the Prague School who contributed most to the Prague theories.<sup>(1)</sup>

(a) V. Mathesius (1882 - 1945) was a Czech linguist who was born in Pardubice (Bohemia) and studied at Caroline University in Prague. There he became lecturer in 1909 and Professor of English in 1912. He was interested in English literary history as well as general linguistic problems. He was pioneer of the synchronic approach to language study. He worked out the so-called 'linguistic characterology'. Until his death, he was President of the Linguistic Circle of Prague (LCP). Most of all, he was the founder of the LCP.

(b) S.I. Karcevskij (1887 - 1955) was a Russian linguist who studied at Geneva and so he was strongly influenced by the ideas of the Geneva School of Linguistics. In the mid-twenties, he lived in Prague and became closely associated with the Prague School. After 1928 he was Director of the Institute of Slavic Studies in Geneva and Professor at Geneva University.

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(1) This account is based on "Appendix 1" to Vachek's LSP (1966, pp. 122-136), where the main works of the respective scholars are given.

He was one of the founding members of the LCP.

(c) R.O. Jakobson (born in 1896) is a Russian linguist who was born in Moscow and was strongly influenced by the Russian linguistic schools of Baudoin de Courtenay, F.F. Fortunatov, and L.V. Ščerba. He came to Prague in the early twenties. He became Professor at Brno University (1933 - 1939), but he had to leave Czechoslovakia at the time of Nazi occupation. In the U.S.A. he became Professor of Slavic Languages at Harvard University and Professor of General Linguistics at M.I.T. Apart from being interested in linguistics and the theory of literature he was also inspired by modern painting and architecture.<sup>(1)</sup>

In linguistics he was mainly interested in phonology, problems of structural grammar and the development of child speech. He was one of the founding members of the LCP and its first Vice-President. At the First International Congress of Linguists (The Hague, 1928), Jakobson drafted the "Propositions" which made LCP known abroad for the first time. Surprisingly enough, Jakobson is no longer a member of the Prague School for he switched to a new trend of phonological description called 'distinctive-feature analysis'. He is now retired.

(d) N.S. Trubetzkoy (1890 - 1938) was a Russian linguist who was born in Moscow and studied at the University of Moscow and the University of Leipzig<sup>(2)</sup>. His scientific career started

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(1) See Fischer-Jørgensen, Trends..., 1975, p.20.

(2) See Appendix III "Autobiographical Notes on N.S. Trubetzkoy", in Trubetzkoy's Principles..., 1969, pp.309 - 323 (related by R. Jakobson).

at the age of fifteen and before leaving school he had already written a number of articles on ethnography. He later studied Philosophy and Linguistics. He was Professor of Slavic Philology in Rostov, Sofia and Vienna. He was an indirect victim of the Nazi occupation of Czechoslovakia. He was a friend of Jakobson's and shared his interest in the development of the phonological pattern of language. This made him a distinguished member of the LCP, and one of its founding members. He was also President of the International Association for Phonological Studies (founded in 1930).

(e) B. Trnka (born in 1895) is a Czech linguist who was born at Kletečná near Humpolec (Bohemia) and studied in Prague under V. Mathesius. In the mid-twenties he was appointed lecturer and in the early thirties Professor of English at Caroline University in Prague. He is mainly interested in phonology, structural morphology and syntax. He was one of the founding members of the LCP and its long-time Honorary Secretary.

(f) J. Vachek (born in 1909) is a Czech linguist who was born in Prague and studied at Caroline University (in Prague) under V. Mathesius and B. Trnka. After World War II, he was appointed lecturer and, in 1947, Professor of English at Brno University. He has been Senior Research Worker at the Institute of the Czech language of the Czechoslovak Academy of Sciences since 1962. He is mainly interested in general and historical phonology of English and Czech, structural grammar of English and Czech, and the theory of written language. He has been a leading member of the LCP since before the war.

### 1.6 A. Martinet

A. Martinet was born on 12 April 1908 in Saint-Alban-des-Villard (Savoie). He studied at the 'École pratique des hautes études', the 'Faculté des lettres de Paris', and the University of Berlin. He took his degree in the field of Germanic Linguistics. For his Ph.D. degree, he produced two theses: (a) La gémination consonantique-d'origine expressive dans les langues germaniques (Copenhagen, 1937) and (b) La phonologie du mot en danois (Paris, 1937, and in BSL, 38/113, 1937, pp.169-266). In 1938 Martinet was appointed Director of Studies at the 'École pratique des hautes études'. From 1946 to 1948 he was Director of the International Auxiliary Language Association in New York. From 1947 to 1955 he was Professor of Linguistics and Head of the Department of Linguistics at Columbia University in New York. From 1955 until his retirement in 1978 he was Professor at the Université René Descartes (Paris V), as well as Director of Studies at the 'École pratique des hautes études'. In addition, he is a member of (a) The Royal Academy of Denmark, (b) the Academy of Sciences of Finland, (c) the Academy of Sciences of Norway and (d) The Royal Society of Letters in London. From 1966 - 1967, furthermore, he became President of the European Society of Linguistics.

A. Martinet is a figure of great prestige in the development of contemporary linguistics. He is a true functionalist and, as I have mentioned earlier in this chapter, I consider him and his group (e.g. G. Mounin, E. Buyssens, T. Akamatsu) as neo-

Praguians since Martinet made some very interesting contributions to the elaboration of Prague theories such as the theory of 'neutralization and archiphoneme'. Martinet spread the knowledge of his phonological theories through his writings<sup>(1)</sup> and his teaching as holder of the first Chair of Phonology at the 'École pratique des hautes études' in Paris. Whilst teaching at Columbia University, furthermore, he was "one of the driving forces of the Linguistic Circle of New York and of its journal, Word, on which he impressed, in the first years of its life, an identifiable stamp which gave it an original place in the field of American linguistics."<sup>(2)</sup> He also presented a summary and at the same time a very acute criticism of Hjelmslev's theories of 'glossematics'.<sup>(3)</sup>

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(1) See for example (a) Martinet, "La phonologie", FM, 6, 1938, pp. 131 - 146, and (b) Martinet, "Où en est la phonologie?", Lingua, 1, 1947, pp. 34 - 58 (partly reprinted in Martinet's La linguistique synchronique: études et recherches, Paris: Presses Universitaires de France, 1965, pp. 59 - 76).

(2) G.C. Lepschy, A Survey of Structural Linguistics, London: Faber and Faber, 1970 (reprinted 1972), p. 103.

(3) See A. Martinet, "Au sujet des fondements de la théorie linguistique de Louis Hjelmslev," BSL, 42/124, 1942 - 5, pp. 19 - 42, which is a summary and critical discussion of L. Hjelmslev's Omkring sprogteoriens grundloeggelse, København, 1943 (English translation by F.J. Whitfield, Prolegomena to a Theory of Language, Supplement to IJAL, 19/1, Baltimore, 1953 - revised edition, 1961).



Martinet's interests cover a wide range of linguistic aspects, e.g. synchronic phonology, diachronic phonology, syntax and general linguistics.<sup>(1)</sup> Of all his interesting theories, the theory of 'double articulation'<sup>(2)</sup> is most original and famous. According to this theory, language is doubly articulated. On the one hand, the first articulation of a linguistic utterance analyzes human experience into monemes which are two-faced units -monemes have an expression (or vocal form), i.e. 'signifiant', and a content (or meaning), i.e. 'signifié'. The second articulation, on the other hand, analyzes the signifiant of monemes (i.e. the outcome of the first articulation) into phonemes and tones and accents. In other words, the second articulation only affects the expression (i.e. the 'signifiant') of a linguistic utterance. Martinet's other phonological theories and notions will be dealt with later in this thesis.

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(1) On 'diachronic phonology' see, for example, Martinet's Économie des changements phonétiques: traité de phonologie diachronique, Switzerland, 1955; on 'synchronic phonology' see for example his La linguistique synchronique...cit; on 'syntax' see for example his Studies in Functional Syntax, München, 1975; and on 'general linguistics' see for example his Elements...cit.

(2) On Martinet's theory of 'double articulation' see for example his "La double articulation linguistique", TCLC, 5, 1949, pp. 30-37, and his "Arbitraire linguistique et double articulation", CFS, 15, 1957, pp. 105 - 116 (both articles are reprinted with some modifications in his La linguistique synchronique...cit, pp.11 - 35). See also his Elements...cit, pp.22ff.

## Chapter Two

FUNCTIONS OF LANGUAGE2.1. Introduction

Before going into any details concerning the various functions of language, I wish to emphasize the fact that 'function' is a key notion in the theories of Praguian; and neo-Praguian; linguistics (i.e. functional linguistics, in general). As mentioned before, Mathesius gave a purely functional definition of the phoneme as early as 1929.<sup>(1)</sup> In addition, Trnka<sup>(2)</sup> talks about the 'true function of phonemes' which is, according to him, only distinguishing phonemes from one another and not showing word meaning difference. He also states that most members of the LCP emphasized the 'functional' role of language which is conceived of as a system representative of the linguistic community's needs for communication and expression, and so is bound to undergo change to account for new needs. This reveals, though roughly, the importance that the Prague linguists attach to 'function' in their phonological theory in particular. Neo-Praguian linguists, furthermore, attach great importance to 'function' and this is evident from the titles that Martinet, among other neo-Praguians, gives to his works, e.g. Phonology as

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(1) See footnote 1 on Page 7 of this thesis.

(2) See B. Trnka and Others, "Prague Structural Linguistics", in PSRL, 1964, pp. 468-480. This short article is the English version of the Russian paper which was published in Voprosy jazykoznan'ija, 3, 1957, pp. 44-52. It presents views of the following Prague linguists:- B. Trnka, J. Vachek, P. Trost, S. Lyer, V. Polák, O. Ducháček, J. Krámský, J. Noseck, M. Renský, V. Hořejš, Z. Wittoch and L. Dušková.

Functional Phonetics (London, 1949), A Functional View of Language (Oxford, 1962), Studies in Functional Syntax (München, 1975).

In his Elements (p.53), Martinet says that "the aim of phonological analysis is to identify the phonic elements of a language and to classify them according to their function in that language" (emphasis added). Having shown the importance of the notion of 'function' in Praguian and neo-Praguian linguistics, I shall proceed to present views, on this matter, of linguists like Saussure, Bühler, Trubetzkoy, Martinet, etc.

## 2.2. "Function" as Implied by F. de Saussure

What is of prime importance in linguistics is, in my opinion, what notions the linguist operates with and not what terminology he uses. This is why I think that it would be unfair not to make reference to F. de Saussure in connexion with what is, in Prague linguistics, called 'function'. Though Saussure does not use the term 'function', one can deduce his functional view of the linguistic sign throughout his Course. This is particularly the case with Saussure's treatment of what he calls the 'value'<sup>(1)</sup> of the linguistic sign. If we go deep into Saussure's conception of 'value', we can rightly, in my view, conclude that it corresponds to what we now know as 'function'. In his Course (p.110), Saussure cites the comparison of chess as an illustration of his conception of 'value'. We read:

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(1) For Saussure's notion of 'value', see Course, pp. 110f, 114f and 117f.

"Take a knight for instance. By itself is it an element in the game? Certainly not, for by its material make-up - outside its square and the other conditions of the game - it means nothing to the player; it becomes a real, concrete element only when endowed with value and wedded to it.

Suppose that the piece happens to be destroyed or lost during a game. Can it be replaced by an equivalent piece? Certainly. Not only another knight but even a figure shorn of any resemblance to a knight can be declared identical provided the same value is attributed to it."(emphasis added).

After the example of chess, Saussure goes on to talk about semiological systems which obviously include 'language'. In this connexion, he says that "in semiological systems like language, where elements hold each other in equilibrium in accordance with fixed rules, the notion of identity blends with that of value and vice versa" (ibid). Together with the notion of 'value', Saussure treats of the notions of 'unit', 'concrete entity', and 'reality' which operate within the domain of the notion of 'value'.<sup>(1)</sup> Throughout his Course, we notice that Saussure attaches great importance to the notion of 'value': "... in my opinion value is of prime importance" (p.111). Moreover, one can sense Saussure's functional treatment of the

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(1) For the terms 'linguistic units', 'concrete entities', and 'reality', see Course, pp.103f, pp.102f and pp.109 and 181 respectively.

phoneme which he conceives of as having a differentiating aspect. This holds particularly true when Saussure (Course, pp.117f) talks about the opposition and differences between different linguistic signs in a given language. Accordingly, one can infer that the notion of 'opposition' is, in Saussure's view, prior to the notion of 'phoneme'. In other words, phonemes can only be determined by means of opposition. In Course (p.119) Saussure writes:

"Phonemes are characterized not, as one might think, by their own positive quality but simply by the fact that they are distinct. Phonemes are above all else opposing, relative and negative entities."(emphasis added)

### 2.3. K. Bühler's "Organon Model"

It is worth mentioning that the basic functions of language were first dealt with by psychologists and not linguists.<sup>(1)</sup> In this respect, the man to refer to with all respect and gratitude is the Austrian psychologist K. Bühler. In a lecture delivered at the Tenth Congress of Psychologists (Bonn, April 1927), Bühler formulated his views on the functions of the phonic element.<sup>(2)</sup>

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(1) This is stated by A.V. Isačenko in his article "On the Conative Function of Language", in PSRL, 1964, pp.88-97 (esp.p.88). Isačenko originally published this article under the title "O prizyvnoj funkcii jazyka", in Recueil Linguistique de Bratislava, 1, 1948, pp. 45-57.

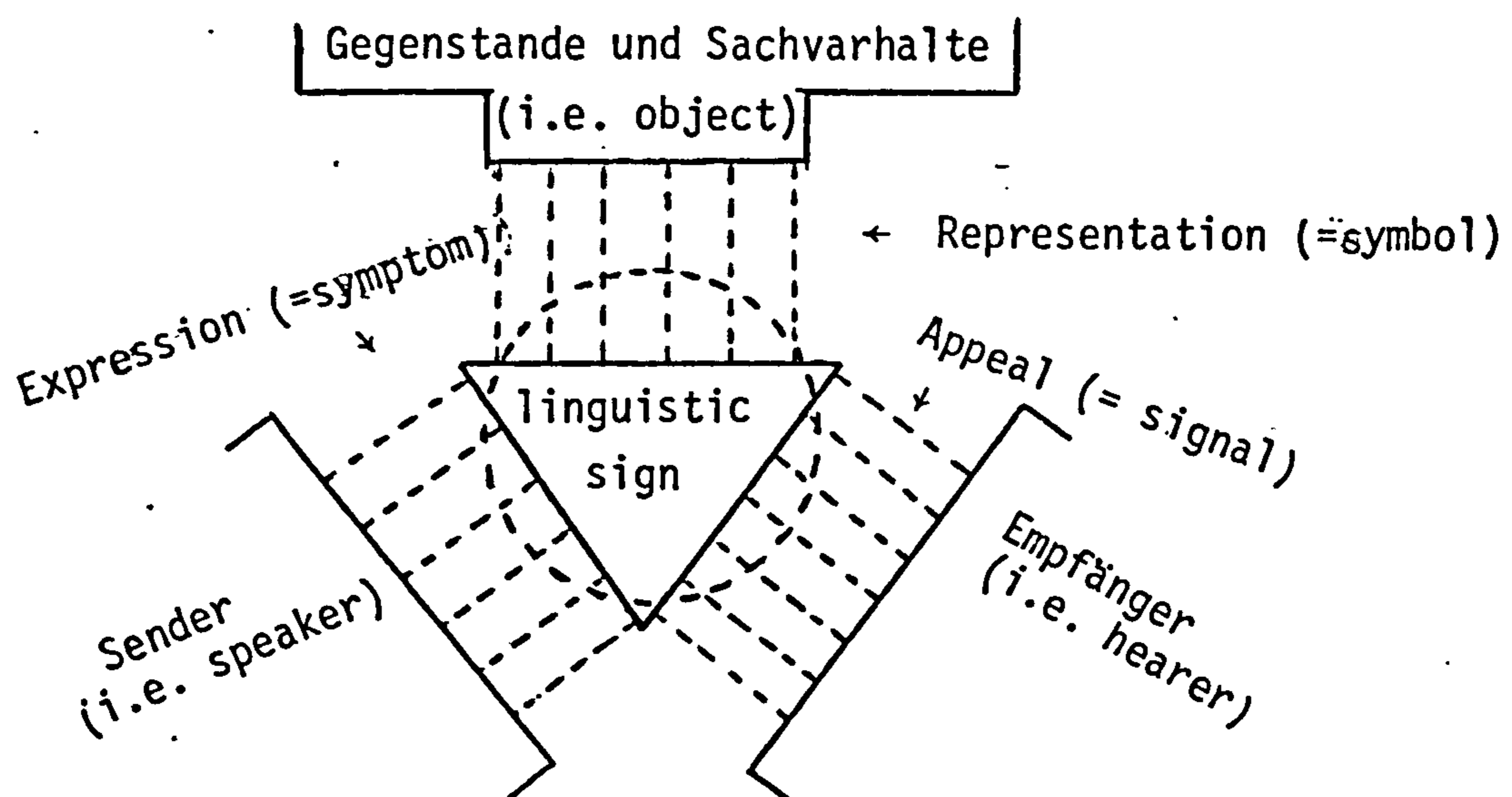
(2) See K. Buhler's (a)"Axiomatik der Sprachwissenschaft", in

Bühler conceives of language as an 'organ' which enables somebody to tell somebody else something about objects. That is to say, in any communication situation a speaker, a listener (or an addressee), and the content of the utterance are the indispensable constituents. These elements constitute Bühler's 'organon model' which has proved to be of great help in modern linguistic analysis. According to this 'organon model', any 'linguistic sign' has three characteristic relations: the first is between the sign and the speaker (Sender); the second between it and the hearer (Empfänger); and the third between it and the object (Gegenstände und Sachverhalte). As far as the speaker is concerned, the sign is a 'symptom' (Anzeichen, Indicium), whereas it is a 'signal' (Signal) from the hearer's point of view, and it is a 'symbol' (Symbol) as regards the object. Each of these three relations functions linguistically differently from the others. In other words, the functions of language are to be dealt with on three different planes. Firstly, if the linguistic sign is conceived as a 'symptom', it is said to fulfil an 'expressive' function ('Ausdrucksfunktion' or 'Kundgabefunktion' in Bühler's terminology), as in the case of English interjections

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contd. from previous page: Kant-Studien, 38, pp.40ff (esp. pp.74 & 90), and (b) Sprachtheorie, Jena, 1934 (esp. p.28). Bühler's theory of the functions of language is based on the work Logische Untersuchungen, (3rd ed.), 1922, by the philosopher Edmund Husserl. Bühler's thorough investigation has been referred to by many scholars. See for example (a) Trubetzkoy, Principles, pp.14ff, (b) Malmberg, New Trends..., pp. 205ff (esp. p.207) and (c) Malmberg, Structural Linguistics and Human Communication (2nd ed.), New York, 1967, pp. 159-164 (esp. p.160).

like oh and ah which are symptoms of a certain psychical or physical state. Secondly, if the linguistic sign is conceived as a 'signal', it is said to fulfil an 'appellative' (or 'conative') function (Appellfunktion), as in the case of English interjections like hey and hello which function in speech as 'signals'. Finally, if the linguistic sign is conceived as a 'symbol', it is said to fulfil a 'representative' (or 'referential') function (Darstellungsfunktion), as in the case of a noun like house which is a symbol of the corresponding object. Isačenko<sup>(1)</sup> makes the point that the linguistic sign may fulfil two or even three functions at the same time, but, he adds, only one of these functions is dominant in a given example. Bühler's theory of the different functions of the linguistic sign (i.e. his 'organon model') can be summarized by the following figure:<sup>(2)</sup>



(1) See A.V. Isačenko, op.cit.

(2) In this figure, I have retained the German labels found in Bühler's original model in addition to the English translations I have used in the text. For Bühler's original model, see his Sprachtheorie..., p.28 and his "Axiomatik..." pp. 74 and 90.

#### 2.4. J.M. Koříněk's Views

Koříněk's views on the functions of language are different from Bühler's. He formulated his views in an article published in 1941<sup>(1)</sup>. According to him, 'linguistic functions' should be identified with what he calls 'linguistic styles'. Therefore, he divides linguistic utterances into three types on the basis of whether they reflect 'Truth', 'Beauty' or 'Good'. As a result, Koříněk distinguishes the following three linguistic styles: (a) the 'logical' style which focusses on 'Truth' and is identified with the 'representative' function, (b) the 'aesthetical' style which focusses on 'Beauty' and is identified with the 'expressive' function and finally (c) the 'ethical' style which focusses on 'Good' and is identified with the 'conative' (i.e. appellative) function.

#### 2.5 J.von Laziczius's Views

J.von Laziczius<sup>(2)</sup> was the first to feel it necessary that the 'expressive' and 'conative' aspects of linguistic utterances should be analyzed systematically. Nevertheless, he himself basically dealt with symptomatic (i.e. expressive) aspects only. In other words, he dealt with expressive and conative aspects as though they were one and the same thing.

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(1) See J.M. Koříněk, "O jazykovém stylu" (On Style in Language), in Slovo a Slovesnost, 7, 1941, pp. 28-36.

(2) See J.von Laziczius, "Probleme der Phonologie", in Ungarische Jahrbücher, 15.



According to Laziczius, three separate types of phonic elements are to be distinguished in the system of language: (a) phonemes, which fulfil all three functions<sup>(1)</sup>, (b) emphatics, which are said to fulfil the first two functions (i.e. the expressive function and the conative function) but lack the last function (i.e. the representative function), and (c) variants, which, he thinks, can only fulfil an expressive function. The way in which Laziczius distinguishes between 'emphatics' and 'variants' is rejected by Trubetzkoy<sup>(2)</sup>. However, Trubetzkoy admits that it was Laziczius who first called attention to the need for a phonological study of Bühler's three functions.

#### 2.6. N.S. Trubetzkoy's Views

In his Principles, Trubetzkoy makes the distinction between Bühler's three functions relatively clearer. Nevertheless, he admits that "it is not always easy to distinguish the means of appeal from the means of expression" (p.22). What Trubetzkoy conceives as being focussed in conation (i.e. appeal) are not the speaker's personal feelings but the provocation of certain sentiment or emotion on the part of the listener.

Trubetzkoy gives a detailed account of each of the three functions and the relations between them. In his Principles

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(1) Namely, the expressive, the appellative and the representative functions. See Laziczius, "A New Category in Phonology", in P.2nd ICPS, Cambridge University Press, 1936, pp.57-60 (reprinted in T.A. Sebeok (ed.), Selected Writings of Gyula Laziczius, The Hague, 1966, pp. 59-63).

(2) For Trubetzkoy's views on this matter, see his Principles..., p.23; see also section 2.6 of this thesis.

(pp.23ff), Trubetzkoy considers the problem of whether or not all three of the planes discussed by Bühler above, belong to the sphere of phonology. He has no doubt of the relevance of the representative plane to phonology, but suggests that the relevance of the expressive and appellative planes is less certain. According to Trubetzkoy (and obviously Bühler), the expressive function of human speech characterizes the speaker, i.e. it tells the hearer something about the speaker (e.g. which particular human type he/she belongs to, his physical and mental characteristics, etc.). All these features about the speaker are detectable from his voice, vocabulary, and the entire style of his speech (i.e. choice of words and sentence structures). As one might realize, some of the foregoing characteristics do not belong within the phonological means of expression and so they are eliminated when considering the means of expression that belong to the "phonic aspect of the formal system of signs which constitutes the system of language" (p.16). Therefore, what belong to the "phonology of expression are only the "conventionally determined" means serving to characterize the speaker linguistically. To enlarge on and clarify the term 'conventionally', Trubetzkoy adds that "only those phonic means that characterize speakers as belonging to particular types or groups of persons, important for the existence of the particular speech community, are specified by convention" (ibid). The phonologically relevant characteristics deducible from the speaker's speech are dealt with in sufficient detail by Trubetzkoy. These relevant characteristics are, as Trubetzkoy states; age group, social class, sex, degree

of education, occupational group, city dwellers or peasants, region of origin, etc. All those features are important for the internal grouping of the speech community and for the content and form of verbal interaction. Trubetzkoy appreciatively refers to the excellent study of the function of folk costumes by P. Bogatyrev<sup>(1)</sup>. I highly approve of the reference Trubetzkoy makes as Bogatyrev's study casts light on the actual relevance of the expressive function to phonology. It makes it quite clear which features of a costume are relevant to folklore and which are not; only the conventionally determined form of the costume is relevant (or important). The properties "skinny, fat, tall, small" are only important to the tailor but not to folklore. Trubetzkoy puts forth the warning that "one must be careful, however, not to confuse formal differences with differences that are innate or developmental" (p.18). Accordingly, the case of phonological speech defects is not a matter to be dealt with in the phonology of expression. One has to realize that conventional phonic means of expression do not necessarily reveal the real character of the speaker but how he would like to appear in a particular situation. The phonological means of expression that characterize a specific group of speakers, within a speech community, constitute a system which may be regarded as the style of expression of the given group (e.g. occupational style which differs from one occupational group to another).

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(1) See P. Bogatyrev, "Funkcie Kroja na Moravskom slovensku", in Spisy Ná roolopisného Odboru Matice Slovenskej, 1, 1937.

"Permissible sound substitution" is a special type of phonological means of expression (p.19). In every speech community there are some sounds used by a few speakers as alternatives of certain sounds used by all average speakers because they dislike them. This 'dislike' might be due to some common speech defect<sup>(1)</sup> or sometimes a kind of 'fad'. The more often these substitutions are adopted or used, the more they become the personal means of expression of those speakers. Sometimes certain phonological means can fulfil an expressive function as well as a representative function at the same time. This becomes clear when we have a group of speakers whose speech may be differentiated from the usual speech pattern in neglecting a distinctive phonological opposition, or vice-versa (i.e. in showing a distinctive phonological opposition that does not exist in the speech of other groups of speakers).

In the phonology of 'appeal', on the other hand, we have means of expression whereby the speaker evokes certain sentiments or feelings in the hearer. What is essential on this plane is that the hearer be impressed irrespective of whether the speaker experiences those sentiments or whether he only creates them. Here the speaker does not mean to reveal his own feelings but he intends to provoke those feelings on the part of the hearer.

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(1) In Arabic (esp. in SIA), for example, |r| is usually realized as an alveolar flap, but is sometimes substituted by a velar fricative by some speakers due to a speech defect, which they may have been born with. The various r- substitutions are referred to by Trubetzkoy in connexion with European languages, see Principles, p.19.

One has to make a clear distinction between phonological means of appeal and any natural emotional expressions. As an example of the function of appeal, Trubetzkoy cites the German word "schschöön!" when said in rapture. In this example, the exaggerated lengthening of the consonant and vowel is considered to be linguistic, i.e. "glottic" (see Principles..., p.21). I find it appropriate to explain what Trubetzkoy means by "glottic". Any feature is said to be 'glottic' if it accounts for the following: (a) being observed only in linguistic, not extralinguistic, expressions, (b) having a certain function, and (c) being conventional in nature like all other linguistic means that fulfil definite functions. Such phenomena are, therefore, part of the phonology of appeal. The cited example, then, can signal rapture as well as irony. The task of the phonology of appeal is "only to determine those conventional phonic marks by means of which emotionally tinged speech is distinguished from emotionally neutral, tranquil speech" (p.22). As mentioned earlier, Trubetzkoy admits the difficulty of distinguishing the appellative means from the expressive means, and hopes that future research might make the distinction clear within the various styles of speech. He thinks that all three functions of language are interrelated and mixed in the concrete speech event and that it is the hearer that analyses this complex into its components, each of which has only one function, each of these functional elements being associated and identified with a certain element of the system of language (p.23).

Concerning the overlapping between the means of expression and the means of appeal, Trubetzkoy suggests that two separate branches of phonology should be established, viz. the phonology of expression and the phonology of appeal.

The phonology of representation, on the other hand, would cover a wide area leaving a small amount of factual material to the other two branches of phonology proposed by Trubetzkoy. In addition, the phonology of expression and the phonology of appeal would have certain features in common which the phonology of representation would lack. As an illustration of this, Trubetzkoy states that the problem of separating natural features from conventional features, which exists in the phonology of appeal and expression, has no relevance or significance to the phonology of representation (p.24). Owing to the sharp dividing line between means of expression and means of appeal, on the one hand, and means of representation, on the other, the investigation of the expressive and appellative phonic means is assigned to a special branch of phonology called "phono-stylistics" which could, according to Trubetzkoy, be sub-divided into "stylistics of expression" and "stylistics of appeal", on the one hand, and "stylistics of phonetics" and "stylistics of phonology" on the other. Though the phonological description of a given language (or dialect) must account for the stylistics of phonology of both the expressive and the appellative functions, yet its proper object must still be the phonological study of the plane of representation. In so doing "phonology need not be divided

into a phonology of expression, a phonology of appeal, and a phonology of representation" (pp.24f). The term "phonology" can therefore be exclusively concerned with the study of sounds belonging to the plane of representation of the system of language, whereas "stylistics of phonology", which is part of "phono-stylistics", deals with the study of the expressive and appellative means of the system of language.

On the plane of representation, Trubetzkoy (Principles..., pp.27f) talks about another set of functions that phonic elements can fulfil. He thinks that all phonic elements serve to designate the lexical meaning of a given sentence but not all of them fulfil the same function. Therefore, he distinguishes three different functions that different phonic elements may fulfil. Firstly, the "culminative" function serves to inform the listener how many units there are in a given utterance. For example, this function is fulfilled by "primary stress" in German and English as the number of primary stresses in a German sentence (similarly in an English sentence) corresponds to the number of units it has. Secondly, the "delimitative" function signals the boundary between units, i.e. it shows where one unit ends and the next starts. This function is, for example, fulfilled by the initial glottal stop before vowels in a moneme in German; it is also fulfilled by an accent in Czech which is bound (i.e. fixed) - an accent in Czech always falls on the initial syllable. Finally, the "distinctive" function

(or meaning-differentiating function, as Trubetzkoy also calls it) serves to distinguish between different semantic units. In German, for example, the minimal pairs "List"/"Mist" (English: list/dung or dirt) and "Mast"/"Macht" (English: mast/might) fulfil a distinctive function as the substitution of [l] by [m] or [s] by [x] results in changing the meaning of the respective words. Since language is, as stated before, a means of communication, Trubetzkoy rightly thinks that it is for linguistic communication that a distinctive function is indispensable. In other words, it is in a broader context of the necessity of linguistic communication that a distinctive function is absolutely necessary; the culminative and delimitative functions being expedients.<sup>(1)</sup> Trubetzkoy describes the culminative and delimitative functions as being "convenient ancillary devices" (Principles..., p.28).

### 2.7 A. Martinet's Views

As mentioned earlier, Martinet (Elements..., p.53) believes that "the aim of phonological analysis is to identify the phonic elements of a language and to classify them according to their function in that language" (emphasis added), which clearly shows that the notion of 'function' is the basis of Martinet's linguistic theory. In Martinet's view, the main function of

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(1) I fully agree with Trubetzkoy (and Martinet, as we shall see in section 2.7 of this thesis) on this matter, which is why I shall concentrate on the "distinctive" function in the course of my analysis of the phonology of the SIA word (i.e. in Part Two of this thesis).



language is communication.<sup>(1)</sup> He thinks, and I quote, that "language... is conceived essentially as an instrument of communication"(Elements..., p.17). It is a well-known fact that language changes with time in order to satisfy the needs of communication of a given speech community. Communication takes place wherever man is faced with a situation where he has in his mind some thoughts to communicate to the listener by means of language. However, I believe that language is not the only means of communication.<sup>(2)</sup> To Martinet, language has an "aesthetic" function which is so closely related to its communicative and expressive functions (see Elements..., p.19). In connexion with linguistic communication, Martinet talks about "linguistic evolution" which is based on man's tendency for "least effort", i.e. reducing his mental and physical effort to the minimum compatible with maintaining satisfactory linguistic communication.<sup>(3)</sup>

Martinet's views on the functions of phonic elements are different from Trubetzkoy's due to the fact that Martinet's views are based on his theory of "double articulation" which is

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(1) On the notion of 'communication', see Martinet's Elements..., pp. 17f, 167f and 169f.

(2) There are other 'semiotic' systems by means of which communication can be achieved. 'Non-verbal' communication can be achieved by means of semiotic systems such as the system of 'traffic signals'. Semiotic systems other than the language system elude the framework of what Martinet calls "double articulation". For information on "semiology" (or "semiotics"), see Saussure's Course..., pp. 16f and 68.

(3) On "language economy" in terms of "least effort" accounting

the cornerstone of his linguistic theory in general. Therefore, Martinet distinguishes three "fundamental" functions (see Elements..., pp. 53f). The essential phonological function of phonic elements is, in Martinet's view, their "distinctive" (or "oppositional") function.<sup>(1)</sup> The phonic elements of a given language (or dialect) are said to fulfil a "distinctive" function "when they contribute to the identification, at one point of the spoken chain, of one sign as opposed to all the other signs which could have figured at that point if the message had been a different one" (ibid. p.53), as in the case of the French sign /bier/ in the utterance "c'est une bonne bière". The sign /bier/ "is identified as such by its four successive phonemes, each of which plays its part by the fact that it is distinct from all other phonemes which could have figured in this context" (ibid.). On the other hand, the phonic elements of a given language (or dialect) may fulfil a "contrastive" function<sup>(2)</sup> "when they help the hearer in analysing the utterance into successive units" (ibid.), as in the

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contd. from previous page: for "linguistic evolution" see Martinet's Elements..., pp. 167ff.

(1) Martinet's conception of the "distinctive" function is the same as Trubetzkoy's and both scholars rightly think that it is the "distinctive" function that is indispensable for linguistic communication.

(2) Martinet's notion of "contrastive" function may cover that of "demarcation" (see Elements..., p.53) as well as "culmination" (see Elements..., p.87). In his Phonology as Functional Phonetics... cit, Martinet considers the function of an accent in Czech as being "not only culminative but demarcative, as it shows without ambiguity where each word begins" (p.12). Furthermore, Martinet's "demarcative" function corresponds, in

case of "the accent in general and particularly in a language like Czech, where the accent occurs regularly on the first syllable of every word" (ibid). Martinet also mentions the example of the English Phoneme /h/ "which, in addition to its essential distinctive function (hill, as distinct from ill, bill, pill, etc.), has also one of demarcation, since /h/ cannot, in traditional vocabulary, appear anywhere except at the beginning of a moneme" (ibid). Finally, the "expressive" function "serves to inform the hearer about the state of mind of the speaker without recourse to the scheme of the double articulation" (pp.53f), as in the case of the lengthening and exaggeration of French /p/ in "impossible" in "cet enfant est impossible" which "may be interpreted as an indication of irritation, whether real or feigned" (p.54).<sup>(1)</sup>.

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contd. from previous page: my opinion, to Trubetzkoy's "delimitative" function, see section 2.6 of this thesis.

(1) This example is not to be confused with Trubetzkoy's example of German "schschöön!" (see section 2.6 of this thesis) which Trubetzkoy considers as fulfilling an appellative function. The two scholars' different interpretations of seemingly similar examples is, in my view, due to the reference Martinet makes (and Trubetzkoy never does) to "double articulation" in his definition of the "expressive function" (cited in this section of the thesis). Martinet's views on the functions of phonic elements apparently neglects what Bühler and subsequently Trubetzkoy call the "appellative" function.

## Chapter Three

BASIC FUNCTIONAL NOTIONS - (A)3.1. The Phoneme

In the literature on functional linguistics, the reader comes across different approaches to the concept of the 'phoneme'. This indicates that the definition of the phoneme had undergone a great deal of alteration and evolution before it reached its present state. Therefore, I shall give a brief sketch of the various definitions proposed by a number of functionalists in order to explicate the matter.

Initially, the phoneme was approached from a psychological angle. This is obviously due to the Saussurean and Russian influence<sup>(1)</sup> on Prague linguistics, as I have remarked before. In his Course, Saussure conceives of what he calls the 'phoneme'<sup>(2)</sup> as the "sum of the auditory impressions and articulatory movements, the unit heard and the unit spoken, each conditioning the other" (p.40). Moving from Saussure to the Polish philologist (also a pioneer of phonology) Baudouin de Courtenay, we find that Baudouin<sup>(3)</sup> defines the phoneme as

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(1) By 'Russian influence' I mean the influence exerted on Prague linguistics by the Kazan School of Linguistics represented by J. Baudouin de Courtenay and L.V. Ščerba.

(2) Though Saussure used the term 'phoneme', he was, in fact, talking about what is known today as the 'speech sound'. See Tullio de Mauro's view on this point in his critical edition of Saussure's Cours (Paris, 1973).

(3) See J. Baudouin de Courtenay, Próba teorji alternacyj fonetycznych, Cracow, 1894 (German version, Versuch einer Theorie phonetischer Alternationen, Strassburg, 1895).

"a psychical image of a sound" (eine Lautvorstellung) which arose by way of merging into one the psychical<sup>(1)</sup> images of individual sounds representing that phoneme. In other words, Baudouin conceives of the phoneme as a 'mental' concept as opposed to sound which is purely physical. On the other hand, L.V. Ščerba, in his well-known monograph on Russian vowels, defines the phoneme as "the shortest general sound image of a given language which can be associated with images of meaning and can differentiate words".<sup>(2)</sup> In this definition which is still under the spell of association psychology<sup>(3)</sup> as in Ščerba's Court exposé de la prononciation russe (1911, p.2), the distinctive function of the phoneme was clearly stressed for the first time.<sup>(4)</sup>

The above definitions of the phoneme clearly make reference to psychology. They were adopted by Prague linguists like Trubetzkoy and Jakobson.<sup>(5)</sup> The psychologistic spell is felt

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(1) By 'psychical' is meant 'acoustic and motoric'.

(2) L.V. Ščerba, Russkije glasnyje, St. Petersburg, 1912, p.14.

(3) In his New Trends... cit, MalMBERG defines "association psychology" as "the trend in psychology which regards intellectual and emotional phenomena as being governed by a network of associations between various elements" (footnote 2 on p.204).

(4) See LSP, p.44. The 'distinctiveness' of the phoneme is implied by Ščerba's word 'differentiate'.

(5) I wish to repeat, however, the fact that Mathesius used a purely functional definition of the phoneme right from the start. See his (a) "Ziele und Aufgaben der Vergleichenden Phonologie", in Xenia Pragensia, 1929, pp.432-445, where phonemes are defined as sounds that possess a functional validity in the analyzed system, (b) "La structure phonologique du lexique du tchèque moderne", TCLP, 1, 1929, pp.67-84 (reprinted in PSRL, pp.156-176), and (c) "On the Phonological System of Modern English", in Donum natalicium Schrijnen, Nijmegen - Utrecht, 1929, pp. 46-53, where he says that "basic

in Trubetzköy's definition of 1929 in his famous paper on the phonological systems of vowels,<sup>(1)</sup> where he uses the term "Lautvorstellung" (i.e. phonic idea or image). The Baudouinian influence is manifested in the definition of the phoneme included in the 1929 theses (TCLP, 1, pp. 7-29) which were presented to the First Conference of Slavic Philologists. In these theses, phonemes are defined as "des images acoustico-motrices le plus simples et significatives dans une langue donnée" (pp.10f).

The psychologistic bias was frequently criticized in the LCP's meetings (especially by the Ukrainian scholar D. Čyževskýj and the Austrian psychologist K. Bühler<sup>(2)</sup> at the First International Conference of Phonology, 1930). In 1928, furthermore; the notion of 'image' was eliminated by N.F. Jakovlev who

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(contd. from previous page)..phonological elements shortly called phonemes, are sounds endowed with functional values..."(p.47). A similar definition to this is referred to in Krámský's The Phoneme...cit (p.33), but is said to be included in Mathesius's "Funkční linguistika" [Functional Linguistics] in Sborník I sjezdu profesorů filosofie, Praha, 1929. For the definition included in (b) above, see footnote 1 on p.7 of this thesis. Furthermore, in his Czech paper "Fonetika její podstata a vývoj" [Phonetics, its Essence and Development] in Věda a Život, 7,1940, pp. 23-30, Mathesius defines the phoneme as "a functionally relevant sound which is the basic unit of the phonological analysis of speech in contradistinction to 'sound in general' which is the basic unit of phonetic analysis of speech" (Krámský, op.cit, pp.33f).

(1) See N.S. Trubetzkoy, "Zur allgemeinen Theorie der phonologischen Vokalsysteme," TCLP, 1, 1929, pp. 39-67 (reprinted in PSRL, pp. 108-142).

(2) See (a) D. Čyževskýj, "Phonologie und Psychologie", TCLP, 4, 1931, pp. 3-22, and (b) K. Bühler, "Phonetik und Phonologie",

defines the phoneme as "any sound feature that can be extracted from the spoken chain as its shortest element used to differentiate meaning units".<sup>(1)</sup> Trubetzkoy, too, strongly rejects any use of psychologistic expressions like 'image', 'linguistic consciousness', 'psyche', 'sensory perception', etc. We read:

"All these psychological expressions are not appropriate to the nature of the phoneme, and must therefore be refused... Recourse to psychology in the definition of the phoneme must be avoided, for the phoneme is a linguistic and not a psychological concept. Any reference to 'linguistic consciousness' must be eliminated from the definition of phoneme... The phoneme is, above all, a functional concept that must be defined with respect to its function. Such definition cannot be carried out with psychologistic notions... The phoneme can be defined satisfactorily neither on the basis of its psychological nature nor on the basis of its relation to the phonetic variants, but purely and solely on the basis of its function in the system of language."

(Principles..., pp. 37-41)

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(contd. from previous page).. TCLP,4,1931,pp. 22-53. Furthermore, Bühler, in his paper "Psychologie der Phoneme" (in P.2nd ICPS, 1936, pp.162-169), defines the phoneme on the basis of its function in the system of language. To him, that is, the phoneme functions as "Lautmal am Wort-körper" (i.e. vocal mark on the body of the word).

(1) See N.F. Jakovlev, "Matematičeskaja formula postrojenija

Trubetzkoy's rejection of the terms 'linguistic consciousness' and 'psyche' arose from W. van Wijk's use of them in his definition of the phoneme<sup>(1)</sup> which reads:

"The phonemes of a language form a category of linguistic elements which are present in the psyche of all members of the speech community."

He adds that phonemes "are the smallest units sensed as not further divisible by linguistic consciousness" (Sprachbewusstsein = linguistic consciousness).<sup>(2)</sup>

A.W. de Groot<sup>(3)</sup> gives a fairly functional definition of the phoneme.<sup>(4)</sup> We read:

contd. from previous page:... alfavita" in Kul'tura i pis' mennost' Vostoka, 1, 1928, p.46.

(1) The definition to be quoted is Baltaxe's translation of van Wijk's definition of the phoneme contained in his De Nieuwe Taalgids (1936, p.23) and quoted by Trubetzkoy in his Principles (pp.38f).

(2) Transformationalists still operate with what they term as 'linguistic intuition' whose conception is, in a sense, similar to that of 'linguistic consciousness' used by W. van Wijk. On the notion of 'linguistic consciousness' see also (a) A. Mirambel, 'Essai sur la notion de 'conscience linguistique', in J. Psych., 55, 1958, pp. 266-301, and (b) H. Weinrich, "Phonemkollisionen und phonologisches Bewusstsein," in Suppl. to Phonetica, 4, 1959, pp. 45-48.

(3) See W. de Groot, "Phonologie und Phonetik als Funktions - wissenschaften," TCLP, 4, 1931, pp. 116-147 (esp. p.125).

(4) But see Principles (pp.43f) where Trubetzkoy criticizes de Groot's use of the term 'recognition' which is a psychological process. Trubetzkoy also suggests that the differential, i.e. distinctive, function of the phoneme is more important than that of recognition or identification (which is the essential function of the phoneme in de Groot's view). The latter function, for which de Groot uses the term "Wiedererkennung", is described by



"The phoneme is... a phonological symbolic sign which has a self-evident function. The essential function of the phoneme is the following: to make possible or facilitate, if need be, the recognition and identification of words or parts of words that have symbolic value by means of the fact that the phoneme itself is recognizable and identifiable. Phonemes may be defined as the shortest fractions of sound sequences that have this function."

In 1934, L. Novák formulated a new definition of the phoneme which reads as follows:

"Par 'phonèmes' on entend les éléments les plus petits de la langue non susceptibles d'être partagés davantage et qui se voient dégagés grâce au croisement simultané de toutes les fonctions internes de la langue projetées sur la forme de la même langue".<sup>(1)</sup>

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contd. from previous page:...Vachek (in his "Several Thoughts on Several Statements of the Phoneme Theory," American Speech, 10/4, 1935, pp. 243-255) as 'positive function'. On the meaning of 'positive function' as compared with 'negative function', Krámský (The Phoneme... cit, p.50) writes:

"The positive function of a phoneme is best realized if the meaning of the form containing it becomes changed owing to its omission (call: all), whereas the negative function of a phoneme comes best to light if the meaning of the form containing it becomes changed owing to its substitution by another phoneme (call:tall, etc.)."

(1) This definition originated in 1934 in an unpublished

A similar formulation to Novák's (1934) and Ščerba's (1912) quoted above is found in Trubetzkoy's Principles (p.35).

Trubetzkoy's formulation reads as follows:

"Phonological units that, from the standpoint of a given language, cannot be analyzed into still smaller successive distinctive units are phonemes. Accordingly the phoneme is the smallest distinctive unit of a given language", (emphasis added)

As Trubetzkoy himself states (see Principles, p.44, footnote 4), the definition just quoted was first contained in R. Jakobson's Remarques... cit (1929, p.5). Jakobson writes: "Tous termes d'opposition phonologique non susceptibles d'être dissociés en sous-oppositions phonologiques plus menues sont appelés phonèmes" (emphasis added). This is the definition which reappears in a slightly different wording in the "Projet" (TCLP, 4, 1931, p. 311) where the phoneme is conceived as "Unité phonologique non susceptible d'être dissociée en unités phonologiques plus petites et plus simples" (emphasis added). Neither the 1931 definition (contained in the "Projet") nor Trubetzkoy's definition (quoted above) gained enough ground because they both stressed the 'indivisibility' of the phoneme into smaller units of the same kind. More specifically, the "Projet"

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contd. from previous page:...manuscript and was included in Novák's paper "K základním otázkám štruktúrného jazyko sputu" [On Fundamental Questions of Structural Linguistics], in Sborník Matice slovenskej, 15, 1937, p.13. Finally it appeared in his French article "Projet d'une nouvelle définition du phonème," TCLP, 8, 1939, pp. 66-70 (esp. p.68).

definition was highly disapproved of by Vachek in his 1936 article,<sup>(1)</sup> where he makes it clear that the phoneme is analyzable into smaller significative elements called 'distinctive features'.<sup>(2)</sup> In this article, Vachek makes a sharp distinction between the notions: phonological unit, phonological opposition, and phoneme. Consequently, he proposes the following definitions to replace those contained in the "Projet" (see PSRL, p.148):<sup>(3)</sup>

"Phoneme: a part of the members of the complex phonological opposition, a part which may be dissociated into simultaneous, but not into successive phonological units...

Simple Phonological Opposition: a minimum phonic opposition capable of serving, in the given language, for the differentiation of intellectual meanings...

Complex Phonological Opposition: a non minimum phonic opposition of analogous capacity...

(1) See J. Vachek, "Phonemes and Phonological Units", TCLP 6, 1936, pp. 235-239 (reprinted in PSRL, 1964, pp. 143-149).

(2) The term 'distinctive feature' is also used by transformationalists but their conception of it is different from that of the Praguians and neo-Praguians. Therefore, I suggest that the alternative term 'relevant feature', which is also used by functionalists, should be used instead to avoid any misunderstanding.

(3) Vachek also gives the French wording of the definitions he proposes so as to replace the original French wording contained in the "Projet". For Vachek's French wording, see PSRL p.148.

Phonological Unit: a member of a simple phonological opposition..."

In the above paper, Vachek also makes reference to the definition he gave in his 1935 paper (i.e. his "Several Thoughts...") by stating that the definitions of the phoneme which are contained in both papers do not contradict each other. In the 1935 paper the phoneme was defined as a "a signal-like counter of the language which becomes manifested in actual speech by means of (two or more) sounds which are (1) related in character, and (2) mutually exclusive as to their phonic surroundings; all exceptions to (2) must be accounted for on morphematic grounds only" (p.250). The wording of this definition dates, as Vachek states, from 1932.<sup>(1)</sup> Comparing his 1935 definition with that of 1936, Vachek states that they both refer to one and the same thing and that each of them has its own advantages and disadvantages (see PSRL, pp. 147f).

Trubetzkoy, later in his Principles (namely on p.36), recognizes the divisibility of the phoneme into simultaneous properties which he calls "relevant properties" (i.e. relevant features). Accordingly, he defines the phoneme as "the sum of the phonologically relevant properties of a sound (Lautgebilde)".<sup>(2)</sup>

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(1) See J. Vachek, "Prof. Daniel Jones and the Phoneme," in Charisteria Gu. Mathesio oblata, Prague, 1932, pp. 25-33.

(2) For the sake of clarity, I quote the German wording as contained in Grundzüge (Göttingen 1939, p.35): "Man darf sagen, dass das Phonem die Gesamtheit der phonologischen relevanten Eigenschaften eines Lautgebildes ist". The French wording

This definition, in fact, goes back to as early as 1932 when R. Jakobson<sup>(1)</sup> defined the phoneme as "a set of those concurrent sound properties which are used in a given language to distinguish words of unlike meaning" (p.231). Although this definition first appeared in 1932, it was not widely known then due to its unusual place of publication. But in the mid-thirties and after Trubetzkoy adopted it in the formulation quoted above, it started gaining more and more ground. In 1940, Trnka<sup>(2)</sup> wanted to remove deficiencies of both of Trubetzkoy's definitions (contained in Principles and quoted above) by proposing the following formulation to replace Trubetzkoy's: "In a given language system the phoneme is the smallest total of phonologically distinctive qualities which together with other such totals forms a word" (emphasis added).

In conclusion I wish to note that all the later Praguian definitions of the phoneme have two features in common: (a)

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contd. from previous page...(contained in Cantineau's translation Principes..., Paris, 1949, p.40) is, on the other hand, comparatively less clear; it reads: "... le phonème est la somme des particularités phonologiquement pertinentes que comporte une image phonique".

(1) See R. Jakobson, "Fonéma," in Ottův slovník naučný nové doby, Part 2, vol.1, 1932, p.608. The definition to be quoted is found on p.231 of Jakobson's English translation of the above article under the title "Phoneme and Phonology" contained in his SW, 1, pp. 231f.

(2) See B. Trnka, "O současném stavu bádání ve fonologii"[On the Contemporary State of Phonological Studies], in Slovo a Slovesnost, 6, 1940, pp. 164-170 and 203-215. The English translation of Trnka's definition proposed in this article, which is to be quoted, is contained in Krámský's The Phoneme.. cit, 1974, p.40.

their regard for semantic criteria (evidenced by the stress laid on the differentiation of meaning), and (b) the attention they pay to the phonic facts implementing the phoneme (evidenced by the reference, explicit or implicit, to 'phonic oppositions' or to 'relevant qualities of sounds'. At this point, I find it necessary to introduce the neo-Praguan viewpoint on the definition of the phoneme as manifested in Martinet's Elements (p.25), among other neo-Praguan works, from which I quote the following:

" Like every sign the moneme is a unit with two facets, one the significatum, its meaning or value, and the significans itself in its phonic forms. The latter are composed of units of the second articulation, to which we give the name phoneme."(emphasis added).

### 3.2. The Relevant Feature

As stated in the previous section, Trubetzkoy's second definition of the phoneme (Principles, p.36) has been gaining more and more ground, and it is the one I shall adopt in defining the SIA phonemes. The notion of 'relevant properties' (i.e. relevant features) constitutes the very essence of this definition which reads:"... the phoneme is the sum of the phonologically relevant properties of a sound (Lautgebilde)". The notion of the 'relevant feature' has also been utilized by what I have called the 'neo-Praguians' (i.e. Martinet and his

group). The widespread use of the term 'relevant feature' by many scholars makes it inevitably necessary to explain what the term means.

The concept of what was later termed the 'relevant feature' had been proposed by R. Jakobson as far back as 1932 (see below) but "its systematic analysis was sketched in Jakobson's publications of 1938 - 1941" (Krámský, op.cit., p.111) and "its deepening was done in the post-war years" (ibid). In his 1932 article (SW, 1, p.231), Jakobson used the notion of 'relevant feature' for the first time in his conception of the phoneme as "a set of those concurrent sound properties which are used in a given language to distinguish words of unlike meaning" (emphasis added). The underlined part of this definition forms Jakobson's conception of relevant features. However, I wish to note that "what is typical of Jakobson's position... is not the analysis of phonemes into distinctive [i.e. relevant, A.R.] features, but the binary character of the latter".<sup>(1)</sup>

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(1) G.C. Lepschy, Survey...cit., p.96. The 'binary' character of Jakobson's distinctive features gave rise to the theory of 'distinctive-feature analysis' developed in the U.S. by Jakobson, Chomsky, Halle and others. Moreover, Lepschy (ibid, p.107) remarks that "Martinet... emphatically rejects Jakobson's theory that there is a universal inventory of distinctive features and that these are all binary" (emphasis added). In other words, the 'binarity' and 'universality' of Jakobson's distinctive features are the two basic points of difference that set the Praguian (and subsequently the neo-Praguian) and the American theories of 'distinctive features' apart. For this reason, I have previously recommended that the term 'relevant feature' should be used instead of 'distinctive feature' in connexion with functional (i.e. Praguian and neo-Praguian) phonology.

In the light of the revised definitions of 'phonological unit' and 'phonological opposition (simple and complex)' proposed by Vachek in his 1936 article mentioned above (see LSP, p.45 and PSRL, p.148), we can conclude that the relevant feature is conceived as a phonological unit and consequently a member of a simple phonological opposition (the phoneme being a member of a complex phonological opposition). According to Vachek, that is, the relevant feature is the smallest distinctive (or significative) element in the phonology of a given language. This definition can best be illustrated by the English opposition between make and bake which is said to be valid, not because /m/ is different from /b/ but because only one property (i.e. feature) in each is different from the corresponding one in the other (viz. "nasal" as opposed to "non-nasal", respectively); other features of /m/ and /b/ being exactly the same.

On the other hand, Trubetzkoy (Principles..., p.66) apparently conceives of 'relevant features' as "those properties which are common to all variants of a phoneme and which distinguish it from all other phonemes of the same language, especially from those that are most closely related"<sup>(1)</sup> (emphasis added). Furthermore, Trubetzkoy (Principles..., pp.92-227) gives an

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(1) To the best of my knowledge, nowhere in Trubetzkoy's works can we find a direct definition of the 'relevant feature'. Nevertheless, the definition quoted is included in Trubetzkoy's definition of 'phonemic content' (see section 3.3 of this thesis).



exhaustive account of the types of what he calls 'distinctive phonic properties' (i.e. relevant features).<sup>(1)</sup>

In 1954, B. Trnka<sup>(2)</sup> conceives of 'relevant features' as "all features of the phoneme which are a reflexion of its position or of contiguous phonemes in the word"<sup>(3)</sup> (emphasis added).

The neo-Praguian conception of the 'relevant feature' is, in my opinion, best found in Martinet's works. In his La linguistique synchronique...cit, Martinet conceives of the 'relevant feature' as "un ensemble de caractéristiques phoniques distinctives qui ne se trouvent dissociées nulle part dans le système..." (p.138). That is to say, a relevant feature is a 'complex' of distinctive phonic characteristics. Martinet illustrates this definition through his treatment of relevant features such as "bilabial" and "voiced" (i.e. "bilabiality" and "voicing", respectively, in Martinet's terminology) in connexion with English. He quite rightly states that the relevant feature "bilabial" presupposes not only an occlusion effected by means of the two lips, but a whole working of the complex of the oral and pharyngeal organs. The relevant

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(1) For a summary of the different types of relevant features, see Lepschy, op.cit., p.59; see also section 6.4 of this thesis.

(2) See B. Trnka, "Určování fonému" [On Determining the Phoneme] in Acta Universitatis Carolinae, 7, Philologica et historica, 1954, pp. 16 - 22.

(3) This is Krámský's English wording of Trnka's definition of the 'relevant feature'. See Krámský, op.cit. p.67.

feature "voiced", on the other hand, involves not only glottal vibration, but a certain degree of articulatory energy and probably other characteristics which could be decisive, at least in certain contexts. In other words, "bilabial" designates what is common in the behaviour of the English phonemes /p/, /b/ and /m/ in the different contexts in which they occur, and which distinguishes them from "non-labial" phonemes (e.g. /t/, /d/ and /n/, respectively); "voiced", on the other hand, designates what is common in the behaviour of the English phonemes /b/, /v/, /d/, etc., and which distinguishes them from the corresponding "voiceless" phonemes (i.e. /p/, /f/, /t/, etc., respectively), and does not necessarily imply, in all the realizations, glottal vibration. Moreover, Martinet (ibid, pp.138f) makes the point that "le terme qui designe un trait distinctif<sup>(1)</sup> doit toujours être compris comme conventionnel et non descriptif". That is, the term which designates a relevant feature must be conventional (i.e. traditional) and non-descriptive, e.g. "voicing", "bilabiality", "laterality"<sup>(2)</sup>. This, as Martinet believes, enables all linguists to identify

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(1) On the notion of 'relevant feature' (i.e. 'trait distinctif' or 'trait pertinent' in French), see also T. Akamatsu, "De la notion de 'trait pertinent' en phonologie," in Linguistique fonctionnelle: débats et perspectives, Paris: Presses Universitaires de France, 1979, pp. 109-120.

(2) Martinet uses terms like "voicing", "bilabiality", "laterality", etc. instead of "voiced", "bilabial", "lateral", etc., respectively. However, I have used and will continue to use the latter set of terms which are used more frequently by functionalists, but which are also meant to be non-descriptive as long as they are used within inverted commas.

immediately what is meant by each of them. He also asserts that a relevant feature should always be considered as being used within inverted commas: "là même où l'on se dispensera de cette précaution" (ibid, p.139). Martinet goes on to talk about phonemes which, in a given language, can be distinguished from the other phonemes of the same system by means of only one relevant feature, as he puts it.<sup>(1)</sup> Among other examples, he cites the French phoneme /l/ which is characterized by the one relevant feature "laterality" (i.e. "lateral" in my terminology). He suggests, therefore, that it will be quicker to say that French /l/ is "l" since "laterality" is a purely conventional term.

The 'distinctiveness' of the 'relevant feature' comes best to light when we compare, as Martinet does, English utterances like make it and read it. In this example, we notice from the reactions of the addressee that each of these utterances has a different meaning. This meaning (i.e. semantic) difference is associated with a phonic difference, viz.[meik] being different from[ri:d]. The phonic difference will be smaller if we compare make it with check it; this time the difference being [mei-] as opposed to [tʃe-]. If we proceed

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(1) When we want to distinguish between two phonemes (and ultimately two words), at least two relevant features should be involved; one possessed by each of the respective phonemes. French /l/ is distinguished from the other phonemes of the system by the relevant feature "lateral" as opposed to whatever relevant feature(s) the other phoneme involved has. In SIA for example, /l/ is distinguished from /r/ by means of the pair of relevant features "lateral" and "vibrant", respectively.

with our comparison further, the phonic difference becomes smaller still; i.e. the difference between make it and take it, for example, is reduced to [m-] as opposed to [t-]. The minimum difference we can get is when we oppose make it to bake it; the phonic difference (and in turn the semantic difference) being created by only one relevant feature of the first segment (i.e. phoneme) in each utterance, i.e. /m/ and /b/, respectively. In other words, although /m/ and /b/ share the features "voiced" and "bilabial", what keeps them (and in turn the respective utterances) apart is merely the relevant feature "nasal" possessed by /m/ as opposed to the relevant feature "non-nasal" possessed by /b/. These features are said to be "relevant" because they operate distinctively in the given language, i.e. English.

The above account serves as a brief statement of what is meant by the term 'relevant feature' which is of prime importance in phonological description in general and in this thesis in particular. In my opinion, therefore, the relevant feature is the minimal sound property capable, in a given language, of distinguishing phonemes from each other, and consequently creating a semantic difference between the corresponding utterances. The conception of the 'relevant feature' will become clearer when I have dealt with other functional notions like 'phonemic content', 'phonological opposition', etc. which are closely related to it. It will become particularly clear when I deal with the phonematic analysis of Spoken Iraqi

Arabic (SIA) in Part Two of this thesis.

### 3.3. Phonemic Content

The term 'phonemic content' is usually associated with N.S. Trubetzkoy. The concept of 'phonemic content' results from the theory of phonological (i.e. distinctive) opposition, and its determination is based on the position of a given phoneme in the system of distinctive oppositions of the language in question. According to Trubetzkoy, 'phonological opposition' is the basic concept of any phonological analysis. This is what Trubetzkoy (Principles..., pp.67f) has to say in this connexion:

"It should be remembered that in phonology the major role is played, not by the phonemes, but by the distinctive oppositions. Each phoneme has a definable phonemic content only because the system of distinctive oppositions shows a definite order or structure. In order to understand this structure, various types of distinctive oppositions must be studied".

Since it is essential in a phonological description of a given language (or dialect) that "the phonemic content of each individual phoneme must be determined..." (Principles..., p.66), let us see how the concept of 'phonemic content' has been defined. Trubetzkoy (ibid), with whom the term is usually

associated, conceives of 'phonemic content' as "all phonologically distinctive properties of a phoneme, that is, those properties which are common to all variants of a phoneme and which distinguish it from all other phonemes of the same language, especially from those that are most closely related" (emphasis added). As an illustration of this definition, Trubetzkoy gives the example of German /k/. In this connexion he points out that its feature 'velar' is irrelevant as it is not shared by all of its variants (e.g. before /i/ and /U/ it is realized as 'palatal'). Nor is the feature 'dorsal' enough for the definition of its phonemic content since /g/ and /x/, too, are 'dorsal'. As an alternative to these inadequate definitions of the phonemic content of German /k/, Trubetzkoy defines it as being "tense nonnasalized<sup>(1)</sup> dorsal occlusive" (ibid). That is to say, as Trubetzkoy puts it:<sup>(2)</sup>

" ... only the following properties are distinctive for the German phoneme k: (1) complete occlusion (as opposed to "ch"); (2) blocking of the entrance to the nasal cavity (as opposed to "ng"); (3) tight-

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(1) By "nonnasalized" we should understand "non-nasal" since the former term refers to what is known today as 'secondary (as opposed to 'primary') articulation'. 'Secondary articulation' must not be confused with Martinet's 'second articulation'.

(2) In my understanding of this quotation, the symbols Trubetzkoy uses are meant to be 'phonemic' although they are the symbols used in ordinary German orthography. The inadequacy of Trubetzkoy's phonemic and/or phonetic transcription throughout his Principles can, in my opinion, cause the reader serious misunderstanding and ambiguity as we shall see later in this thesis.

ening of the muscles of the tongue and simultaneous relaxation of the muscles of the larynx (as opposed to "g"); (4) participation of the dorsum (as opposed to "t" and "p"). k shares the first of these four characteristics with t, p, tz, pf, d, b, g, m, n, and ng; the second with g, t, d, p, and b; the third with p, t, ss, and f; and the fourth with g, ch, and ng". (pp.66f)

What is significant here is that only the sum total of the four relevant features mentioned above is possessed by German /k/ alone. Moreover, Trubetzkoy makes the point that phonemes cannot be defined in terms of phonemic content unless they have already been classified in the system of phonological oppositions that exist in a given language. In other words, the determination of the phonemic content of a phoneme is governed by its position in the phonemic system of the language under investigation.

#### 3.4. Phoneme/Variant

We have seen that the phoneme is the sum of the relevant features of a speech sound, and that the 'phoneme' and the 'relevant feature' are distinctive concepts in phonology. This implies that a speech sound also has some irrelevant features which are, by definition, non-distinctive. This is clearly stated in Trubetzkoy's Principles (p.36), where he says that

"any sound perceived and produced in the concrete act of speech contains, in addition to the phonologically relevant properties, many others that are phonologically irrelevant" (emphasis added).

Since such a sound also contains phonologically irrelevant features, it cannot be simplistically considered a phoneme, as a phoneme has only the phonologically relevant features of the corresponding speech sound(s). "But insofar as such a sound also contains the phonologically relevant properties of a specific phoneme, it can be considered the realization of this phoneme" (ibid). From the functional point of view, which is our concern, the sounds implementing a given phoneme are considered as its 'phonetic variants'.<sup>(1)</sup>

While most scholars would deal with only two categories in phonology, viz. phonemes and variants, J. von Laziczius introduces a third category, viz. *emphatica*, which he places between phonemes and variants. He deals with these three categories in his 1936 article (i.e. "A New Category...cit", pp. 60ff in T.A. Sebeok (ed.) Selected Writings... cit) where he makes the following distinction between them: he defines "phonemes" as "sign-elements which have an equal importance in the functions of representation, appeal, and expression"; "emphatica" as "sign-elements with a double function: their role is limited to the expression and the appeal"; and the

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(1) On the difference between the Praguian conception of 'phonetic variant' and the Anglo-American counterpart 'allophone', see LSP, pp.51f.



"variant" is defined as "a sign-element with one single function: expression" (e.g. the Hungarian expression [ɛimber] and [ɛmber] both mean 'man' on the representation plane, but they are different from the point of view of expression and appeal). In my opinion, Laziczius's categories of "emphatica" and "variants" are usually included under one category, viz. 'phonetic variants', by most functionalists. This is evidenced by Trubetzkoy's rejection of Laziczius's distinction between the two categories (see Principles..., p.23).

Trubetzkoy (Principles..., p.37), furthermore, conceives of a 'speech sound' (i.e. 'phonetic variant') as "the sum of all distinctive as well as non-distinctive properties occurring at a specific point in the sound flow" (emphasis added). This definition implies that "a phoneme can be realized by several different speech sounds" (ibid) called the phonetic variants of the given phoneme. As an illustration of the different realizations of phonemes, Trubetzkoy treats of the various variants of the German phoneme /g/. To start with, he gives the following as its phonologically relevant features: "complete closure between dorsum and palate, accompanied by raising of the velum, relaxation of the muscles of the tongue, and unaspirated plosive release of the closure" (ibid). What he gives as phonologically irrelevant features of German /g/ are "the place where the dorsal-palatal closure must take place and the position of lips and vocal cords during closure" (ibid). This is why it is

possible for German to have "voiced, semivoiced, and completely voiceless g sounds (even in those German-speaking regions where mediae are voiced as a rule), rounded velar g sounds..., unrounded velars..., unrounded strongly palatal sounds..., moderately palatal sounds..., etc." (ibid). All these different g- sounds in German are regarded as realizations (i.e. variants) of one and the same phoneme, viz. /g/, because each of them contains, in addition to the phonologically relevant features, a number of the phonologically irrelevant features which cannot be associated with phonemes. Our decision that all these phonetically different g- sounds in German are variants of the same phoneme is not arbitrarily made but based on opposition. In other words, if the opposition between the different g- sounds in German is distinctive (i.e. phonological), the respective sounds should be assigned to different phonemes. But this is not the case in German, i.e. the opposition between the different g- sounds is non-distinctive, and so the respective sounds should be considered as variants of the same phoneme /g/.<sup>(1)</sup> In his LSP, Vachek states that "the variants implementing the phoneme are mutually exclusive<sup>(2)</sup> as to their respective positions in concrete language contexts" (p.52) and as an example he mentions clear and dark l- sounds in modern English.

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(1) For the various methods of 'phonemic diagnosis', i.e. whether two or more sounds are assigned to one or more phonemes, see Chapter Five of this thesis.

(2) In connexion with 'mutual exclusion', Vachek (LSP, p.53) refers to what the Bloomfieldians call 'complementary distribution'. He writes:

Let us give a brief survey of the various Praguian views on variants (definition and classification). In accordance with the Russian tradition, the "Project" contains two types of variants: 'variante fondamentale' (i.e. fundamental or principal variant) and 'variante accessoire' (i.e. secondary variant); the former being least dependant on the environment and occupying the position of maximum differentiation (it is also said to be free from any emotional colouring). The term 'variante fondamentale' was used by Jakobson as early as 1929 (SW,1, p.15) but it was not contained in the later writings of the Prague group (not even in Principles). Furthermore, Jakobson (SW, 1, p.227) talks about 'optional variants' which occur in the same environment without giving rise to any change in word-meaning. On the other hand, 'combinatory variants' are said to occur in different environments but the exchange of one of them for another, again, is non-distinctive. He states that different sounds can be variants of the same phoneme depending on "the style of speech and/or on the phonetic environment in which the phoneme occurs" (p.231). He goes on to say that "the

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" This fact of mutual exclusion, viewed from a somewhat different angle, can be termed as 'complementary distribution' - this conception implies that a phoneme distributes, so to speak, its variants so as to fill; up all types of positions in which the said phoneme can occur. This aspect of the procedure has been particularly emphasized by the American scholars of the Bloomfieldian group who, indeed, made complementary distribution the pivotal idea of all linguistic analysis... they did this at the expense of other criteria commonly

difference between such sounds is determined by external factors and hence cannot serve to distinguish word meanings" (ibid).

On the other hand, Trubetzkoy (Principles..., pp.46-51) mentions two main types of variants: 'optional' and 'combinatory'. He notes that 'optional variants' "occur in exactly the same environment and are interchangeable without a change in the lexical meaning of the word" (p.46). Then he sub-divides optional variants (from the standpoint of their relation to the speech norm) into 'general' and 'individual' variants. 'General variants' are defined as "variants that are not regarded as speech defects or deviations from the norm and can therefore be used by the same speaker" (ibid); on the other hand, "individual variants..., are distributed among the various members of the speech community" (p.47). Only one of the latter type of variants is regarded as "normal", "good", or "model" pronunciation, while the rest are regarded as regional, social, or pathological deviations from the norm" (ibid). From the viewpoint of their function, 'optional variants' are sub-divided into 'stylistically relevant' and 'stylistically irrelevant' variants. The former serve to differentiate between different styles of speech, e.g. between an excited emotional style and a careless familiar style; the latter, by comparison, have no function at all, i.e. they can be inter-

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contd. from previous pages: . . . used by the Prague group, such as especially phonic similarity and distinctive functioning". (emphasis added)

changed "without any change in the expressive or the conative function of speech" (p.48).<sup>(1)</sup> 'Combinatory variants', the second major category of variants, are defined by Trubetzkoy (Principles..., p.49) as "two sounds of a given language, related acoustically or articulatorily, [which, A.R.] never occur in the same environment". Compared with some of the optional variants (viz. 'stylistically relevant' variants) which function on the appellative as well as the expressive planes), combinatory variants function on the representation plane only.<sup>(2)</sup>

Krámský (The Phoneme..., pp.35-37) gives a survey of Trnka's contribution to the phoneme theory: definitions of the 'phoneme' and 'variant', and types of variants. Krámský states that in a paper published in 1931<sup>(3)</sup> Trnka defined the 'phoneme' as "every sound that is capable of semantic differentiation" (p.35), and the 'variant' as "a sound not capable of semantic distinction and in the given language system it is identified with a certain phoneme" (ibid). In this paper, Trnka distinguishes two types of variants: main and secondary, and says that

(1) For examples of the various types of 'optional variants', see Trubetzkoy's Principles, pp. 46-48.

(2) For examples of 'combinatory variants', see ibid, pp.49f.

(3) See B. Trnka, "Těsnopisné soustavy a fonologie" [Shorthand Systems and Phonology], in Těsnopisné listy, 56 (nos. 5-8), 1931, pp. 29-39.

"for the understanding of speech only the main variants<sup>(1)</sup> are important which in the linguistic consciousness of speakers stand for a whole family of sounds" (ibid). For 'secondary variants' he distinguishes two subtypes: (a) 'combinatory' variants which are conditioned by neighbouring sounds, and (b) 'stylistic' variants which are peculiar to a certain style of speech. Krámský also refers to Trnka's monograph of 1935<sup>(2)</sup> where Trnka presents another set of definitions. In this monograph, Trnka defines 'phonemes' as "the fundamental linguistic oppositions which cannot be analyzed into smaller units" (p.5). On the other hand, 'variants' are defined as "the sounds by which a phoneme is phonetically realized" (ibid). In connexion with the types of variants, Trnka distinguishes the following: (a) 'combinatory' variants which are the phonetic realizations of a phoneme, which occur in exclusive positions, in each of which only one variant can be used" (ibid); and (b) 'stylistic' variants which are "substitutes of the normal sounds according to different styles or modes of the language" (p.6). If they occur only in some of the combinations in which the phoneme occurs, they are called 'stylistic combinatory variants'.

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(1) Since the above article was published in Czech and Krámský does not give any explanation of the term 'main variant', no accurate explanation can be offered here. However, my guess is that this term corresponds to what is known to non-functionalists as the "principal allophone".

(2) See B. Trnka, A Phonological Analysis of Present-Day Standard English, Prague 1935, pp.5f, see also its revised new edition (Tokyo, 1966) pp.3-6.

In a 1937 article,<sup>(1)</sup> furthermore, Trnka states that "the difference between sounds having functional validity (phonemes) and sounds without functional validity (variants) is a linguistic fact observed not only by our linguistic consciousness but also by morphological analogy which always interferes with phonemes only". In a paper published in 1939,<sup>(2)</sup> Trnka writes:

"...we must first point out that the phonetic realization of secondary combinatory variants is dependent on their phonetic neighbourhood, that is to say, secondary combinatory variants are mostly realized by products of a complete assimilation of the place or other relevant features of the articulatory complex representing a phoneme."(p.25)

In addition, in his 1954 article mentioned on page 59 (i.e. "Určování... cit;") Trnka says, and I quote Krámský's English wording (see The Phoneme..., p.67), that "the sounds that possess the same sum of relevant features and simultaneously different irrelevant features, are positional variants (e.g. the nasals n and ŋ in Czech)".

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(1) See B. Trnka, "Význam funkčního jazykozpytu pro vyučování moderním jazykům" [On the Importance of Functional Linguistics for Modern-Language Teaching], Slovo a Slovesnost, 3, 1937, pp.236-241. The English wording to be quoted is found in Krámský, op.cit., p.37.

(2) See B. Trnka, "On the Combinatory Variants and Neutralization of Phonemes" in P.3rd ICPS, Ghent, 1939, pp.23-30.

Krámský also makes reference to an article Vachek published in 1933,<sup>(1)</sup> where Vachek distinguishes two types of variants, namely fundamental and combinatory. Vachek goes on to define these terms by saying that "the fundamental variant of a phoneme is that sound of the group whose dependence upon the neighbouring phonemes in the context is least; the combinatory variants, on the contrary, appear to be limited to (or, less precisely, conditioned by) a specific phonic environment" (p.83).

Martinet (Elements..., pp.66-68) expresses his views on 'variants' which are, in my opinion, representative of neo-Praguan thought.<sup>(2)</sup> We read:

"We speak of combinatory or contextual variants 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 is the case in Spanish for [ð] and [d], to non-identical descriptions. ....To say that a phoneme has no variants or that it has two, three or more, is to make

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(1) See J. Vachek, "What is Phonology?" in English Studies, 15, 1933, pp. 81-92; see also LSP, p.51.

(2) On the neo-Praguan views on types of variants, see also T. Akamatsu, "Variétés", in La linguistique, guide alphabétique, Denoël, Paris, 1969, pp.386-392.



the mistake of transposing reactions peculiar to the describer into the system of the language under description. ...The combinatory variants of a given phoneme are said to be in complementary distribution. ...There are other phoneme variants than combinatory variants. The French phoneme /r/ is 'throaty' with some speakers and 'rolled' with others. We then speak of individual variants. In the case of the actor who 'rolls' his r's on the stage but uses the 'throaty' pronunciation elsewhere, we may rather speak of 'optional' variants.. But variations may also be conditioned. There are some French people who use the rolled /r/ in très and the throaty variety in fer, that is why they exhibit individual variants with a combinatory conditioning." (emphasis added)

The functional views on 'variants' and their types have been summarized or presented by linguists who are not pure functionalists. For example, B. Malmberg<sup>(1)</sup> distinguishes two types of variants: combinative and free variants. He goes on to say that "if the choice of a certain variant of phoneme is automatically conditioned by certain phonetic rules,

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(1) See the chapter entitled 'Phonology and the Prague School' in Malmberg's New Trends... cit, pp. 74-97.

the variant is called combinative. ...Variants other than combinative are free" (p.79).

On the other hand, Fischer-Jørgensen,<sup>(1)</sup> too, makes reference to variants. She distinguishes two types of variants: combinatory and facultative variants. She remarks that the former occur in different environments and the latter, on the contrary, occur in the same phonetic environments.

In conclusion, I think that phonemes can be realized by two main types of variants: combinatory and optional variants.<sup>(2)</sup> Combinatory variants are conditioned by phonetic context, whereas optional variants are not conditioned by phonetic context and so can occur in the same phonetic contexts contrary to combinatory variants which can never occur in the same phonetic contexts. Moreover, combinatory variants are said to be in complementary distribution. A final word must be said. What is characteristic of all variants is that they bear no distinctive value, i.e. they do not affect the meaning of the given words if interchangeably used in a given language.

(1) See Eli Fischer-Jørgensen, Trends... cit, p.25.

(2) By 'optional variants' I mean 'free' as well as 'stylistic' variants (whether stylistically relevant or stylistically irrelevant); see Chapter Nine of this thesis. On 'free variation' between realizations of different phonemes, see sections 13.6 - 13.17 of this thesis.

### 3.5. Implication of the Previous Notions in Saussure's Course.

If one reflects on what Saussure says concerning what he calls 'linguistic identity' and 'linguistic entity', one feels inclined to relate these terms to what are in Prague terminology, called 'phoneme' (and in turn 'phonemic content'), 'variant' and 'relevant feature'. It is not quite a one-to-one relationship. In this connexion, I am particularly referring to Saussure's examples of the two "8.25 p.m. Geneva-to-Paris" trains that leave at twenty-four-hour intervals' (Course, p.108) and the street that is demolished and rebuilt but is still said to be the same (see Course, pp. 108f). Let us first see what Saussure says in connexion with these two examples and then draw our conclusions in functional phonological terms.

As regards the example of trains, Saussure writes: "We feel that it is the same train each day, yet everything - in the locomotive, coaches, personnel - is probably different" (p.108). This is so, Saussure thinks, because both trains share the same hour of departure, route, and frequency of service which pertain to the identity of the train. The functional phonological interpretation of this example can be expressed as follows: people usually think of trains as a means of transportation which serves to take them from one place to another according to a fixed time-table which shows the time of departure and arrival, route and frequency of service. That is to say, what people think of is something having those features that pertain

to the real function of a particular train. By means of these features, a certain train is distinguished from all other trains that have completely different features. To be more specific, this particular train is, functionally speaking, the only one that has all the features mentioned above. Since these features serve as the distinctive properties (or characteristics) that keep the respective train distinct from all the other trains in the same system (i.e. the system of passenger trains), they can, phonologically speaking, correspond to what functionalists would call 'relevant features'. The analogy would be as follows: the "8.25 p.m. Geneva-to-Paris" train constitutes a distinct member (i.e. a phoneme) of the system of passenger trains (i.e. the respective phonological system). It follows that any other train (in a concrete sense) that has, among other features, all the relevant features established above (which constitute the 'phonemic content' of the established phoneme) is to be regarded as a realization (i.e. variant) of the same phoneme established above. Since the two trains mentioned by Saussure have the same sum of relevant features, they are considered, from a functionalist point of view, as two variants of the same phoneme. According to the above definitions of variants, variants can, in addition to the phonologically relevant features, have other features that are phonologically irrelevant and which do not pertain to the distinctive function of the corresponding phonemes. With regard to the actual example cited by Saussure, I can say that the locomotive,

coaches, personnel, etc. are but irrelevant features insofar as the identity (i.e. the functional identification of the train) is concerned.

The above argument can be given in connexion with Saussure's example of the street (being demolished and rebuilt but still said to be the same street). Concerning this example, Saussure remarks that it is still thought of as "the same street even though in a material sense, perhaps nothing of the old one remains" (Course..., p.108). He goes on with his example as follows:

" Why can a street be completely rebuilt and still be the same? Because it does not contribute a purely material entity it is based on certain conditions that are distinct from the materials that fit the conditions, e.g. its location with respect to the other streets... Whenever the same conditions are fulfilled, the same entities are obtained".(pp. 108f).

By analogy with the "8.25 p.m. Geneva-to-Paris train" example, the respective street (in the abstract sense) can correspond to a phoneme (i.e. a linguistic entity) which is characterized by the conditions (i.e. relevant features) that set it apart from all the other streets of the system of streets (i.e. from all the other phonemes of the given phonological system). The

original street and the new one can be thought of, from a functionalist point of view, as two variants of the same phoneme established in the system because they have the same relevant features (e.g. the location of the street in relation to other streets, etc.). Being variants of one and the same phoneme, they can have some irrelevant features such as the materials used for the original street as opposed to those used for the new street which may be completely different.

In conclusion, notions like 'linguistic identity' and 'linguistic entity' gave the Praguians food for thought which gave rise to what they later called 'phoneme', 'phonemic content', 'variant' and 'relevant features'.

## Chapter Four

BASIC FUNCTIONAL NOTIONS - (B)4.1. Syntagmatics/Paradigmatics and Contrast/Opposition.

Saussure's dichotomy syntagmatic/associative (i.e. paradigmatic) <sup>(1)</sup> has been utilized by functionalists in connexion with the functional dichotomy contrast/opposition. The functional conception of the terms 'syntagmatic', 'paradigmatic', 'contrast' and 'opposition' can be explained by means of the following comparison:

In a game of scrabble (as in a cross-word puzzle), each letter joins with the other letters available in the game on two axes: horizontal and vertical. For example, the letter 'R' in the formation

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      F
      A
H O R N
      M

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joins with the letters 'H', 'O', and 'N' on the horizontal axis, and the letters 'F', 'A', and 'M' on the vertical axis. In the system of language, on the other hand, a similar sort of relation exists between linguistic units, whether signs or

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(1) The terms 'syntagmatic' and 'associative' were coined by Saussure (see Course..., pp. 122f, 128f, 130f and 136f). But the term 'paradigmatic' was coined by L. Hjelmslev to replace Saussure's psychologistic term 'associative'. The term 'paradigmatic' has been in common use by functionalists (in the

phonemes. (1) On the horizontal axis, on the one hand, a given phoneme has a relation with the other phonemes of the same word and this is called a 'syntagmatic' relation. The characteristic of a syntagmatic relation is that it is a relation of presentia and the nature of it is that of 'contrast'. For example, the phoneme /a/ in the SIA word /dɑr/ 'house' is in contrast with the other phonemes of the same word, viz /ɑ/ and /r/, and the relation between them is said to be syntagmatic. On the vertical axis, on the other hand, there exists a relation between a given phoneme (in a given word) and those phonemes (of the same phonemic system) that can replace it at the same point of the spoken chain. This relation is a relation of absentia which is called a 'paradigmatic' relation. If, as a result of replacing a given phoneme by another at the same point of the spoken chain, the meaning of the original word changes into another, the respective phonemes are said to be in 'opposition' with each other. For example, the phoneme /a/ in the SIA word /dɑr/ 'house' is said to be in opposition with phonemes like /g/, /b/, etc. which can replace it in the structure /-ɑr/

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contd. from previous page:- sense to be introduced later in this section) ever since it was coined by Hjelmslev at the Second International Congress of Phonetic Sciences (London, 1935) in his paper "On the Principles of Phonematics", in P2nd ICPS, Cambridge, 1936, pp. 49-54.

(1) Since the aim of the present research is 'phonematics', I shall only deal with relations between phonemes occurring in words.



giving rise to the new words /ǵar/ 'neighbour', /bar/ 'bar for drinking', etc. The nature of the relation between /d/ and /ǵ/ or /d/ and /b/ in the above examples is said to be paradigmatic. The same sort of relation exists between the phoneme /a/ in the SIA word /dar/ and /o/ in /dor/ 'role', /u/ in /dʊr/ 'pearl(s)', etc. (similarly between /r/ in /dar/ and /s/ in /das/ 'he trod', /x/ in /dax/ 'he felt dizzy'). To recapitulate, we only talk about 'contrasts' when the respective relations are syntagmatic, and 'oppositions' when the respective relations are paradigmatic. That is to say, syntagmatic relations are designated as 'contrasts' whereas paradigmatic relations are designated as 'oppositions' whenever a semantic change is involved. This conclusion must be emphasized since some non-functionalists scholars use 'contrast' and 'opposition' synonymously.<sup>(1)</sup>

The concepts of syntagmatic, paradigmatic, contrast and opposition are of prime importance in functional phonology. They are particularly important for establishing phoneme inventories and subsequently classifying the established phonemes according to their relevant features, which is the main aim of a phonematic analysis. The importance of these notions will be revealed if we follow the procedure which the phonologist uses to arrive at a phonological description of the language (or dialect) he is working on. The procedure to

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(1) See, for example, Fischer-Jørgensen, Trends..., especially p. 20.

be followed in a phonematic analysis is, in my view, determined by whatever definition of the phoneme we operate with. In my phonematic analysis of SIA, Trubetzkoy's definition of the phoneme (contained in his Principles..., p.36) is adopted to the effect that the classification of the SIA phonemes will be based on 'relevant features' which constitute the very essence of Trubetzkoy's definition. As stated before, the sum of the relevant features of a given phoneme constitutes its phonemic content arrived at by means of opposition. This indicates that any feature of a given phoneme cannot be considered 'relevant' unless it helps to keep that phoneme distinct from all the other phonemes of the given phonemic system to which it is opposed. The sharp distinction (made by the Praguians and adopted by me) between the notions of 'variant' and the 'phoneme' is, in my opinion, the 'dynamo' whereby speech sounds are transmuted into a phoneme inventory. This distinction forms the principle according to which Trubetzkoy's rules (for determining phonemes) have been formulated (see Principles..., pp.46ff). The 'commutation (or substitution) test' is the method Trubetzkoy implicitly uses for determining the phonemes (and their variants) of a given language, and is, by definition, based on the notion of 'opposition'. Though Trubetzkoy's rules are, in fact, said to be based on 'opposition', RULE IV is based on syntagmatic relations (i.e. on contrasts) as is explicit in the wording of the rule where Trubetzkoy states that the respective sounds "can occur next to each other..." (Principles...,

p.50).<sup>(1)</sup> In most cases, a phoneme inventory of a given language (or dialect) can be established by means of applying Trubetzkoy's rules which are based on the notions of contrast, opposition, syntagmatic and paradigmatic.

Not only are these notions useful for the establishment of a phoneme inventory (i.e. the first task of a phonematic analysis), but also the systematization<sup>(2)</sup> of the established phoneme inventory (i.e. the second task of a phonematic analysis). By 'systematization' is meant 'paradigmatic systematization' which classifies the established phonemes into groups each of which is characterized by one or more relevant features which are different from those characterizing the other groups (e.g. one group of phonemes characterized by the relevant feature "voiceless", another group characterized by the relevant feature "voiced", and so on). This systematization (i.e. classification) is said to be 'paradigmatic' as it is based on what phonological (i.e. distinctive) oppositions there are between the members of the established phoneme inventory. Since the systematization of the phoneme inventory is based on relevant features, opposition

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(1) See Martinet's 1946 review of Trubetzkoy's Grundzüge..., (in BSL, 42, pp. 23-33) where RULE IV is invalidated.

(2) The concept of 'systematization' was coined by Martinet as early as 1937 in his doctoral thesis on Danish (in BSL, 38/113, pp. 169-266). See also (a) Martinet, La description phonologique..., cit, pp. 80ff, (b) J.W.F. Mulder, "Phoneme-Tables and the Functional Principle," in La linguistique, 14/1, 1978, pp.3-27, and (c) Chapter Eleven of this thesis.

once again proves to be the criterion to be applied. Once the systematization of the established phoneme inventory is achieved, it can then be represented by means of tables or diagrams of the 'series-and-order' type.<sup>(1)</sup> For example, the phonologist may come to the conclusion that the English phonemes /p/, /t/ and /k/ should be grouped together on the grounds that they have the relevant features "voiceless", "non-nasal" and "plosive" in common. Similarly, their "voiced" counterparts /b/, /d/ and /g/, respectively, should be grouped together as they share the relevant features "voiced", "non-nasal" and "plosive". Another systematization of the English phonemes might group /p/ with /b/ and /m/; /t/ with /d/ and /n/; /k/ with /g/ and /ŋ/, and so on, on the basis that the members of each group share the same property of place of articulation which is different from that of the members of the other groups, i.e. "labial" as distinct from "apical" and "velar" respectively.

From what I have said above, it is clear that the notions of contrast, opposition, syntagmatic and paradigmatic are very necessary in phonological description in general. I wish to emphasize the fact that of these notions, 'opposition' (which designates paradigmatic relations) is, in my opinion, the basic notion in phonology.

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(1) The 'series-and-order' diagrammatical representation of phonemic systems is usually associated with Martinet, see his *Elements...*, pp. 65f. See also F. François, "La description Linguistique," in *Le Langage, encyclopédie de la Pléiade* (edited by A. Martinet), Paris, 1968, pp. 171-227 (esp. pp. 201-204). Furthermore, Martinet's terms 'series' and 'order' are

#### 4.2. Opposition.

As noted above, 'opposition' is one of the most fundamental notions that functionalists operate with, yet it is frequently confused (by non-functionalists) with that of 'contrast'. It is important to point out that "the concept of distinctiveness presupposes the concept of opposition" (Principles..., p.31) and so the latter concept should be restricted to cases where a phonic change (in a moneme) results in a meaning difference. In other words, opposition concerns itself with paradigmatic relations between the sounds of a particular language (or dialect) in certain contexts. A paradigmatic relation involves a given sound in a given context and other sounds (of the same language or dialect) that may figure in the same context, and so this type of relation is said to be a relation of absentia. Such are the relations "which we conceive as existing between units which may figure in a given context and which, at least in this context, are mutually exclusive" (Elements..., p.36). That is to say, opposition between phonemes "implies incompatibility at a given point" (ibid, p.100). For example, the SIA phoneme /b/ as in /baɾ/ 'drinking bar' is opposable to /d/ at this particular point of the spoken chain as in /daɾ/ 'house', but it does not exclude it in a neighbouring position, hence the SIA word /'baɾaɾ/ 'he took the initiative(to do something)'.

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contd. from previous page:... substituted by 'row' and 'column' respectively, in G.C. Lepschy, "The Segmental Phonemes of Venetian and their Classification", in Word, 19, New York, 1963, pp. 53-66 (esp. pp. 59f).

In brief, by 'opposition' is meant 'phonological (i.e. distinctive) opposition' which mainly concerns the sounds of a particular language at a particular point of the spoken chain.

#### 4.3. The Principle of Relevance<sup>(1)</sup>

In the previous section, we have seen that the concept of opposition can only involve sounds (of a given language or dialect) at a particular point of the spoken chain. In the course of discussing this matter, what Martinet terms the 'principle of relevance' (or 'principe de pertinence' in French) comes in as it is necessary to specify the positions in which a given phonological opposition is relevant (or valid) in addition to those positions where the respective opposition is invalid. Let us examine the p/b opposition in English. In word-initial position, for example, the p/b opposition is valid as in /pat/ vs. /bat/; it is also relevant in word-final position, as in /kap/ vs. /kab/, and before /r/ as in /prik/ vs. /brik/. Each of these positions is called a 'position of relevance'<sup>(2)</sup> since there are, in the

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(1) In fact, 'relevance', in functional linguistics, does not only relate to 'distinctiveness', but in this section I shall deal with the principle of relevance insofar as it relates to the notion of 'distinctiveness' only.

(2) For detail on the notions of the 'position of relevance' and the 'position of neutralization', see Trubetzkoy's Principles ..., pp.78ff, 84 and 265.

English language, minimal pairs based on the p/b opposition in those positions. On the other hand, the opposition between the English phonemes /p/ and /b/ fails to operate after /s/, i.e. in the context /s—/. This position is, in functional terminology, called the 'position of neutralization' since we cannot find any minimal pairs involving the two phonemes /p/ and /b/ in this position. In other words, we can say [spik] but not \* [sbik].<sup>(1)</sup>

#### 4.4. Exclusive Relation

Two phonemes are said to be in 'exclusive relation' if (a) they are distinguished from each other by only one pair of relevant features, and (b) they are alone, in the language system, to share the relevant features that are common to them.<sup>(2)</sup> In SIA, for example, /b/ and /p/ are in exclusive relation because on the one hand they are distinguished from each other by the presence or absence of voicing respectively (i.e. "voiced" vs. "voiceless"), and, on the other hand, they are the only phonemes in the SIA phonemic system that share the relevant features "labial", "non-nasal" and "stop". But /b/ and /d/ are

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(1) I shall be saying more about the phonological interpretation of the English opposition between /p/ and /b/ after word-initial /s/. See sections 4.9 and 4.11 of this thesis.

(2) This is Martinet's conception of 'exclusive relation' contained in his (a) La description phonologique... cit, p.41, (b) "Où en est la phonologie?" in Lingua, 1, 1947, pp. 34-58 (esp. p.49), and (c) Phonology as Functional Phonetics... cit, p.7. Although Martinet says 'Two phonemes...', it is clear from his subsequent explanation of his definition that more than two phonemes can be in exclusive relation.

not in exclusive relation because although they are distinguished from each other solely by the relevant features "labial" vs. "apical", they are not the only SIA phonemes that share the relevant features "voiced", "non-nasal" and "stop", since these relevant features are also shared by /g/.

#### 4.5 'Correlation' and 'Mark of Correlation'.

All the pairs of phonemes that are in exclusive relation, and are furthermore, distinguished from each other by the presence or absence of the same relevant feature, form what is called a 'correlation'. In SIA, for example, the pairs /b/ and /p/, /d/ and /t/, /g/ and /k/, /ǵ/ and /č/, /ǰ/ and /θ/, /ɣ/ and /x/, /z/ and /s/, and /ʕ/ and /ħ/ are in exclusive relation and what distinguishes /b/ from /p/, /d/ from /t/, etc. is the presence versus absence of voicing, respectively (i.e. "voiced" vs. "voiceless"). These pairs of phonemes form a correlation of voicing. Voicing is, in this case, called the 'mark of correlation'. A 'correlation mark' (i.e. 'mark of correlation') is conceived by Trubetzkoy as "a phonological property whose presence or absence characterizes a series of correlation pairs" (Principles..., p.85).<sup>(1)</sup> Thus, a correlation can be conceived as "the sum of all correlation pairs characterized

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(1) In connexion with the notion of the 'mark', I agree with T. Akamatsu, among other functionalists, that it is "a phonic property pure and simple and... its presence and absence create two relevant features", see T. Akamatsu, "On the Notion of the



by the same correlation mark" (Principles ..., p. 85).<sup>(1)</sup>

Meanwhile, a 'correlation pair' is defined as "two phonemes that are in a relation of logically privative, proportional, bilateral opposition with each other" (ibid, p. 84).<sup>(2)</sup>

#### 4.6 The Archiphoneme

In view of the above definition of 'exclusive relation', it is to be understood that the sum of the relevant features common to two (or more) phonemes which are in exclusive relation is called an 'archiphoneme'. This means that only those phonemes that stand in exclusive relation can form an archiphoneme (see Martinet's La description phonologique ... cit, p. 42).

The notion of the 'archiphoneme' was used for the first time in 1929. It was proposed by R. Jakobson in his Remarques ... cit, where the concept was made explicit and given a term.

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contd. from previous page:- "Mark in Phonology", in Actes du 4ème Colloque International de Linguistique Fonctionnelle (Oviedo 26-30 Juillet 1977), Universidad de Oviedo, 1978, pp. 141-145 (esp. pp. 142f).

(1) A French wording of this definition is found in Martinet's La linguistique synchronique ... cit (p. 131), where 'correlation' is defined as "l'ensemble de toutes les paires corrélatives qui sont caractérisées par la même marque de corrélation".

(2) For Trubetzkoy's conception of a 'logically privative, proportional, bilateral opposition', see Principles ... pp. 67ff and section 6.3 of this thesis.

We read (TCLP, 2, pp.8f and SW, 1, p.12):

"...nous pouvons dégager une entité nouvelle, essentielle pour la phonologie, à savoir l'archiphonème. L'archiphonème, d'une part, n'est pas susceptible d'être subdivisé en oppositions de phonèmes disjoints plus menues, et d'autre part ne saurait posséder avec un autre archiphonème un substrat commun isolable par la conscience linguistique, c'est-à-dire que l'archiphonème ne saurait être corrélatif d'un autre archiphonème. L'archiphonème est une idée générique, c'est une unité abstraite, qui peut unir un ou plusieurs couples de variantes corrélatives (de phonèmes corrélatifs)."

The archiphoneme as a 'unit' was implied in "Propositions" (1928), where we read:

"Une corrélation phonologique est constituée par une série d'oppositions binaires définies par un principe commun qui peut être pensé indépendamment de chaque couple de termes opposés." (SW, 1, p.3)

In the "Projet" of 1931, the 'archiphoneme' was defined as an "élément commun de deux ou plusieurs phonèmes corrélatifs, qu'on peut concevoir abstraction faite des propriétés de corrélation"

(TCLP, 4, p.315). In 1962, furthermore, Jakobson defined the 'archiphoneme' as "the common core of two phonemes within a correlated pair" (SW, 1, pp. 634f).

All the above definitions show that the 'archiphoneme' concept is bound up with the concept of 'correlation'. Trubetzkoy's first mention of the 'archiphoneme', on the other hand, occurred in 1929, where Trubetzkoy relates the 'archiphoneme' to his own expression 'Phonemennester' (i.e. 'phoneme nests' in English). He writes:

"Hinter einem solchen Phonemenneste steht immer eine ziemlich verschwommene, von allen korrelativen Eigenschaften freie, Lautvorstellung... für den Roman Jakobson den Ausdruck "Archiphonem" vorschlagt."<sup>(1)</sup>

In a 1931 article Trubetzkoy<sup>(2)</sup> adopts Jakobson's conception of the 'archiphoneme' and defines it as 'a general sound concept (Lautbegriff)' abstracted from the qualities of a correlation. In his Principles, furthermore, Trubetzkoy redefines the 'archiphoneme' as "the sum of distinctive properties that two phonemes have in common" (p.78). For example, the sum of the relevant

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(1) N.S. Trubetzkoy, Polabische Studien (= Sitzungsberichte der Wissenschaften in Wien, Philosophisch-historische Kl. Bd. 211, Abh. 4), Wien, 1929, p.133.

(2) See N.S. Trubetzkoy's "Die phonologischen Systeme", in TCLP, 4, 1931, pp.96-116 (esp. p.98).

features common to the SIA phonemes /p/ and /b/, viz. "labial", "non-nasal" and "stop", forms the archiphoneme which occurs in the position where the p/b opposition is neutralized in SIA.<sup>(1)</sup> In addition, this archiphoneme is, according to Martinet's theory (see his La linguistique synchronique..., p.42), said to be in exclusive relation with the SIA phoneme /m/ as they are distinguished from each other by the absence and presence of 'nasality', respectively (i.e. "non-nasal" vs. "nasal") and they alone share the relevant feature "labial" only.

Martinet, too, deals with the concept of the 'archiphoneme' in his Elements, among his other works, where he says:

"If the phoneme is defined as the sum of the relevant features, the archiphoneme is the sum of the relevant features common to two or more phonemes which alone present them all." (p.69)

In a 1936 article, furthermore, Martinet<sup>(2)</sup> suggests that the

(1) See Section 13.2 of this thesis.

(2) See Martinet's "Neutralisation et archiphonème", in TCLP, 6, 1936, pp. 46-57. In his "Où en est la phonologie?...cit," furthermore, Martinet suggests that the 'archiphoneme' should be abandoned altogether, but he uses it in his later writings (e.g. in Elements..., pp.68-71). Vachek, too, rejects the concept of the 'archiphoneme'. He writes:

"... the concept of archiphoneme has no justification... it is hardly chance that since Trubetzkoy's Grundzüge this term has been virtually abandoned in phonological books

archiphoneme should be restricted to cases where there is neutralization. To both Trubetzkoy and Martinet, therefore, the concept of the 'archiphoneme' is bound with the concept of 'neutralization'.<sup>(1)</sup>

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contd. from previous page:- and papers by the Prague group - this has obviously been due to its unfruitfulness."(LSP, p.62)

The controversy about the concept of the 'archiphoneme' has recently taken the shape of a series of articles initiated by E. Buysens in 1972. See (a) E. Buysens, "Phonème, archiphonème et pertinence", in La linguistique, 8/2, 1972, pp.39-58, (b) R. Vion, "Les notions de neutralisation et d'archiphonème en phonologie", in La linguistique, 10/1, 1974, pp.33-52, (c) E. Buysens, "A propos de l'archiphonème", La linguistique, 11/2, 1975, pp. 35-38, (d) T. Akamatsu, "Peut-on dissocier "neutralisation" et "archiphonème"?" in La linguistique, 12/2, 1976, pp. 27-32, and (e) E. Buysens, "A propos de l'archiphonème", in La linguistique, 13/2, 1977, pp.51-54. Akamatsu's reply to Buysens (1977) is forthcoming. In addition, see E. Buysens, "Contre la notion d'archiphonème", in P.11th ICL, Bologna, 1974, pp. 765-768.

(1) For a detailed account of the concepts of 'neutralization' and the 'archiphoneme', see Niels David-Nielsen, Neutralization and Archiphoneme: Two Phonological Concepts and their History, Copenhagen, 1978 (esp. Chapters 1 and 2). On the notion of 'archiphoneme' see also T. Akamatsu, "The Functional Level of Archiphoneme" in P.7th ICPS, Mouton, 1972, pp. 1067-1074.

#### 4.7. Neutralization.

The Praguians and the glossematicians have been influenced by Saussure who attaches a great deal of importance to oppositions in language. Neutralization, which is a consequence of the application of the concept of 'opposition' is, therefore, very important to the Praguians (and subsequently the neo-Praguians) as well as the glossematicians.<sup>(1)</sup> The concept of 'neutralization' was first used by Trubetzkoy in his Polabische Studien (1929)<sup>(2)</sup> and later in his article "Die phonologischen Systeme"... cit. However, the advent of neutralization could clearly be anticipated but had not yet been used in Polabische Studien. We read:

"Somit wird ein Phonem nicht immer mit derselben Deutlichkeit gedacht. Es gibt Stellungen in denen alle Eigenschaften eines Phonems in Sprachbewusstsein deutlich hervortreten; in anderen Stellungen verblässen einigen Eigenschaften desselben Phonems und werden nur ganz undeutlich perzeptiert." (pp.125f)

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(1) Fischer-Jørgensen (Trends..., footnote 11 on p.29) states that Isačenko (see his "Hat sich die Phonologie überlebt?" in Zeitschrift für Phonetik, 9, 1956, pp. 329-330) is an exception. The term 'neutralization' is also used by non-functionalists (e.g. generativists and stratificationalists) but in a different sense from that of the functionalists. For a brief account of this, see Fischer-Jørgensen, ibid.

(2) Jakobson (SW, I, p.314) states that the first linguist to broach the problem of neutralization is N. Durnovo in 1927.

A detailed account of neutralization is found for the first time in Trubetzkoy's 1936 article<sup>(1)</sup> and in Martinet's article of the same year.<sup>(2)</sup> Furthermore, the concept of 'neutralization' was further elaborated in Trubetzkoy's Grundzüge (1939).

#### 4.8. Definitions and Types of Neutralization.

As stated in section 4.3 above, the positions where a given opposition is neutralized are said to be the positions of neutralization. In my opinion, neutralization designates the non-validity of a given phonological opposition in certain positions where neither of the opposition members (i.e. phonemes) occurs. In other words, phonological oppositions are said to be 'neutralizable' if there are contexts in which they cease to be relevant. Oppositions that are always relevant are known as 'constant' oppositions (see section 6.3 of this thesis). B. Trnka<sup>(3)</sup> defines 'neutralization' as the suppression of 'conjunct' oppositions<sup>(4)</sup> in some of their positions in the word, and amends Trubetzkoy's interpretation of neutralization by means of the archiphoneme to which both members of a neutralizable

(1) N.S. Trubetzkoy, "Die Aufhebung der phonologischen Gegensätze", in TCLP, 6, 1936, pp. 29-45 (reprinted in PSRL, pp. 187-205).

(2) A. Martinet, "Neutralisation et archiphonème"...cit.

(3) See B. Trnka, A Phonological Analysis of Present-Day Standard English (revised new edition), Tokyo, 1966.

(4) A 'conjunct opposition' is a phonological opposition the members of which are distinguished from each other by one and only one relevant feature; see ibid, p.12. See also section 6.3 of this thesis.

opposition are reduced as a result of the suppression of the relevant feature distinguishing them.<sup>(1)</sup> According to Trnka's definition, neutralization implies the exclusion of one of the opposition members from its phonetic environment. Trnka refers to the variant which realizes the archiphoneme in the position of neutralization as the 'neutralization variant'.<sup>(2)</sup> In Trnka's opinion, the role of neutralization in language "is to restrict the distribution of some phonological oppositions and to concentrate them to smaller contextual contrasts by making them incompatible with some specific positions and environments in the word".<sup>(3)</sup>

Trubetzkoy<sup>(4)</sup>, on the other hand, distinguishes two types

(1) See Krámský, The Phoneme... cit, p.70.

(2) Jakobson, too, talks about the realization of the archiphoneme in his Remarques...cit, where he calls it 'variante fondamentale'. We read:

"Nous appelons variante fondamentale d'un phonème (ou, respectivement, d'un archiphonème) celle des variantes combinatoires extragrammaticales (ou corrélatives) de ce phonème (ou de cet archiphonème) qui se trouve dans la plus faible dépendance des conditions extrinsèques et qui se réalise dans les conditions de la différenciation quantitativement la plus grande et la plus nette des phonèmes (ou archiphonèmes) de la langue. La variante qui se trouve dans la plus faible dépendance des conditions extrinsèques est celle qui se rencontre dans les circonstances les plus variées..." (SW, 1, p.15 and TCLP, 2, p.11).

(3) B. Trnka, op.cit, p.31.

(4) See Trubetzkoy's (a) Principles..., pp. 228-241, and (b) "Die Aufhebung..."cit for a detailed account of the types of neutralization.



of neutralization: (a) context-determined neutralization which is dependent on the neighbouring phonemes, and (b) structure-determined neutralization which is conditioned by position in a word, a syllable, or an accent. The neutralization of the opposition between distinctively "voiced" and distinctively "voiceless" consonants before fricatives and stops in Russian is an example of context-determined neutralization, whereas the neutralization of the opposition between distinctively "voiced" and distinctively "voiceless" consonants in final position in German and Russian is an example of structure-determined neutralization.

#### 4.9. The Pre-requisites of Neutralization.

It is generally agreed among functionalists that 'exclusive relation' is the basic condition for the members of a given opposition if that opposition is to be regarded as neutralizable. Neutralization is to be thought of as a phonological phenomenon which is likely to reveal itself during the process of examining the validity of the oppositions between the phonemes of a given phonological system. In other words, neutralization should only be related to phonological oppositions and not to phonemes nor to relevant features,<sup>(1)</sup> as I

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(1) Fischer-Jørgensen (Trends..., p.30) seems to think that neutralization takes place between phonemes. On the other hand, Martinet (at least in Lingua, 1, pp.48f) believes that neutralization takes place between distinctive (i.e. relevant) features. I understand Martinet's view to mean that neutralization is the disappearance of the relevant feature which forms the mark of correlation between the members of a given phonological

think that one would normally talk about a phonological opposition being neutralized in certain positions (called the positions of neutralization). Trubetzkoy thinks, rightly in my opinion, that the members of a neutralizable opposition must share relevant features which do not occur together in other phonemes. For example, the English phonemes /p/ and /b/ share the relevant features "bilabial" and "non-nasal" which together are not possessed by any of the other English phonemes which is why neutralization is possible for the p/b opposition in certain positions, viz. after word-initial /s/. On the other hand, the opposition between the English phonemes /p/ and /t/, for example, can never be regarded as neutralizable because the relevant features "voiceless" and "non-nasal" common to both /p/ and /t/ are also possessed by /k/. Trubetzkoy's conclusion is, therefore, that neutralization can only occur with bilateral oppositions, which means that not all examples of non-validity of phonological oppositions in certain contexts are considered as cases of neutralization. Martinet (Elements...,p.70), on the other hand, believes that neutralization is also possible in the case of what Trubetzkoy calls multilateral oppositions as long as the opposition between all the members of the respective opposition is neutralized -

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contd. from previous page:- opposition in the position of neutralization, e.g. the suppression of the relevant feature of "voicing" from the opposition between /b/ and /p/ after initial /s/ in English.

Martinet never operates with the concept of 'multilateral opposition').<sup>(1)</sup> As an example of such neutralization, Martinet mentions the neutralization of the opposition between the three Spanish nasal phonemes /m/, /n/ and /ɲ/ in syllable-final position "where the choice of the sounds [m], [n], [ɲ] and [ŋ] is indicated by the context and is subject to the choice of the speaker". For example, the nasal at the end of the word gran is realized as [m] in gran poeta, as [n] in gran torero, as [ɲ] in Gran Chaco and as [ŋ] in gran conquistador. In this example, [m], [n], [ɲ] and [ŋ] are realizations of the archiphoneme occurring in syllable-final position of the opposition between /m/, /n/ and /ɲ/. According to Martinet, therefore, neutralization exists wherever an archiphoneme is realized. Trnka,<sup>(2)</sup> furthermore, thinks that neutralization should be the result of a structural law in the language. For instance, distinctively "voiced" and "voiceless" consonants in Czech are neutralized in all cases except before phonemes which do not form part of the 'voicing' correlation, e.g. *ta/da*, *tr/dr*, etc. Consequently, the non-validity of the English opposition m/n before /ʒ/, /tʃ/ and /dʒ/ is not considered as a case of neutralization as they are opposed to each other before /ʃ/ and /s/.

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(1) I wish to point out that a 'multilateral opposition' does not involve more than two phonemes; in fact the two members of a multilateral opposition have some relevant features in common which are also possessed by one or more other phonemes in the system, e.g. the opposition between English /m/ and /n/ since /ɲ/ possesses the relevant feature "nasal" which is common to /m/ and /n/.

(2) See Trnka's "Die Phonologie in tschechisch und slovakisch

Another crucial characteristic of neutralizable oppositions is oppositional capacity.<sup>(1)</sup> That is to say, only those oppositions that can be opposed to the rest of the phonological units of a given system have archiphonemes. This 'oppositional capacity' is the basic principle for phonological existence in general. In German, the opposition between /t/ and /d/ is neutralized in word-final position and what occurs in this position is, from a phonological point of view, neither the "voiceless" nor the "voiced" stop but, rather, the "non-nasal dental occlusive" in general. Characterized as such, this archiphoneme can be opposed to the dental nasal /n/ as well as the non-nasal velar and the non-nasal labial stops, i.e. /k/, /g/ and /p/, /b/, respectively.

#### 4.10. Relatedness of the Members of a Neutralizable Opposition.

In the positions of relevance of a given phonological opposition, all the opposition members are clearly perceived, while in the position(s) of neutralization it is usually not possible to tell which of the members is produced or perceived. This arises from the fact that the specific features of an opposition member lose, in the position(s) of neutralization, their distinctive force. In other words, only those features

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contd. from previous page:- geschriebenen Sprachwissenschaftlichen Arbeiten" in Archiv für vergleichende Phonetik, 6, 1943, p.70.

(1) The term 'contrastive capacity' is used by Baltaxe in her translation of Trubetzkoy's Grundzüge (see Principles...; p.79) as an equivalent to Trubetzkoy's "Gegenüberstellung" (see also Krámský's The Phoneme... cit, p.96). But in view of what has

that are common to all the members of a given neutralizable opposition retain their distinctive force.

Trubetzkoy (Principles..., p.78) talks about the relation between the members of a neutralizable opposition in the position of relevance and says that they are "often felt only as two meaning-differentiating nuances [bedeutungsdifferenzierende Nuancen], that is, as two distinct yet closely related phonic entities". This means that there is a sense of 'intimate relatedness' between the members of a neutralizable opposition. To illustrate this, Trubetzkoy mentions French /i/ and /e/ as compared with /e/ and /ɛ/. He says that the phonic difference between the members of the two pairs of phonemes is more or less the same. But because the opposition between /e/ and /ɛ/ is neutralizable (while it is constant between /i/ and /e/), the French can easily feel there is a very close relation between /e/ and /ɛ/, while in the case of /i/ and /e/ they feel there is not any particular closeness. This is also maintained by Martinet (Phonology as Functional Phonetics... cit, p.6) who says that "linguistic feeling is a result of the functioning of the system".

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contd. from previous page:- been said about the concepts of 'opposition' and 'paradigmatic', I believe that the term 'oppositional capacity' should be used instead. Furthermore, Baltaxe erroneously translates Trubetzkoy's 'gegenübergestellt' as 'contrasted' while it should be 'opposed'.

#### 4.11. The Archiphoneme Representative

The concept of the 'archiphoneme representative' was coined and mainly utilized by Trubetzkoy<sup>(1)</sup> (see Principles... pp.79-83) who thinks that there are four possible cases as to how the archiphoneme is to be realized in the position(s) of neutralization of a neutralizable opposition.<sup>(2)</sup>

In CASE I, Trubetzkoy mentions the possibility that the archiphoneme representative may be realized as a sound which is not phonetically identical with either of the opposition members, i.e. a sound intermediary to them. For example, the second segment in the English word speak which is, in Trubetzkoy's view, phonetically intermediary to [p] and [b] (see Principles..., pp.79f).

(1) The majority of functionalists do not operate with the concept of the 'archiphoneme representative'. For example, see T. Akamatsu's views on it in his "De la notion de 'représentant de l'archiphonème'" in Actes du deuxième colloque de linguistique fonctionnelle, Clermont-Ferrand, 1975, pp. 95-101.

(2) From the four cases to be mentioned, it is not clear whether Trubetzkoy considers 'neutralizable oppositions' as phonological or as phonetic oppositions. Sometimes he seems to be talking about the opposition between phonic elements being neutralized in certain positions. In other instances, he seems to be talking about the opposition between phonemes being neutralized in certain positions. The inadequacy and ambiguity on Trubetzkoy's part are clearly manifested in his treatment of the archiphoneme representative. In other words, one would never know whether Trubetzkoy considers the archiphoneme representative as a phoneme or as a realization of a phoneme. He writes: "The representative of the archiphoneme of a neutralizable opposition occurring in the position of neutralization is not identical with either of the opposition members" (Principles..., p.79). This suggests, in my opinion, that the archiphoneme representative as well as the opposition members are phonetic realizations and not phonemes. This interpretation is based on the fact that phonemes are not, from the

CASE II considers the archiphoneme representative occurring in the position(s) of neutralization of a neutralizable opposition as being identical with one of the opposition members.

In other words, the archiphoneme may be realized as a sound which is phonetically identical with the realization of one of the opposition members in which case the choice of the archiphoneme representative is externally conditioned, i.e. "the opposition member that 'bears a closer resemblance or relation' to.... a neighbouring phoneme, or is even identical with it, becomes the representative of the archiphoneme" (Principles..., p.80). For example, the opposition between distinctively "voiceless" and "voiced" obstruents is neutralized before other obstruents "of the same type of articulation", in which case the "voiceless" member of the opposition becomes the archiphoneme representative before "voiceless" obstruents, and the "voiced" member before "voiced" obstruents.

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contd. from previous page:- functional standpoint, physical entities, i.e. they cannot be heard and so the adjective 'identical' can only apply to phonic elements (which are physical entities). That this argument is valid becomes clear when we look at Trubetzkoy's statement which says that the archiphoneme representative "is realized by a sound phonetically related to both opposition members but not identical with either one" (ibid). To my mind, this statement should be related to the notion of the 'archiphoneme' and not the 'archiphoneme representative' as Trubetzkoy puts it above. On the other hand, Trubetzkoy writes: "CASE II - The representative of the archiphoneme is identical with the realization of one of the opposition members..."(ibid, p.80). One would rightly take this to mean that the archiphoneme representative is a phonetic element which is, in this case, identical with the realization of one of the opposition members (i.e. the opposition members are, in this case, phonemes and not phonic elements since phonic elements are already phonetic realizations and so cannot be realized a second time). In addition, it is not very clear

In CASE III and CASE IV, Trubetzkoy talks about marked and unmarked members of phonological oppositions. CASE III states that it is the 'unmarked' member of the neutralized opposition that serves as the archiphoneme representative. In this case, the archiphoneme representative is conditioned internally. According to Trubetzkoy's theory, the specific features of the opposition member that serves as the archiphoneme representative become irrelevant, whereas the other member retains the phonological relevance of its specific features: the former member is considered as 'archiphoneme + zero' (i.e. unmarked), and the latter as 'archiphoneme + a specific mark' (i.e. marked). According to this case, it is the "voiceless" (i.e. unmarked) member of the opposition t/d in German that represents the archiphoneme in word-final position. As regards CASE IV, the sound realizing the archiphoneme in the position of neutralization of a neutralizable opposition may be identical with one member in one position and the other in another. For instance, the archiphoneme representative occurring in root-initial position of the neutralizable opposition s/ʃ in German is /ʃ/ whereas it is /s/ in root-medial and final positions. In this case, the choice of the archiphoneme representative in the position of neutralization is neither externally nor internally.

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contd. from previous pages:- whether Trubetzkoy's transcription of the words he cites in his Principles is phonetic or phonemic (any inaccuracy in my transcriptions of Trubetzkoy's examples is to be attributed to this ambiguity). It is due to this inadequacy of Trubetzkoy's theory of the archiphoneme representative that I, among other functionalists, reject the concept of the archiphoneme representative.



conditioned because the s/ʃ opposition is equipollent. Another example of this case is the neutralization of the opposition between what Trubetzkoy calls 'soft z' and 'sharp s' (see Principles..., p.82) root-initially and morpheme-finally in German: the archiphoneme being represented by /z/ initially and /s/ finally. This case gives rise to the problem as to which archiphoneme representative is to be regarded as "the more genuine" (ibid..., p.83). According to Trubetzkoy, the archiphoneme representative that occurs in the position of maximum phonemic differentiation is the more genuine one. Trubetzkoy adds that "since the opposition "sharp" s/"soft" z is logically privative, one can probably regard it as actually privative, and the "soft" z as its unmarked member" (ibid).

#### 4.12. Symbolizing the Archiphoneme.

As Fischer-Jørgensen rightly remarks, "there has been much difference of opinion as to the transcription of the member of an opposition occurring in the position of neutralization" (Trends..., pp.30f). In Trubetzkoy's notation, archiphonemes are symbolized by capital letters, e.g. the archiphoneme occurring in the position of neutralization (viz. word-finally) of the neutralizable opposition t/d in German is transcribed as /T/ (i.e. both Rat 'advice' and Rad 'wheel' are transcribed as /raT/). Fischer-Jørgensen (ibid. p.31) further states that Trubetzkoy "was inclined to consider archiphonemes as independent units in the phoneme inventory" in which case

the number of phonemes is increased and the transcription becomes somewhat clumsy". In his "Die Phonologischen Systeme" (TCLP, 4, esp. p.98), Trubetzkoy points out that in the position of neutralization, 'linguistic consciousness' ('Sprachbewusstsein', in German) always perceives the unmarked member regardless of the phonetic realization. This would mean that "a Russian would perceive z in the cluster zd- as unvoiced s" (ibid) and so it should, in Trubetzkoy's view, be symbolized as /s/. Martinet too, has, in his earlier works, used capital letters to symbolize archiphonemes.<sup>(1)</sup> Since this method of transcribing archiphonemes poses no typographical confusion, I shall adopt it in symbolizing the SIA archiphonemes (see sections 13.2 - 13.5 of this thesis).

On the other hand, T. Akamatsu (among other functionalists) would, for example, symbolize the archiphoneme occurring in word-final position of the opposition between the German phonemes /t/ and /d/ as /t-d/.<sup>(2)</sup> Furthermore, N. Davidsen-Nielsen would symbolize this archiphoneme as <t/d>.<sup>(3)</sup> As Fischer-Jørgensen states (see Trends..., p.31), several other Prague phonologists thought it better to transcribe archiphonemes the way they are pronounced.

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(1) See for example his La phonologie du mot en danois...cit, BSL, 38, esp. p.219.

(2) See for example his article, "The Neutralization of the /m/ -/n/ Opposition in English", in Bulletin of the Phonetic Society of Japan, 143, Tokyo, 1973, pp. 4-9.

(3) See for example his Neutralization and Archiphoneme...cit.

#### 4.13. "Neutralization" and "Defective Distribution".

Scholars outside the functional school of linguistics might confuse the notion of 'neutralization' with the notion of 'defective distribution'.<sup>(1)</sup> The distinction between the two notions is that 'neutralization' designates the non-validity of individual phonological oppositions in certain contexts, whereas 'defective distribution' designates the non-occurrence of individual phonemes in certain contexts. Martinet, among other functionalists, deals with this important matter (see for example his Phonology as Functional Phonetics...cit, p.7). In connexion with the non-occurrence of /t/ word-initially before /l/ in English, for example, he says that it is not to be considered as a case of neutralization because it is not possible to tell which of the two oppositions p/t and k/t is neutralized in the respective position (or context). He adds that it is not possible to consider [k] (as in clear) as the realization of an archiphoneme which is, in all other positions, represented by two separate phonemes. He bases his argument on his theory that "only phonemes that stand in exclusive relation can be considered as forming an archiphoneme". It follows from this that /k/ and /t/ are not in exclusive relation since the relevant features common to them (viz. "voiceless" and "non-nasal")

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(1) Attention should be drawn to the danger of confusing the concept of 'neutralization' with that of 'defective distribution'. The discrimination between the two phenomena is of paramount importance to functionalists. This distinction has been explained by scholars such as Martinet (see for example his Phonology as Functional Phonetics...cit, esp.p.7) and

are also shared by /p/ and therefore we cannot speak of an archiphoneme in the case of either of the pairs /k/ and /t/, and /p/ and /t/. This proves that the non-occurrence of /t/ word-initially before /l/ in English is a case of defective distribution and not neutralization. To make the distinction between the two concepts sharper, Martinet also gives an example of neutralization. In this connexion, he deals with the non-occurrence (or non-validity) of the p/b opposition in final position in Russian. He argues that the opposition between /p/ and /b/ is neutralizable since /p/ and /b/ are in exclusive relation (i.e. they are the only phonemes in the phonological system of Russian to share the relevant features "oral" and "bilabial") and that an "oral bilabial" archiphoneme (realized as [p]) occurs in final position of the p/b opposition in Russian.

#### 4.14. Functional Load

The concept of 'functional load'<sup>(1)</sup> is another important notion in functional phonology since it points to the importance

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contd. from previous page:- F. François (see for example pp.207f in Le langage, encyclopédie de la Pléiade... edited by A. Martinet). See also the remainder of this section.

(1) As R.S. Meyerstein states in his Functional Load (= Janua Linguarum, Series Minor, 99, Mouton, 1970, footnote 1 on p.13), the concept of 'functional load' (or simply 'load') is also referred to by the terms 'functional yield', 'yield', 'functional burden', 'burden', 'communication load' and 'weight'. In French it is referred to by the terms 'rendement fonctionnel' and 'rendement'; in German 'Belastung', 'semantische Belastung', 'funktionelle Belastung', 'Belastungs- und Kombinationsfähigkeit',

and degree of utilization of individual phonological oppositions in the phonological system of a given language (or dialect).

If we believe (and I have already stated that I do) that 'opposition' is the essence of phonological existence, it follows that the members of a given phonological opposition may or may not, as the case may be, undergo certain changes as to their phonological status (hence phonological evolution) depending, of course, on whether the functional load of the respective phonemes and the oppositions they enter into is low or high: <sup>(1)</sup>

In other words, what is in the present state of a given phonological system a distinctive unit (i.e. a phoneme) may become a non-distinctive unit (i.e. a variant of another existing phoneme) if the functional load of the respective phoneme and the phonological oppositions it forms with the other phonemes of the system is very low (or negligible), and vice-versa. For example, the English phoneme /h/ has been discarded in a good number of dialects, e.g. Cockney English, due to the very low functional load of /h/ and the oppositions it enters into in the phonological system of the respective dialects (i.e. Cockney

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contd. from previous page:- and 'Tragfähigkeit'; in Czech 'funkční zatížení'. For the sake of simplicity, I shall retain the most commonly used term 'functional load'.

(1) Functional load is by no means the only (nor necessarily the most decisive) factor in the phonological development (i.e. change) of language. On the various factors affecting the phonological development of language, see J. Vachek "On the Explanatory Power of the Functional Load of Phonemes" in Slavica Pragensia, 11 (Prague, 1969), pp.63-71; reprinted in J. Vachek's Selected Writings in English and General Linguistics (= Janua Linguarum, Series Maior, 92), Mouton, 1976, pp. 36-43.

English).<sup>(1)</sup>

A number of definitions of the notion of 'functional load' have been attempted.<sup>(2)</sup> The second of the nine theses that the LCP presented to the First Conference of Slavic Philologists (see TCLP, 1, pp. 7-29) concerns itself with the tasks of the study of linguistic systems. Part of the second thesis deals with the fundamental tasks of synchronic phonology, one of which reads:

"On doit... déterminer le degré d'utilisation et la densité de réalisation des phonèmes en question et des combinaisons de phonèmes d'étendue variée. Il faut également étudier la charge fonctionnelle des divers phonèmes et combinaisons de phonèmes dans une langue donnée."(p.11)

In view of the above quotation, 'functional load' (though the term is not used in the quotation as such) is conceived as the degree of utilization and the density of realization of the phonemes and phoneme combinations (or clusters) of a given

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(1) See LSP, pp. 68f, Lepschy's Survey..., pp.105f and Martinet's unpublished paper "The Internal Conditioning of Phonological Changes" read at the Eighth International Congress of Phonetic Sciences (Leeds, August 1975).

(2) For a critical account of the definitions to be presented in this section, see R.S. Meyerstein, op.cit, pp. 17ff.

language.

In the "Projet" of 1931, furthermore, 'functional load' was defined as the "degré d'utilisation d'une opposition phonologique pour la différenciation des diverses significations des mots dans une langue donnée" (TCLP, 4, p.313).

Trubetzkoy (Principles..., p.268) talks about the 'functional load' of a given phonological opposition and defines it as "the extent to which the individual phonological oppositions are utilized distinctively".<sup>(1)</sup>

In his Économie des changements phonétiques (Berne, 1955), Martinet defines the concept of 'functional load' as "l'importance fonctionnelle d'une opposition phonologique" (p.54).<sup>(2)</sup>

Finally, Fischer-Jørgensen, a non-functionalism,<sup>(3)</sup> conceives of 'functional load' as "the utilization of the existing phonological oppositions" (Trends..., p.39).

(1) Trubetzkoy also talks about what he calls the "average load" of the phonemes of a given language; see Principles... p.268. My own views on the concept of 'functional load' will be presented later in this section.

(2) In his unpublished paper of 1975 mentioned above, (see footnote (1) on page 112) Martinet defines the 'functional load' of a given opposition as "the frequency of its supporting the distinction between two words or segments of discourse".

(3) For more non-functional definitions and descriptions of the concept of 'functional load', see the following: (a) C.F. Hockett, A Manual of Phonology (= Indiana University Publications in Anthropology and Linguistics: IJAL, 21/4, Part 1), Baltimore, 1955, p.215, (b) J.H. Greenberg, "A Method for Measuring Functional Yield as Applied to Tone in African Languages" in Georgetown University Monograph Series on Languages and Linguistics, 12, pp. 7-16, Washington, D.C.: Georgetown University Press.

I agree with the above definitions insofar as they relate the concept of 'functional load' to the concept of 'phonological opposition'. But this does not, in my opinion, entitle us to restrict the concept of 'functional load' to individual phonological oppositions alone nor to individual phonemes alone. The concept of 'functional load' should, in my view, account for (a) the distinctive force of a given phoneme (or archiphoneme), i.e. the total number of different distinctive oppositions that a given phoneme (or archiphoneme) can form with the other phonemes (or archiphonemes) of the given phonemic system in the various word contexts, and (b) the degree of distinctive utilization of the distinctive oppositions determined under (a). In other words, I conceive of 'functional load' as the number of different distinctive oppositions that a given phoneme (or archiphoneme) can form with the other phonemes (or archiphonemes) of the given phonemic system, and the extent to which these distinctive oppositions are utilized in the various word contexts. In view of this conception, measuring functional load requires the following procedure:

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contd. from previous page: 1959, p.7, (c) R.P. Stockwell, J.D. Bowen and J.W. Martin, The Grammatical Structures of English and Spanish, Chicago, 1965, pp. 292f, (d) R.P. Stockwell, and J.D. Bowen, The Sounds of English and Spanish, Chicago, 1965, p.16, (e) C.F. Hockett, The Quantification of Functional Load: A Linguistic Problem, Santa Monica, California, 1966, p.8, (f) R.D. King, "Functional Load and Sound Change", in Language, 43, 1967, p.831, and (g) R.S. Meyerstein, op.cit, p.116.



(a) Specifying the various word contexts where a given phoneme (or archiphoneme) may occur in the system of the language under examination.

(b) Investigating the number of distinctive oppositions that the respective phoneme (or archiphoneme) may form with the other phonemes (or archiphonemes) of the given phonemic system in each of the word contexts specified in (a) above.

(c) Investigating the number of minimal pairs<sup>(1)</sup> implementing each of the different distinctive oppositions resulting from (b) above in each of the word contexts specified in (a) above, i.e. investigating the distinctive force of each of the phonological oppositions specified in (b) above.

The functional load of a given distinctive opposition can be worked out by adding up the number of minimal pairs that the given distinctive opposition yields in all the various word contexts specified in (a) above. To represent the functional load of a given distinctive opposition by a percentage (for practical purposes), we can apply the following formula:

$$\% = \frac{\text{total number of minimal pairs implementing a given distinctive opposition} \times 100}{\text{total number of minimal pairs implementing all the possible oppositions in the given phonemic system}}$$

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(1) The number of 'minimal pairs' which a given phoneme forms with the other phonemes of the respective phonemic system should not be confused with the number of 'words' that the given phoneme can enter into in the system of the language (or dialect) under consideration. The former (which is based on the notion of 'opposition') is related to the functional load of the given phoneme, whereas the latter (which eludes the notion of 'opposition') indicates the given phoneme's frequency of occurrence in words in the language (or dialect) under investigation.

The highest percentage represents the distinctive opposition which has the highest functional load in the system of distinctive oppositions of the respective phonological system, and so on.

The functional load of a given phoneme (or archiphoneme), on the other hand, can be worked out as follows:

- (1) Calculating the total number of minimal pairs that all the different distinctive oppositions which the respective phoneme (or archiphoneme) enters into in the given phonemic system yield in all the word contexts specified in (a) above.
- (2) Applying (a) above to each of the other phonemes (or archiphonemes) of the given phonemic system and adding up the results.
- (3) To represent the functional load of the given phoneme (or archiphoneme) by a percentage (for practical purposes), we can apply the following formula:

$$\% = \frac{\text{the outcome of (1) above} \times 100}{\text{the outcome of (2) above}}$$

The phoneme (or archiphoneme) with the highest percentage is considered as the phoneme (or archiphoneme) which has the highest functional load in the given phonemic system, and so on.

The above procedure is obviously rather complicated and almost impossible to follow to the very end in any sort of research that aims at clarity and adequacy. To make the measurement of 'functional load' practically possible and clear

enough, I propose that 'functional load' should be investigated under certain conditions to be specified by the researcher. In this research, for example, I shall attempt to investigate functional load in SIA under the following conditions:

(a) Restricting my investigation to only three word contexts, viz. word-initial, word-medial and word-final.

(b) Restricting my research to the functional load of the individual SIA phonemes as far as the number of different distinctive oppositions in the above three word contexts is concerned, i.e. my investigation will not account for the functional load of individual distinctive oppositions, as it is beyond the scope of the present research to work out all the possible minimal pairs that exist in SIA.

(c) To represent the functional load of a given SIA phoneme by a percentage, I shall apply the following formula:

$$\% = \frac{\text{total number of distinctive oppositions that the respective phoneme actually forms with the other phonemes of the SIA phonemic system} \times 100}{\text{total number of distinctive oppositions that each phoneme of the SIA system (or sub-system) can form with the other phonemes of the system}}$$

In the above formula, I say "...the SIA system (or sub-system)..." depending on whether my aim is to work out the functional load of a given SIA phoneme in comparison with the other phonemes of the same sub-system (i.e. the vowel system if the respective phoneme is a vowel and the consonant system if it is a consonant), or in comparison with the other phonemes of the whole phonemic

system (i.e. vowel as well as consonant phonemes). The phoneme with the highest percentage is considered as the phoneme with the highest functional load in the SIA system or sub-system, as the case may be, and so on.

## Chapter Five

PHONEMIC DIAGNOSIS: One or Two Phonemes?5.1. Introduction

As stated before, one of the major tasks of the phonologist is to establish a phoneme inventory for the language (or dialect) he is working on. In the process of achieving this task, the phonologist is often confronted with cases where it is not easy to decide whether he has to do with one or two phonemes. This makes it absolutely necessary for the phonologist to resort to well tried and tested rules and methods according to which phoneme inventories are to be established. In this chapter, therefore, I shall give a brief account of the different methods of phonemic diagnosis that have been formulated and followed by functionalists. Phonemic diagnosis of speech sounds is a means of testing whether a given single speech sound (or sound complex)<sup>(1)</sup> is to be regarded as a realization of one phoneme (i.e. interpreted monophonematically) or two phonemes (i.e. interpreted biphonemically or polyphonematically) in the language (or dialect) under investigation. The present chapter will also present, briefly, Trubetzkoy's set of rules for determining phonemes as well as a short account of other scholars' criticism of them.

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(1) By a 'single speech sound' is meant a 'simple speech sound' (e.g. [t], [ʃ], [d], [ʒ], [s], [z]) as compared with a 'sound complex' (e.g. [tʃ], [dʒ], [ts], [dz]).

## 5.2. The Commutation Test

In order to decide whether two speech sounds (or a speech complex) are a realization of one or two phonemes, the phonologist must first resort to the method that has proved very fruitful in phonological research, namely the 'commutation test'.<sup>(1)</sup> Although this method of phonemic diagnosis has been used by Prague phonologists, "it was never referred to by the above term" (LSP, p.53). Vachek points out that "this test is usually associated in linguistic theory with the Copenhagen group, which give it much attention..." (ibid). However, the essence of the commutation test had already been known before the Prague School was founded.<sup>(2)</sup> The reason why the commutation test is usually associated with the Copenhagen group (i.e. the Linguistic School of Glossematics) is that glossematics made the test its main tool in the analysis of language, i.e. glossematics applies the test to all linguistic domains (viz. phonology, syntax, etc.) right from the start. Besides its linguistic validity (i.e. justification), the commutation test is also useful because it saves the phonologist a great deal of time and troublesome work. F. François (see his "La description linguistique"...cit) states

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(1) This method of phonemic diagnosis (or analysis) has also been referred to by the name 'substitution test'; see section 5.6 of this thesis.

(2) In his LSP (footnote 24 on p.53), Vachek writes: "As a matter of fact, the commutation test was already known to J. Winteler as early as 1876!". See J. Winteler's well-known work: Die Kerenzer Mundart des Kantons Glarus, Leipzig, 1876.

that "la commutation sert à établir un inventaire en une position donnée; elle ne permet pas de dire que dans les positions différentes il s'agit du même phonème" (p.191). This means that the commutation test yields a phoneme inventory by means of opposing speech sounds to each other in certain word positions (i.e. word-initially, word-medially, word-finally, etc.). The importance of the test is also expressed by Martinet in his Elements, where the test is said to enable us "to establish the phonemes, and the archiphonemes, of a language and at the same time to classify each of them according to the relationships which it has with the other phonemes and archiphonemes of the system" (p.73). He goes on to say: "Everything is based on the operation called commutation, the one which permitted us to oppose the first segment of lampe to that of rampe and to analyse into two successive elements the initial part of cruche by opposing it to ruche" (ibid). In other words, the commutation test is based on 'opposition' which is, to most functionalists including myself, the most important concept in phonology; other concepts like 'phoneme', 'variant', etc. being mere corollaries of it.

The importance attached to the commutation test by the Praguians is clearly felt in Trubetzkoy's contributions towards the formulation of rules and guide-lines as to whether the phonologist has to do with one or two phonemes. These rules are, as we shall see in sections 5.3.- 5.5. of this thesis,

based on the commutation test. Trubetzkoy's first contribution to this matter is found in the detailed commentary he adds to the definition of the phoneme contained in the LCP's "Projet" of 1931. A detailed version of Trubetzkoy's rules (contained in the "Projet", pp.311f) is found in his booklet entitled Anleitung zu phonologischen Beschreibungen (Brno 1935).<sup>(1)</sup> Ultimately, a revised version of these rules was incorporated in Trubetzkoy's Principles (pp.46-65), where he gives "instructions as to how languages are to be described in phonological terms" (LSP, p.53).

### 5.3. Trubetzkoy's Rules for Determining Phonemes.

In this section, I shall give an account of Trubetzkoy's wording of his rules for determining phonemes, coupled with what other scholars have written about them. In his Principles (pp.46-51), Trubetzkoy introduces four rules as to whether two single speech sounds should be assigned to one or two phonemes in the phonological system of a given language.

RULE I reads as follows (for detail see Principles..., pp. 46-48):

" Two sounds of a given language are merely optional phonetic variants of a single phoneme if they occur in exactly the same

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(1) This booklet was translated by L.A. Murray under the title: Introduction to the Principles of Phonological Descriptions (edited by H. Bluhme), The Hague, 1968.



environment and are interchangeable without a change in the lexical meaning ['intellektuelle Bedeutung', A.R.] of the word." (p.46)

RULE II reads as follows (for detail see ibid, pp.48f):

"If two sounds occur in exactly the same position and cannot be interchanged without a change in the meaning of the words or without rendering the word unrecognizable, the two sounds are phonetic realizations of two different phonemes." (p.48)

RULE III, on the other hand, reads as follows (for detail see ibid, pp. 49f):

"If two sounds of a given language, related acoustically or articulatorily, never occur in the same environment, they are to be considered combinatory variants of the same phoneme." (p.49)

Finally, RULE IV reads as follows (for details see ibid, pp.50f):

"Two sounds that otherwise meet the conditions of Rule III can still not be regarded as variants of the same phoneme if, in a given language, they

can occur next to each other, that is, if they are part of a sound sequence in those positions where one of the sounds also occurs in isolation."(p.50)

Krámský (The Phoneme...cit, pp.64-67) gives a brief account of Trnka's 1954 critical article<sup>(1)</sup> which discusses Trubetzkoy's rules above. In this article, Trnka points out that the first three rules are based on the criterion of substitution (i.e. commutation) while the fourth rule is merely a limitation of the third. He considers RULE I as inaccurate since it fails to explain the phonological status of the glottal stop in Czech which should, according to this rule, be regarded as a phoneme because it cannot be interchanged with [p] without a change of the meaning of the respective words (e.g. [s<sub>2</sub>údy] 'with limbs' vs. [spúdy] 'from the loft') - apparently this is not the case in Trnka's view. RULE II, on the other hand, is criticized for containing a negative character ('unkennlich'). RULE III is based on phonetic similarity and so it is inconsistent since "the fact of articulatory relationship is hardly in agreement with Trubetzkoy's tenet of the priority of the phoneme and the dependence on it of its phonetic realization" (The Phoneme...cit, p.65). Trnka attributes the complexity of Trubetzkoy's rules

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(1) See B. Trnka "Určování fonému" (On Determining the Phoneme), in Acta Universitatis Carolinae, 1954, 7, Philologica et historica, pp.16-22.

to the lack of the concept of contrast. That is to say, for two speech sounds (even if they follow each other) to be regarded as realizations of two different phonemes, they have to be in contrast with each other. This concept of contrastiveness (also 'contrastivity' or 'contrastability')<sup>(1)</sup> is, according to Trnka, the principal criterion of phonological evaluation of sound complexes. Owing to the above weaknesses of Trubetzkoy's rules, Trnka introduces the following reformulation which is based on his (i.e. Trnka's) conception of the phoneme:<sup>(2)</sup>

- " 1. the phonetic complex the components of which are not contrasted to each other and which contains a certain sum of relevant features, is a single phoneme;
2. the sound whose omission (or insertion) in a word does not result in a change of its intellectual meaning, is not a phoneme;
3. the sounds which have the same sum of relevant features realize one (and only one) phoneme;
4. two sounds whose substitution for each other results in a change of stylistic character, are stylistic variants of one phoneme."

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(1) For the conception of these terms, see B. Trnka, A Phonological Analysis of Present-Day Standard English (revised new edition), Tokyo, 1966, pp.6f; see also section 5.6. of this thesis.

(2) In his article, ibid, Trnka conceives of the phoneme as "a

#### 5.4. Rules for Monophonematic Evaluation.

In addition to his treatment of 'single' speech sounds, Trubetzkoy also tackles the problem of whether to assign 'sound complexes' (e.g. affricates and diphthongs) to one or two phonemes. Trubetzkoy (Principles..., pp.55f) briefly mentions the phonetic and phonological conditions governing the monophonematic evaluation of sound complexes (or combinations of sound).

We read:

"In general one can say that in a given language only those combinations of sound can be interpreted as monophonematic whose constituent parts are not distributed over two syllables, and which are, further, produced by a homogeneous articulatory movement. Their duration must not exceed the normal duration of single sounds. A combination of sounds that fulfills these purely phonetic prerequisites is only "potentially monophonematic." However, it will also be interpreted as being actually monophonematic, if in accordance with the rules of the particular language it is treated as a single phoneme, or if the general structure of the phonemic system of

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contd. from previous page: sum of relevant features distinguished from other such sums in the word by contrastivity" (Krámský's English wording contained in The Phoneme...p.67). The English wording of Trnka's reformulation of Trubetzkoy's rules (to be quoted) is Krámský's (see ibid).

that language calls for such an evaluation. A monophonematic evaluation of a combination of sounds is particularly favoured when its constituent parts cannot be taken as the realization of any other phonemes of the same language."

Trubetzkoy (ibid, pp.56-60) puts the above phonetic and phonological criteria for a monophonematic interpretation of sound complexes in the form of the following six rules. According to RULE I, "only those combinations of sound whose constituent parts in a given language are not distributed over two syllables are to be regarded as the realization of single phonemes", as in the case of Czech [ts]. RULE II states that "a combination of sounds can be interpreted as the realization of a single phoneme only if it is produced by a homogeneous articulatory movement or by the progressive dissolution of an articulatory complex", as in the case of English [eɪ] and [əʊ]. According to RULE III, on the other hand, "a combination of sounds can be considered the realization of a single phoneme only if its duration does not exceed the duration of realization of the other phonemes that occur in a given language", as in the case of Russian [ts] and [tʃ]. This rule, as Trubetzkoy himself admits, is less practical than the previous two. RULE IV reads as follows: "A Potentially monophonematic combination of sounds, that is, a combination of sounds corresponding to the conditions of Rules I to III, must be

evaluated as the realization of a single phoneme, if it is treated as a single phoneme; that is, if it occurs in those positions in which phoneme clusters are not permitted in the corresponding language". This rule applies to [ts], [dz], [tʃ] and [dʒ] (in Tlingit, Japanese, the Mongolian, Turko-Tatar languages) and many other initial consonant clusters in many other languages. RULE V states that "a combination of sounds fulfilling the conditions of Rules I to III must be considered the realization of a single phoneme, if this produces symmetry in the phonemic inventory", as in the case of the sequences [ts] and [tʃ] in Chechen, Georgian and Tsinshin. Finally, RULE VI reads as follows: "If a constituent part of a potentially monophonemic sound combination cannot be interpreted as a combinatory variant of any other phoneme of the same language, the entire sound combination must be considered the realization of a single phoneme". This, according to Trubetzkoy, applies to Serbo-Croatian and Bulgarian sequence of [r] plus (preceding or following) vocalic glide like [ə], i.e. [ər] and [rə].

The above rules for a monophonemic interpretation of sound combinations have been criticized by A. Martinet (see his "Un ou deux phonèmes?" op.cit) for being purely phonetic. Furthermore, Martinet maintains that only RULE VI is relevant (see Fischer-Jørgensen's Trends..., p.27). He further reformulates this rule to the effect that "the elements in the combination manifest two phonemes if they can each be commuted with other sounds, or with zero, but one phoneme if only one or neither of

them is commutable".<sup>(1)</sup>

### 5.5. Rules for Polyphonematic Evaluation.

In addition to the above rules for a monophonematic interpretation of sound complexes, Trubetzkoy also considers the possibility of a polyphonematic interpretation of single speech sounds and sound complexes (see Principles..., pp.60ff) and points out that "the polyphonematic evaluation of a single sound is exactly the opposite of a monophonematic evaluation of a sound combination" (p.60). Trubetzkoy presents the phonetic prerequisites for a polyphonematic evaluation of single sounds. We read (ibid):

"In almost all...cases a phoneme sequence consisting of a vowel plus a preceding or following consonant is realized either as the consonant alone or as the vowel alone. The former case can occur only when the "suppressed", that is, the unrealized vowel has a particularly slight degree of sonority in other positions and accordingly approximates a consonant from an acoustic and articulatory point of view. The second case, on the other hand, is possible

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(1) This is Fischer-Jørgensen's English wording of Martinet's reformulation of Trubetzkoy's RULE VI above; see Trends...cit, p.27. Martinet's reformulation can, in my view, be applied to SIA [tʃ] and [dʒ]; see section 8.14 of this thesis.

only if the suppressed consonant in other positions is realized as particularly "open", that is, with as much sonority and as little friction as possible, and consequently approximates a vowel. The first case actually involves short or unstressed high or indeterminate vowels, the second sonorants (liquids, nasals and w and j)."

Trubetzkoy summarizes the phonological conditions governing the polyphonematic evaluation of speech sounds under the following rule: "If a single sound and a combination of sounds corresponding to the above phonetic prerequisites stand in a relation of optional or combinatory variance, in which the sound combination must be considered the realization of a phoneme sequence, the single sound must also be considered the realization of the same phoneme sequence"(ibid). This phonological rule applies, in Trubetzkoy's view, to the following three typical cases:

(a) When the given single sound only occurs in positions where the respective sound combination is not permitted in the language (or dialect) under investigation. This is the case with the German syllabics [l̥], [m̥] and [n̥] which only occur in unstressed syllables before consonants and in final position, whereas the corresponding sound combinations (viz. [el], [em] and [en], respectively) only occur in unstressed syllables before vowels. In other words, [l̥], [m̥] and [n̥] should be



regarded as realizations of the phoneme combinations /e+l/, /e+m/ and /e+n/, respectively.

(b) When the given single speech sound only occurs in a specific sound combination in which it is regarded as a combinatory variant of a particular phoneme, and also in another position where the respective sound combination is not permitted: in this position the single sound must be regarded as a substitute for the respective sound combination and must, therefore, be regarded as the realization of the corresponding phoneme combination. In Czech, for example, [i] is a phonetically 'tense' vowel when occurring after [j] and after the palatals [tʰ], [dʰ] and [ɲ], whereas it is a 'lax' vowel when occurring after gutturals, dentals, and sibilants.<sup>(1)</sup> In connected speech, however, [j] in the sound sequence [ji] is elided after a final consonant of the preceding word, in which case [i] occurs directly after gutturals, dentals, and sibilants where it is regarded as the realization of the phoneme sequence /j+i/.

(c) When 'high' vowels may optionally be elided in languages where consonant clusters are phonemically not permitted or are only permitted in a particular position. In this case, the consonant sound preceding another consonant sound should be regarded as the realization of the phoneme sequence

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(1) In order not to misquote Trubetzkoy's example of [i] and [ji], I have retained his phonetic labels 'tense' and 'lax' as well as his symbols [i, j, tʰ, dʰ, ɲ]; see his Principles..., pp.61-62. The same applies to the example to be quoted under (c).

of "consonant + high vowel". For example, in Uzbek, where consonant sequences (i.e. clusters) are not permitted word-initially and the high vowels (e.g. [i]) are elided in unstressed initial syllables, word-initial consonant sounds (e.g. [p] as in [pširmoq]) are to be considered as realizations of the phoneme sequence of "consonant + high vowel", i.e. the word [pširmoq] should phonemically be transcribed as /piširmoq/.

In his monophonematic and polyphonematic evaluation of single sounds as well as sound sequences (or combinations), Trubetzkoy draws attention to the danger of erroneously interpreting the foreign sounds that are adopted in the particular native language. We read:<sup>(1)</sup>

"The rules governing monophonematic and polyphonematic evaluation refer to the structure of a given system and to the special role of the particular sound in this system. Sounds or combinations of sounds that are evaluated as monophonematic or polyphonematic in one language need not be considered such in other languages. But in the perception of a foreign language the "naive" observer

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(1) For details, see Trubetzkoy's Principles...cit, pp.51-55 and 62-64.

transfers to the foreign language the phonic values that are the result of the relations existing in his own mother tongue. This, of course, leaves him with a quite incorrect impression of that language."

(p.62)

#### 5.6. Other Methods of Phonemic Diagnosis.

It is not always possible to directly apply the commutation test in order to decide whether two speech sounds should be considered as realizations of one or two phonemes. For example, the phonologist may encounter cases where the sounds concerned are not commutable, i.e. they never occur in commutable positions. An often-quoted example is the English speech sounds [h] and [ŋ]. In this particular case, the commutation test fails to provide any definite answer as to whether [h] and [ŋ] should be assigned to one or two English phonemes, since they never occur in positions where they are commutable. More specifically, [h] occurs word-initially in English whereas [ŋ] never does, and conversely [ŋ] occurs word-finally where [h] does not, e.g. in English there exists the word [hit] but never \*[ŋit] (similarly [siŋ] but never \*[sih]). Therefore, the application of the commutation test would give no definite answer as to whether English [h] and [ŋ] should be assigned to one or two phonemes. However, these two sounds have always been considered as realizations of two separate phonemes in the phonological system of English.

It should be pointed out that a phonological analysis of a given language (or dialect) is never complete unless it accounts for all the problems that may arise. So what is the phonological explanation (or justification) for considering [h] and [ŋ] as realizations of two different phonemes in English? A possible phonological explanation is presented by Trnka in the revised new edition of his monograph: A Phonological Analysis of Present-Day Standard English (Tokyo 1966). In this monograph, Trnka presents two criteria for phonemic diagnosis of speech sounds: the substitution test and the test of relevant features. He writes:

"The substitution test allows us to establish the inventory of phonemes found in the same position in words, but it does not permit us to infer whether a sound occurring in a certain position is, or is not, the same phoneme as a similar one found in another phonetic environment [as in the case of [p<sup>h</sup>] and [p] in English, A.R.]... What we need is a reliable test for the identity of phonemes, and this must be sought in the analysis of sounds into their relevant (or, distinctive) features, i.e. those which are independent of their phonetic environments and therefore able to differentiate one phoneme from another. Two sounds consisting of the same bundle of relevant

features must be assigned to a single phoneme [hence [p<sup>h</sup>] and [p] are to be regarded as realizations of one and the same English phoneme, viz. /p/, A.R]... If the substitution test cannot be applied for the phonemic diagnosis of sounds, the test of relevant features must be used."(p.4).

Accordingly, English [h] and [ŋ] are assigned to two separate phonemes on the basis that "they consist of two different bundles of relevant features" (ibid), viz. "glottal" vs. "velar" and "nasal", respectively.

Another problem that the phonologist may meet with in the process of phonemic diagnosis (or analysis) is whether to assign sound complexes (e.g. affricates and diphthongs) to one or two phonemes. This problem, too, was tackled by Trnka in his 1966 monograph mentioned above. In this connexion, Trnka applies what he calls the test of contiguous contrastiveness by means of which "articulatory complexes can be segmented into single phonemic units contrasting to each other" (p.6). According to this test, sound complexes like English [ts](as in [ka:ts] and [dz] (as in [ri:dz]) are to be interpreted as realizations of combinations of two phonemes each, i.e. /t+s/ and /d+z/, respectively, since there is a contrast between the segments of the respective sound complexes (also 'sound sequences' or 'sound combinations'), i.e. there is a contrast between [t] and [s]

and between [d] and [z]. On the other hand, if there is no contiguous contrastiveness between the segments (or constituents) of a given sound complex, the respective sound complex is to be interpreted monophonematically, i.e. as a realization of a single phoneme. This is the case with English [tʃ] (as in [ka.tʃ]) and [dʒ] (as in [brɪ.dʒ]). In other words, the English affricates [tʃ] and [dʒ] (the duration of which does not exceed that of [ʃ] and [ʒ], respectively, and which are, like [ʃ] and [ʒ], indivisible into two syllables or monemes) are to be interpreted as realizations of single phonemes, i.e. /tʃ/ and /dʒ/, respectively. To recapitulate, the test of contiguous contrastiveness yields a polyphonematic interpretation for the English affricates [ts] and [dz], but a monophonematic interpretation for the English affricates [tʃ] and [dʒ].<sup>(1)</sup>

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(1) A. Martinet and F. François, among other functionalists, also tackle the problem of the phonological status of affricates. See (a) A. Martinet, "Un ou deux phonèmes?"...cit, (b) A. Martinet, La description phonologique...cit,p.43 and (c) F. François, op. cit. pp.192f. For my interpretation of the phonological status of the SIA affricates, see section 8.14 of this thesis.

## Chapter Six

TYPES OF OPPOSITIONS6.1. Introduction

This chapter deals with the classification of oppositions based on the analyses presented by R. Jakobson, N.S. Trubetzkoy and B. Trnka. Classifying oppositions lends itself to the following three criteria:

- (a) the theory of 'distinctiveness',
- (b) a 'logical' analysis, and
- (c) a 'phonological' analysis.

Special emphasis will be laid on Trubetzkoy's exhaustive classification of oppositions, which is, in my opinion, the best in theory and detail (see Principles..., pp.31-33 and pp.66-227).

6.2. Classification of Oppositions According to the Theory of 'Distinctiveness'.

As Trubetzkoy rightly states, "the concept of distinctiveness presupposes the concept of opposition" (Principles...,p.31). In other words, it is not possible to distinguish between two utterances unless they are opposed to each other. According to the theory of distinctiveness ('Die Unterscheidungslehre' in German), Trubetzkoy distinguishes two types of oppositions. We read:

" Oppositions of sound capable of differentiating

the lexical meaning of two words in a particular language are phonological or phonologically distinctive or distinctive oppositions. In contrast, those oppositions of sound that do not have this property are phonologically irrelevant or non-distinctive."

(ibid)(1)

In SIA for example, the opposition between [m] (as in [ta:m]) and [dʒ] (as in [ta:dʒ]) is distinctive since the substitution of [m] by [dʒ] in the context [ta:-] changes the meaning from 'perfect or complete' to 'crown', respectively. On the other hand, the

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(1) In a paper entitled "Der Gegenstand der Phonologie" (in Zeitschrift für Phonetik und allgemeine Sprachwissenschaft, 10/3, 1957, pp.193-203), S.K. Saumjan criticizes Trubetzkoy for using the expression 'distinctive opposition' synonymously with the expression 'phonological opposition'. Saumjan allegedly states that the equalization of the two expressions leads to the erroneous idea of a direct connexion between the sounds of a language and the meaning of words. He thinks that meaning is not inherent in individual speech sounds but in the entire sound complex of the word, i.e. in the signifiant. Therefore, Saumjan conceives of a phonological opposition as a sound opposition capable of differentiating between the signifiant of two words of a given language, and of a non-phonological opposition as a sound opposition which does not possess the above-mentioned capability. In my opinion, Saumjan's criticism is not valid since Trubetzkoy (Principles..., p.44) specifies when to use each of the two expressions (or terms). We read:

"In "Projet...", the term "phonologischer Gegensatz", "opposition phonologique", is proposed. This term may be retained for all those languages in which the word "phonological" cannot cause misunderstandings. For English, however, we would recommend the term "distinctive opposition" since both "phonological opposition" and "phonemic opposition" might give rise to misunderstandings."



substitution of a flapped r- sound by a rolled r- sound is phonologically non-distinctive in the SIA phonological system (i.e. the opposition between [r] and [r̥] is non-distinctive in SIA). In defining the sounds that can and those that cannot form distinctive oppositions, Trubetzkoy distinguishes between interchangeable and non-interchangeable sounds. He conceives of 'interchangeable sounds' as sounds that "can occur in the same phonic environment in a given language" (Principles..., p.32). On the other hand, he conceives of 'non-interchangeable sounds' as sounds that "can never occur in the same phonic environment in the particular language" (ibid). Subsequently, Trubetzkoy draws the conclusion that "non-interchangeable sounds in principle cannot form phonological (distinctive) oppositions" (ibid), whereas "interchangeable sounds can form distinctive as well as non-distinctive oppositions" (ibid) depending entirely on "the function such sounds fulfil in a given language" (ibid). As an example of interchangeable sounds, Trubetzkoy mentions [o] and [i] in German as in so 'thus, so' vs. sie 'she, they'. On the other hand, he mentions German [x] and [ç] (orthographically represented by ch) as an example of non-interchangeable sounds. In this connexion, he says that the opposition between [x] and [ç] is non-distinctive in the words ach (i.e. [-x]) and ich (i.e. [-ç]) since [x] and [ç] are non-interchangeable. However, ch (i.e. [x] or [ç]) is a member of a distinctive opposition in the case of minimal pairs like stechen 'stab' (i.e. [-ç-]) vs. stecken 'stick' (i.e. [-x-]) and roch 'smelled' (i.e. [-x]) vs. Rock

'skirt' (i.e. [-k]). In these minimal pairs, ch (i.e. [x] or [ç], as the case may be) is interchangeable with the k-sounds and so [x] (or [ç]) is a member of a distinctive opposition.

### 6.3. Logical Classification of Distinctive Oppositions:

Distinctive (phonological) oppositions have been classified logically in various works by functionalists. In this section, I shall give a brief account of what I consider the most important classifications (in chronological order).

The first attempt to study the mutual relations of the phonemes of a given language was made in 1928 in the joint theses of Jakobson, Karcevskij and Trubetzkoy presented to the First International Congress of Linguists held at the Hague. The theses appeared in reply to the question: "Quelles sont les methodes les mieux appropriées à un exposé complet et pratique de la phonologie d'une langue quelconque?"<sup>(1)</sup> In these theses we read:

" Il est surtout utile d'envisager comme une classe à part de différences significatives les corrélations phonologiques. Une corrélation phonologique est constituée par une série d'oppositions binaires définies par un : principe commun qui peut être pensé

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(1) See "Proposition au premier congrès international de linguistes", in Actes du Premier Congrès International de Linguistes (La Haye, 10-15 April, 1928), Leiden 1930, pp.33-36 (reprinted in SW, 1, pp. 3-6). The quotation to be given is found on p.3 in SW,1.

indépendamment de chaque couple de termes opposés." [emphasis added]

In the Remarques of 1929, Jakobson distinguishes two types of phonological oppositions: the oppositions of correlative phonemes and the oppositions of disjunct phonemes. We read:

"Le premier type d'oppositions est caractérisé par ceci: la conscience de la corrélation des phonèmes en opposition est conditionnée par l'existence, dans un système phonologique donné, de toute une série d'oppositions binaires d'un même type (nous appellerons conventionnellement celles-ci couples de corrélation); le "principium divisionis" est abstrait par la conscience linguistique, est mis en facteur commun, et peut être pensé indépendamment des couples particuliers en opposition. D'un autre côté, naturellement, on peut abstraire aussi l'élément commun qui unit les deux membres d'une opposition, et ce substrat constitue, dans le système phonologique, une sorte d'unité réelle. L'alternance grammaticale des deux membres d'une opposition (c'est-à-dire l'utilisation morphologique de cette opposition) peut être un important facteur concomitant qui aide à dégager, d'une part

le substrat, d'autre part le principium  
divisionis. [TCLP, 2, p.6 or SW, 1, p.9]

In this work, Jakobson gives examples of what had already been called the "principe commun" (= common principle) in the "Proposition..." of 1928. These examples include the following: the presence or absence of vocalic stress, the presence or absence of voice (i.e. the "voiced" or "voiceless" feature of consonants) and the "soft" or "hard" feature of consonants.

In the "Projet" of 1931, two types of oppositions are distinguished: a 'corrélacion phonologique' (= phonological correlation) and a 'disjonction' (= disjunction). A phonological correlation is defined as a "système d'oppositions phonologiques caractérisées par une propriété de corrélation commune" (TCLP, 4, p.313). Prior to this definition, the "Projet" defines the concept of 'propriété de corrélation' (= quality of correlation) as an "opposition de la présence et de l'absence d'un certain caractère phonique qui différencie plusieurs couples d'unités phonologiques et qui, dans le système phonologique donné, peut être conçue abstraction faite de couples particuliers en opposition" (*ibid*).<sup>(1)</sup> Disjunction, on the other hand, designates all such relations of phonemes as do not belong to correlation:

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(1) In view of this definition, a marque de corrélation (= mark of correlation) is defined as a "caractère phonique qui, opposé à l'absence de ce caractère, forme une propriété de corrélation" ("Projet", p.313); see also section 4.5 of this thesis.

"Opposition de deux unités phonologiques disjointes" (p.314).<sup>(1)</sup>  
 Prior to this definition of 'disjunction', the "Projet" defines the concept of 'unités phonologiques disjointes' (= disjunct phonological units) as "unités phonologiques appartenant à un système, sans former entre eux un couple de corrélation" (ibid), e.g. Latin /a/ and /u/, and /a/ and /n/, etc. In view of the above definition of 'phonological correlations', the English oppositions p/b, t/d, k/g, etc. (based on "voiceless" vs. "voiced") are correlative (each of the pairs /p/ and /b/, /t/ and /d/, /k/ and /g/, etc. is called a 'couple de corrélation', i.e. a 'correlation pair',<sup>(2)</sup> and the members of each correlation pair are called 'correlative phonemes').

J. Vachek (LSP, pp.55f) rightly supports Trubetzkoy's observation that phoneme correlations may, in certain cases, be interlinked. For example, in the Modern English correlations

/p/ - /b/	/t/ - /d/
/f/ - /v/	/θ/ - /ð/

the phonemes which are horizontally placed are linked by the correlation of voice, while those which are vertically placed are linked by the correlation of occlusiveness. Such instances

(1) Compare this definition with Trnka's definition of 'disjunct oppositions' below.

(2) The "Projet" defines a correlation pair as "chacune des oppositions phonologiques dont l'ensemble forme une corrélation" (TCLP, 4, p.314); see also section 4.5 of this thesis.

of correlation are referred to by Trubetzkoy as 'correlation bundles' (Korrelationsbündel).<sup>(1)</sup>

Realizing the inadequacy of the old dichotomy of 'correlations' and 'disjunctions', Trubetzkoy, in a 1936 article,<sup>(2)</sup> makes the first attempt to replace it by an adequate, though more complex, classification. The definite version of the set of phonological oppositions proposed in this article is found in Trubetzkoy's Grundzüge of 1939. In his Grundzüge (i.e. Principles..., pp.67-83), Trubetzkoy establishes an elaborate and detailed system of oppositions based largely on his classification of phonological oppositions formulated in his 1936 article mentioned above.<sup>(3)</sup> In Trubetzkoy's Principles, phonological oppositions are classified according to the following three criteria: (a) their relation to the rest of the system of phonological oppositions, (b) the

(1) Trubetzkoy's conception of a 'correlation bundle' is expressed in his Principles (p.86), where he writes:

"In cases where a phoneme participates in several correlations of the same related class, all phonemes taking part in the same correlative pairs unite to form a multi-member correlation bundle."

Trubetzkoy also discusses this matter in his "Zur allgemeinen Theorie phonologischer Vokalsysteme", in TCLP, 1, 1929, pp.39-67 (reprinted in PSRL, pp.108-142).

(2) See Trubetzkoy, "Essai d'une théorie des oppositions phonologiques", in J.Psych., 33, 1936, pp.5-18.

(3) Martinet, too, gives an account (though brief) of the features that may (or may not, as the case may be) function distinctively in various languages; see for example his La description phonologique...cit, pp.16-33.

relation between the members of the given phonological oppositions, and (c) the distinctive validity of the respective phonological oppositions.

On the basis of their relationship to the entire system of oppositions, phonological oppositions are classified into bi-lateral and multilateral oppositions.<sup>(1)</sup> In the former type, "the sum of the properties common to both opposition members<sup>(2)</sup> is common to these two opposition members alone", (Principles..., p.68) and is never found in any other phoneme in the phonological system. In the case of multilateral oppositions, on the other hand, the sum of the properties common to both opposition members is also found in one or more of the other members of the given phonological system.<sup>(3)</sup> Accordingly, Trubetzkoy writes:

" ... the opposition t-d is bilateral in German because t and d are the only dental occlusives of the German phonemic system. The opposition

(1) In a footnote in his "Essai d'une théorie...", Trubetzkoy uses the expressions 'opposition à une seule dimension' and 'opposition à plusieurs dimensions', respectively, which he attributes to K. Bühler. However, the French expressions "opposition bilatérale" and "opposition multilatérale", and the German expressions 'eindimensionale' and 'mehrdimensionale' opposition are found in most of Trubetzkoy's works including "Essai d'une théorie..."; in the actual text.

(2) This is, in Trubetzkoy's terminology, called the 'basis for comparison'; see Principles..., p.68.

(3) Trubetzkoy notes that there are more multilateral oppositions than there are bilateral oppositions in any system of oppositions. He goes on to sub-classify 'multilateral oppositions' into homogeneous and heterogeneous oppositions. In addition, he distinguishes two types of 'homogeneous multilateral oppositions': linear

d-b, on the other hand, is multilateral in German because the weak occlusion that the two phonemes have in common also recurs in another German phoneme, namely g." [ibid]

Trubetzkoy also distinguishes between proportional and isolated oppositions. On page 70, we read:

"An opposition is proportional if the relation between its members is identical with the relation between the members of another opposition or several other oppositions of the same system. For example, the opposition p-b in German is proportional because the relation between p and b is identical with that between t and d or between k and g. The opposition p-š, on the other hand, is isolated because the German phonemic system does not have any other pair of phonemes whose members would be related to each other in the same way as p is related to š.  
The distinction between proportional and isolated oppositions can exist in the case of bilateral as well as multilateral oppositions:

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contd. from previous page; and nonlinear. See the definitions and illustrations of these sub-types of oppositions in Principles..., pp.69f.



in German, for example, the opposition p-b is bilateral and proportional, r-l bilateral and isolated, p-t multilateral and proportional (see b-d and m-n), and p-š multilateral and isolated."<sup>(1)</sup> [emphasis added]

The significance of distinguishing between these types of oppositions lies in the fact that, as Trubetzkoy mentions on page 74, "the structure of a phonemic system depends on the distribution of the bilateral, multilateral, proportional, and isolated oppositions".

On the basis of the relationship between the members of given oppositions, Trubetzkoy distinguishes the following three types of phonological oppositions: privative, gradual and equipollent.<sup>(2)</sup> Privative oppositions are defined as "oppositions in which one member is characterized by the presence, the other by the absence, of a mark" (p.75).<sup>(3)</sup> Trubetzkoy goes on to say

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(1) Trubetzkoy notes that isolated oppositions outnumber proportional oppositions in any phonological system. As an example, he cites the German consonant system; for details see pp.70-74. Trubetzkoy also emphasizes the phonological fact that "the phonemic content of a phoneme depends on the position of this phoneme in the phonemic system and consequently on the structure of that system" (p.72). For Trubetzkoy's illustration of this fact, see pp.73f.

(2) On these types of oppositions, see also T. Akamatsu, "Opposition privative, graduelle, equipollente, et opposition phonologique," in Estudios ofrecidos a Emilio Alarcos Llorach, 1, Universidad de Oviedo, 1977, pp.1-14.

(3) In view of the definitions of this and the above types of phonological oppositions, Trubetzkoy redefines a correlation as being a "privative, proportional, bilateral" (p.84) opposition.

that "the opposition member that is characterized by the presence of the mark is called 'marked', the member characterized by its absence 'unmarked' (ibid). An example of this type of oppositions is the opposition between "voiced" and "voiceless" consonant phonemes.<sup>(1)</sup> On the other hand, gradual oppositions are defined as "oppositions in which the members are characterized by various degrees or gradations of the same property" (ibid). An example of this type of oppositions is the opposition between vowels of different degrees of opening such as German u-o, ü-ö, i-e.<sup>(2)</sup> Trubetzkoy (ibid) notes that gradual oppositions are smaller in number and less important than privative oppositions. As regards equipollent oppositions, they are defined as "oppositions in which both members are logically equivalent, that is, they are neither considered as two degrees of one property nor as the absence or presence of a property" (ibid). Equipollent oppositions are said to be the most frequent of all types of oppositions in any phonological system. Examples of these are p-t and f-k in German. Towards the end of his discussion of this criterion of classification, Trubetzkoy notes that "the classification of concrete oppositions into gradual or privative oppositions thus depends partly on the structure and partly on the functioning of the phonemic system" (p.77).

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(1) In this example, among others, Trubetzkoy seems to believe that opposition takes place between relevant features. But I, among other functionalists, believe that opposition takes place between phonemes in given utterances (i.e. words or monemes).

(2) Concerning the degree of a particular property, Trubetzkoy notes that "the member of a gradual opposition that possesses an

Finally, on the basis of the extent of their distinctive force, phonological oppositions are divided into two types: constant and neutralizable. A constant opposition is defined as a "distinctive opposition whose members are independent phonemes" (ibid) in all conceivable positions, e.g. the opposition between /ɛ/ and /e/ in Danish. A neutralizable opposition, on the other hand, is, as explained in Principles (pp.77f), a phonological opposition whose distinctive force is valid in some but not all conceivable positions; the positions in which a given opposition ceases to be valid are considered the positions of neutralization and those in which the respective opposition is valid are considered the positions of relevance.<sup>(1)</sup> For example, the German opposition t-d is neutralizable because, of all its conceivable positions, the final position is the position where this opposition ceases to be valid (i.e. the position of neutralization).

From the above account, therefore, it is fair to say that Trubetzkoy's classification of oppositions is of prime importance in phonological analysis as it is highly exhaustive and replaces previous vague and inadequate classifications.<sup>(2)</sup>

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contd. from previous page: extreme (either minimal or maximal) degree of the particular property is the extreme or external member, while the other member is the mid member" (p.75).

(1) See sections 4.3 and 4.7 - 4.10 of this thesis.

(2) For an evaluation of Trubetzkoy's classification (contained in his Grundzüge) and how it differs from the binary theory of Jakobson and his Harvard group (i.e. the 'distinctive-feature' theory), see J. Vachek's LSP, pp.58-60.

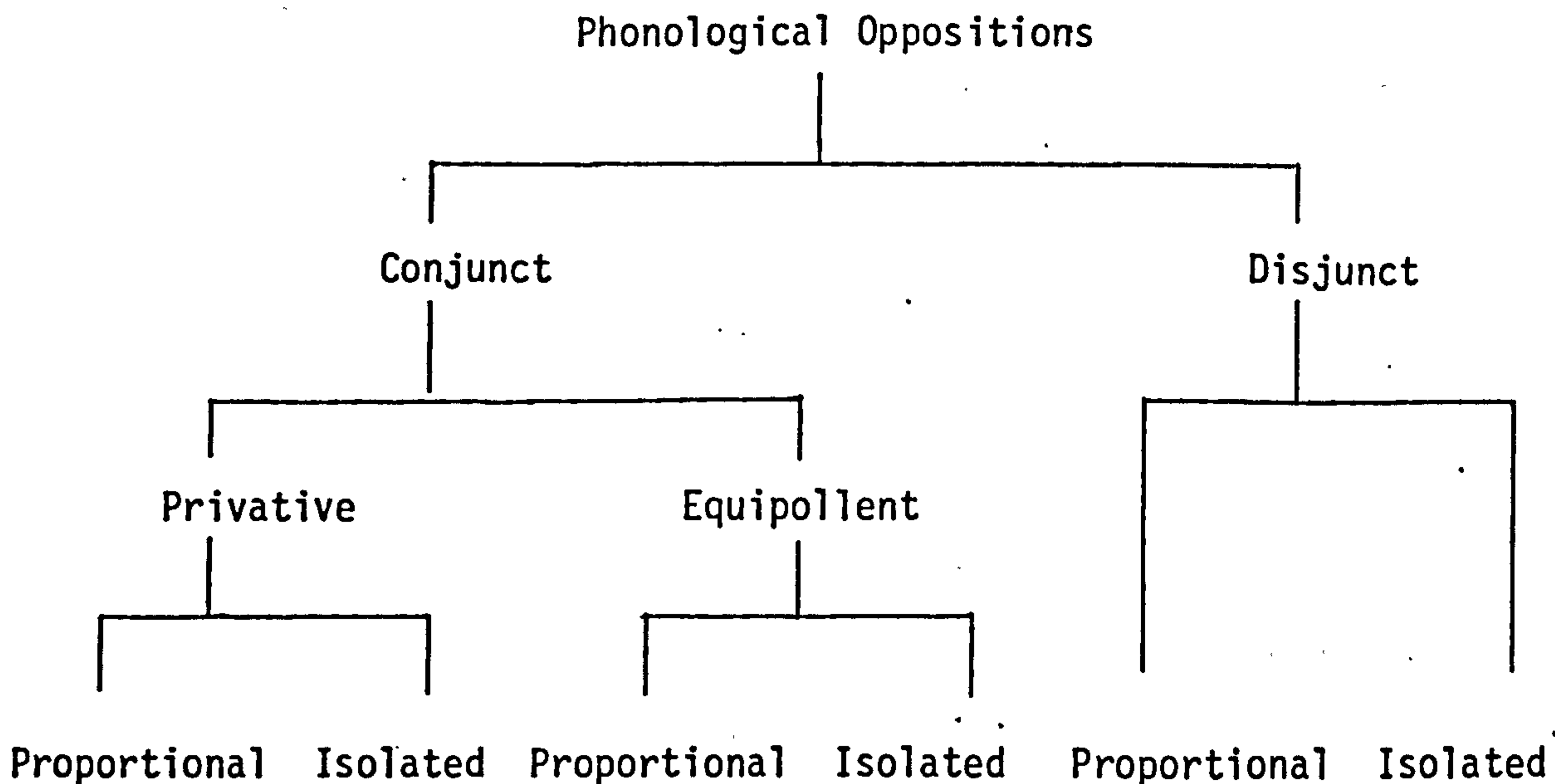
B. Trnka (in the revised new edition of his Phonological Analysis... cit) derives his classification of oppositions from Trubetzkoy's of 1936 and 1939;<sup>(1)</sup> Trnka's is a simplified and sketchy version. As the title of his book suggests, Trnka applies his classification of phonological oppositions to English.<sup>(2)</sup> Trnka classifies the phonological oppositions of English "according to the number of relevant features which their terms have in common" (ibid, p.12). Consequently, he distinguishes two major types of phonological opposition: conjunct and disjunct. Conjunct oppositions are conceived as those phonological oppositions the terms of which "differ from each other by one and only one relevant feature" (ibid). Subsequently, Trnka subdivides 'conjunct oppositions' into privative and equipollent oppositions. A conjunct opposition is said to be privative "if one term of the opposition is differentiated from the other by an additional relevant feature" (ibid). On the other hand, a conjunct opposition is called equipollent "if both terms of the opposition have the same relevant features, with the exception of one which is different" (ibid). Accordingly, English t/d is a (conjunct) privative opposition because the relevant feature of voice is possessed by /d/ and is missing in /t/. On the other hand,

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(1) I say 'derives' in the sense that Trnka adopts some of Trubetzkoy's concepts (such as 'privative') and terms (such as 'equipollent').

(2) Trnka's chapter which deals with the classification of phonological oppositions was not included in the original edition of 1935 published in Prague.

English p/f, b/v, t/θ, d/ð and k/h are (conjunct) equipollent oppositions "as the terms of each pair differ from each other by being either plosives or fricatives" (*ibid*). Disjunct oppositions include all other phonological oppositions that do not belong to conjunct oppositions. That is to say, disjunct oppositions are those phonological oppositions that "are constituted by terms distinguished from each other by two, or more, relevant features" (p.13). Examples of this type of opposition are, English p/v, b/f, t/ð, d/θ, ʃ/dʒ, ʒ/tʃ, p/d, b/t, p/g, b/k, f/ð, v/θ, m/b, z/ʃ, h/ŋ, and w/ŋ. In addition, Trnka states that both conjunct and disjunct oppositions may be either proportional (if the one or more relevant features by which the opposition members are distinguished from each other recur in at least another pair of opposition members), or isolated (if the relevant features by which the two opposition members are distinguished from each other do not recur in the members of any other phonological opposition). For example, the opposition r/l is, in English, equipollent and isolated; p/b, t/d, k/g, f/v, θ/ð, tʃ/dʒ; ʃ/ʒ and s/z are privative and proportional; p/f, b/v, t/θ, d/ð, k/h, p/t, b/d, p/k, b/g, t/k and d/g are equipollent and proportional; and p/v and t/ð are disjunct and proportional. A summary of Trnka's classification can be represented by the following diagram:



#### 6.4. Phonological Classification of Distinctive Oppositions.

What has, in the previous section, been labelled as a 'logical classification' applies not only to phonological systems but also to any system of oppositions. What is needed for phonological systems to be successfully analyzed is a phonological classification of their oppositions on top of the above logical classification. Trubetzkoy, (Principles..., pp.90-226) presents a largely detailed phonological classification of distinctive oppositions. In this connexion, Trubetzkoy distinguishes between word-differentiating oppositions (i.e. lexical oppositions) and sentence-differentiating oppositions (i.e. syntactic oppositions). According to Trubetzkoy, this kind of classification of distinctive oppositions "is certainly of importance for the phonemic systems of the individual languages" (p.91), while "it is less

important for the general classification of distinctive oppositions, for all distinctive oppositions that appear with a syntactic function in one language may occur with a lexical function in another language" (ibid).

What Trubetzkoy regards as a general classification of phonological oppositions ('general' in the sense that it can be applied to the 'various languages of the world') is a classification which is based on the fact that phonological oppositions are phonic oppositions. That is to say, in addition to the purely logical concepts used for the logical classification, phonetic concepts are needed. A general phonological classification of oppositions will therefore consist in "a systematic survey of the phonic [i.e. acoustic or articulatory, A.R.] properties that are in effect utilized for the differentiation of meaning in the various languages of the world" (p.92). Accordingly, Trubetzkoy distinguishes three classes of phonic properties that form distinctive oppositions in the various languages of the world: vocalic, consonantal and prosodic.

We read:

"Vowel phonemes consist of distinctive vocalic properties, consonantal phonemes of distinctive; consonantal properties; but there are no phonemes that consist exclusively of prosodic properties. Depending on the language, prosodic properties may combine with a single vowel

phoneme, a single consonantal phoneme, or an entire sequence of phonemes. "ibid"<sup>(1)</sup>

#### A. Vocalic Properties:

Trubetzkoy (Principles..., pp.95-122) distinguishes three types of vocalic properties:<sup>(2)</sup> (1) properties based on degree of aperture, (2) properties of localization or timbre, and (3) properties of resonance.<sup>(3)</sup> The first two types may be combined into one special group, as they are phonetically "much more related to each other than to the properties of resonance"(p.95). In view of these two types of vocalic properties, vowel systems

(1) For Trubetzkoy's views on vowels, consonants and prosodic units, see Principles..., pp.93-95. In brief, Trubetzkoy summarizes the process of human speech phonation as follows:

"...somebody whistles or sings a melody into the mouthpiece of a tube and alternately opens and covers the other end of that tube with his hand."(p.93)

Trubetzkoy (pp.93f) states that in the course of this process, three types of segments can acoustically be distinguished: "first, the segments between closing and opening the orifice; second, the segments between opening and closing it; and third, the segments of the melody whistled or sung into the tube. Elements of the first type correspond to consonants, elements of the second type to vowels, and those of the third type to prosodic units." [emphasis added]

(2) Trubetzkoy discusses the vocalic properties for the first time in his "Zur allgemeinen Theorie der phonologischen Vokalsysteme", op.cit. He discusses them again in his Grundzüge, pp.86-114 (= Principles, pp.95-122).

(3) In the case of languages in which the prosodic units are nothing but vowels, the prosodic properties may be added to the vocalic properties. Nevertheless, the prosodic properties should, in any classification, be kept distinct from the vocalic properties proper. See footnote (2) on p.165 of this thesis; see also Prosodic Properties (i.e. (c) of the present section).



are grouped into: linear systems in which only properties that are based on degree of aperture are distinctive (properties of localization being non-distinctive); triangular systems in which all vowel phonemes have distinctive properties based on degree of aperture but not all vowel phonemes have distinctive properties of localization; and quadrangular systems in which all vowel phonemes have distinctive properties based on degree of aperture as well as distinctive properties of localization.

(1) Properties of Localization or Timbre:

Trubetzkoy notes that distinctive properties of localization<sup>(1)</sup> (or timbre) are possessed by all vowel phonemes (of a triangular system) except the 'maximally open' vowel phoneme, which is "outside the oppositions of localization" (p.97).

Trubetzkoy further notes that "in the overwhelming majority of languages, the properties of timbre of the vowel phonemes are distinctive" (p.98). However, properties of localization (or timbre) are characterized as being non-distinctive if "they are

(1) Fischer-Jørgensen (Trends..., pp.31f) states that 'localization' is also called 'Eigenton' (i.e. 'proper tone', F-J), a term used at the time when each vowel was believed to be characterized by a specific tone. She writes:

"Trubetzkoy describes high "Eigenton" as prominence given to high overtones, and low "Eigenton" as prominence given to low overtones. This corresponds to what would now be described in acoustic terms as the position of formant 2." (p.32)

Moreover, Fischer-Jørgensen shows the inaccuracy of the term 'localization'. We read:

"He [i.e. Trubetzkoy, A.R.] also employs the term "Helligkeit" ('brightness'), vowels with high

automatically conditioned by the phonic environment" (p.97), as in the case of Adyghe.

Oppositions of timbre are of two types: opposition of lip rounding (i.e. "rounded" vs. "unrounded" vowels), and opposition of tongue position (i.e. "back" vs. "front" vowels). Accordingly, the triangular and quadrangular systems are divided into two-class, three-class and four-class systems,<sup>(1)</sup> e.g.:

a	a	æ
o e	o	e
u i	u	i

(a triangular two-class system)      (a quadrangular two-class system)

(2) Properties Based on Degree of Aperture:

Trubetzkoy makes it clear that every language has a vowel system with oppositions based on degree of aperture.<sup>(2)</sup> He refutes J. van Ginneken's argument that there are vowel systems with oppositions based on properties of timbre but no oppositions based on degree of aperture (see Principles..., pp.105f).

contd. from previous page:- Eigenton being bright, and vowels with low Eigenton dark. As the brightness of a vowel (or the height of its second formant) is conditioned both by the place of articulation and by the degree of rounding, the term "localization" is rather inaccurate. Trubetzkoy himself admits this, but he probably uses it in the headings to obtain a certain parallelism with the consonants. In the text he most often uses "Eigenton" or "Helligkeit".<sup>(ibid)</sup>

(1) For definitions and details of these types of systems, see Principles..., pp.98-104.

(2) 'Degree of aperture' (i.e. tongue height) is also called 'sonority' (Schallfülle) and 'saturation' (Sättigung).

Furthermore, Trubetzkoy remarks that "just as all vowel phonemes with the same property of timbre form a 'class of timbre' within a given vowel system, all vowel phonemes with the same degree of aperture... can be comprised under one 'degree of sonority' within the same system" (p.106). It follows that vowel systems can be divided into two-degree, three-degree, four-degree systems, etc., e.g.:

a	a e	a e	a
u i	o i	u ü i	o e
			u i

(a two-degree, two-class triangular system)	(a two-degree, two-class quadrangular system)	(a two-degree, three-class quadrangular system)	(a three-degree, two-class triangular system)
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a	ä	a	a	a
o	e	ø	ɛ	o
u	i	ø	ɛ	u
		u	i	u

(a three-degree, two-class quadrangular system)	(a four-degree, two-class triangular system)	(a four-degree, two-class quadrangular system).
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### (3) Resonance Properties

Properties of resonance bear no relation to either of the major groups of vocalic properties, viz. the properties of localization or timbre and the properties which are based on degree of aperture or sonority. Trubetzkoy defines oppositions of resonance as being 'all "distinctive oppositions" between "pure" vowels and vowels that are somehow "impure"' (p.118).

Accordingly, two types of oppositions are distinguished: (a) the correlation of nasalization in which the opposition is between "non-nasalized" (i.e. "pure") and "nasalized" (i.e. "impure") vowels, and (b) the correlation of muffling in which the opposition is between "clear" (i.e. "pure") and "muffled" (i.e. "impure") vowels.<sup>(1)</sup> The vowel system of Burmese exhibits an example of the correlation of nasalization:

a ɔ    ε o    e u    i	ā āu    āi ōu    ēi ū    ĩ
(non-nasalized vowels)	(nasalized vowels)

The correlation of muffling, compared with the correlation of nasalization is not as common in languages. More specifically, it is mostly African languages that have distinctive oppositions between "clear" and somewhat "muffled" vowels. Like the correlation of nasalization the correlation of muffling can affect

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(1) The phonetic nature of vowel "muffling" is rather unclear, since the correlation of muffling does not always involve the same correlations in the various languages. In connexion with the phonetic nature of vowel muffling in the Nilotic languages, for example, A.N. Tucker's observations (contained in his article "The Function of Voice Quality of the Nilotic Languages", in P.2nd ICPS, pp.125ff) are summarized by Trubetzkoy as follows:

"The results showed that in the case of the "squeezed vowels the faucal pillars are compressed and the velum is lowered, without, however, enabling the flow of air to escape through the nose. In the case of "breathy" vowels the velum is raised, the fauces retracted and the larynx clearly lowered, so that quite a large cavity is formed behind the oral cavity proper. The glottis appears to be in the position of whispering." [Principles..., p.121]

For a summary of other scholars' observations of vowel "muffling" in other languages, see Principles..., pp.121f.

either the entire vowel system (as in the case of some Nilotic languages), or only part of the vowel system (as in the case of the Abua vowels /e/ and /o/).<sup>(1)</sup>

#### B. Consonantal Properties:

Like the 'vocalic properties', the 'consonantal properties'<sup>(2)</sup> are divided into three major groups: (1) properties of localization, (2) properties based on the manner of overcoming an obstruction, and (3) resonance properties.<sup>(3)</sup>

##### (1) Properties of Localization:

In all languages, the consonantal properties of localization are generally phonologically relevant (i.e. distinctive).

(1) As regards the phonological interpretation of "nasalized" vowels and "muffled" vowels, Trubetzkoy writes:

"Phonetically nasalized vowels are very often only the realization of the phoneme sequence "vowel + nasal", and the vowels accompanied by a noise of laryngeal friction [i.e. "muffled" vowels, A.R.] are only the realization of a combination of a vowel phoneme with a laryngeal consonantal phoneme." [p.122]

(2) Before they were discussed in Grundzüge (i.e. Principles..., pp.122-169), 'consonantal properties' had already been dealt with in Trubetzkoy's "Die phonologischen Systeme" (TCLP, 4, pp.96-116).

(3) The first two types correspond to what are now more commonly known as 'place of articulation' and 'manner of articulation', respectively. The third type, on the other hand, only covers 'nasality'. There are languages that have consonant phonemes that are outside the localization series, e.g. /l/, /r/ and /h/. For my treatment of SIA /l/, /r/ and /h/, see sections 10.20, 10.19 and 10.31, respectively (see also section 10.32).

In other words, every language may have individual consonant phonemes with non-distinctive properties of localization. The sum of all (may be only one) consonant phonemes that possess the same distinctive properties of localization is called a series of localization. In addition, according to the type of relation between the individual series of localization of the same consontal system, three types of series are distinguished: the basic series (Grundreihen), the equipollent related series (äquipollente Schwesterreihen), and the secondary series (Nebenarbeitsreihen).

Trubetzkoy conceives of the basic series (Principles..., pp. 123-125) as "those consontal series of localization that stand in a relation of heterogeneous multilateral opposition to each other" (p.123). In almost all languages, some of these basic series exist. The basic series include the gutturals (i.e. dorsals), the apicals (i.e. dentals and alveolars), and the labials (i.e. bilabials and labio-dentals).<sup>(1)</sup>

The equipollent related series (Principles..., pp.125-129) exist in cases that "involve a 'split' of a basic series into two<sup>(2)</sup> 'related series' which stand in a relation of bilateral

(1) The basic series also include the "sibilants". But due to the fact that "the upper and back portion of the resonating cavity is approximately the same for sibilants and apicals [i.e. there is a certain relatedness between the two series of localization, A.R.],...in some languages they unite into a single series under certain circumstances" (Principles..., p.123). The basic series furthermore, include other, though less common, series of localization, viz. the "laterals", the "gutturo-labials" (i.e. labio-velars), the "palatals", and the "laryngeals".

(2) Trubetzkoy (Principles..., p.128) notes that "there are cases in which a basic series is split not into two but three series, and these series stand in a relation of gradual opposition to

opposition to each other but in a relation of multilateral opposition to all other series of localization in the same system" (p.126). That is to say, the relation between the series of "labials", "apicals", "dorsals", "sibilants", "laryngeals", "laterals", "palatals" and "labiovelars" (all of which are basic series) is that of multilateral (and heterogeneous) opposition, while the series of "bilabials" and "labiodentals", "predorsals" and "postdorsals", pure "laryngeals" and "pharyngeals", etc. stand in a relation of bilateral equipollent opposition to each other.

The secondary series (Principles..., pp.129-140), on the other hand, exist in languages "in which the basic and the related series are split into two series each, which stand in a relation of privative [and proportional, A.R.] opposition" (p.129). In the case of the secondary series, the vocal organs that are not involved in the 'basic task' (i.e. primary articulation) are involved in another 'secondary task' (i.e. secondary articulation). When the secondary series stand in a relation of privative, proportional opposition, they form correlations. Correlations arising from opposing the secondary series to their corresponding basic or related series are divided into correlations of timbre and click correlations. Correlations of timbre include "palatalization", "emphatic palatalization", "emphatic velarization"

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contd. from previous page:- each other". Such cases are said to be very rare, e.g. the basic "guttural" series which is, in Tsimshian, Chinook and Hupa, split into a post-velar series, a prevelar series and a palatal series.

(i.e. 'emphasis' or 'təfxim'<sup>(1)</sup>), "rounding or labialization" and "retroflexion". The click correlations, on the other hand, exist in a very limited range of languages; they only occur in a few Southern Bantu languages, e.g. Zulu. Clicks can be apical, palatal, or lateral. The click correlations include "gutturalization" and "labialization".

(2) Properties Based on the Manner of Overcoming an Obstruction:

These properties are divided into three types on the basis of different degrees of obstruction: first degree, second degree and third degree.

Correlations based on the manner of overcoming an obstruction of the first degree (Principles..., pp.140-144) result from the opposition between three degrees of obstruction, i.e. the opposition between "occlusives" (which have the highest degree of obstruction), "fricatives" (which have a medial degree of obstruction), and "sonorants" (which have the lowest degree of obstruction). When opposed to "fricatives" and "sonorants" (both constituting what are known as "continuants"), "occlusives" are said to be "momentary sounds" (Momentanlaute).<sup>(2)</sup> But both "occlusives" and "fricatives" are labelled as "obstruents"

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(1) For details on "emphatic velarization" (i.e. 'təfxim'), see Principles..., pp.131f and sections 8.1 - 8.6 of this thesis.

(2) As Baltaxe (see Principles..., footnote on p.141) states, the term 'Momentanlaut' corresponds to the more familiar term 'stop'. She adds that Trubetzkoy only uses the former term to distinguish between "Momentlaut" and "Dauerlaut" (i.e. continuant). But when continuants are divided into "fricatives" and "sonorants", Momentanlaut accordingly becomes "occlusive".



when opposed to "sonorants".

Correlations based on the manner of overcoming an obstruction of the second degree (Principles..., pp.144-160) involve "bilateral oppositions between phonemes having the same degree of obstruction (and belonging to the same series of localization)" (p.145). These correlations are divided into six groups: the correlation of tension (i.e. the opposition between "fortis" and "lenis" consonants), the correlation of intensity (i.e. the opposition between "short aspirated" and "long unaspirated" consonants), the correlation of voice (i.e. the opposition between "voiced" and "voiceless" consonants), the correlation of aspiration (i.e. the opposition between "aspirated" and "unaspirated" consonants), the correlation of recursion (i.e. the opposition between "infraglottal" and "ejective"<sup>(1)</sup> consonants), and the correlation of release (i.e. the opposition between "explosives" and "injectives").

Finally, correlations based on the manner of overcoming an obstruction of the third degree (Principles..., pp.160-165) only concern the phenomenon of gemination (i.e. the doubling of a given consonant). In other words, they involve the opposition between "geminated"<sup>(2)</sup> and "non-geminated" (or "simple") consonants. The correlation of gemination should be distinguished from the correlation of intensity (see Principles..., pp.163f

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(1) For a definition of this term and other names proposed for it, see Principles..., note 136 on p.217.

(2) Two facts must be remembered concerning "geminated" consonants

for details).

### (3) Resonance Properties:

The resonance properties of consonants (Principles..., pp.165-169) only involve the opposition between "nasal"<sup>(1)</sup> and "oral" consonants. Generally speaking, nasals stand in a relation of bilateral, proportional opposition to the occlusives of the same system. Furthermore, in certain languages a 'genuine' correlation of nasals must be distinguished from a correlation of "seminasals" (i.e. nasalized consonants).

### C. Prosodic Properties (see Principles..., pp.170-207):

According to Trubetzkoy (and Jakobson) prosodic properties<sup>(2)</sup> are possessed by a 'syllable' or 'part' of a syllable (i.e. a

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contd. from previous page:- (or "geminate"): (a) they are distributed over two syllables in intervocalic position, and (b) they involve a polyphonemic interpretation; see sections 8.7-8.13 of this thesis.

(1) It is to be remembered that nasals are always sonorants though the oral cavity is completely closed in their articulation. In other words, they are produced with the lowest degree of obstruction.

(2) 'Prosodic properties' were first discussed by Trubetzkoy in 1929 (see his "Zur allgemeinen..." op.cit), then by Jakobson in 1931 (see his "Die Betonung und ihre Rolle in der Wort - und Syntagmaphonologie", TCLP, 4, pp.164-183; reprinted in SW, 1, pp.117-136) and again by Jakobson in 1937 (see his "Über die Beschaffenheit der prosodischen Gegensätze", in Mélanges van Ginneken, pp.25-33; reprinted in SW, 1, pp.254-261). In the meantime Trubetzkoy presented a new account of prosodic properties in 1935 (see his Anleitung zu phonologischen Beschreibungen). Moreover, an elaborated and exhaustive systematization appeared in Trubetzkoy's Grundzüge (i.e. Principles..., pp.170-207). A summary of Trubetzkoy's systematization is contained in

'mora' (1). But in his earlier writings Trubetzkoy was inclined to believe that prosodic properties are only possessed by vowels and so they were considered to be included in the vocalic properties; consequently, they were discussed together with the degrees of sonority and classes of timbre. (2)

Trubetzkoy (Principles..., pp.182-201) classifies prosodic properties on the basis of the concept of the 'prosodeme' which he defines as "the smallest prosodic unit of a given language, in other words, the syllable in syllable-counting languages and

contd. from previous page:- Fischer-Jørgensen's "Phonologie", Archiv für vergleichende Phonetik, 5, 1941, pp.170-200. For a critical account of Trubetzkoy's system of prosodic properties, see W. van Wijk, "Quantiteit en intonatie", Mededelingen der Koninklijke Nederlandse Akademie van Wetenschappen, 3/1, Amsterdam, 1940. For a more recent system, see Martinet's "Accents et tons", Miscellanea phonetica, 2, 1954, pp.13-24 (reprinted in a revised version in his La linguistique synchronique...cit, pp. 141-161).

(1) Trubetzkoy does not seem to give an actual definition of a 'mora'. But I feel it is necessary to include one here and for this purpose I quote Martinet's definition which reads: "...each of the segments characterized by one of the successive punctual tones is called a mora" (Elements..., p.80); a succession of two punctual tones constitutes a 'melodic tone', e.g. a rising tone (which is a melodic tone) is a succession of a low tone and a high tone (i.e. two punctual tones).

(2) Trubetzkoy (Principles..., p.170) admits that it was wrong of him to consider prosodic properties as belonging to the vowel. However, it is generally agreed that the vowels of any given language function as syllabic nuclei. For details on syllabic nuclei and their phonematic interpretation, see (ibid, pp.170-181).

the mora in mora-counting languages" (p.182).<sup>(1)</sup> Accordingly, prosodic properties are divided into differential properties and properties based on the type of contact (Differenzierungs- und Anschlussarteigenschaften). The former distinguish between the prosodemes themselves, whereas the latter only characterize the types of contact between the prosodemes and the following phonological element.

The 'differential' prosodic oppositions are divided into two types: culminative oppositions (e.g. the correlation of accent,<sup>(2)</sup> and the correlation of tone movement) and non-culminative oppositions (e.g. the correlation of prosodic intensity and gemination in syllable-counting languages, and the correlation of tone register in mora-counting languages).

On the other hand, the prosodic oppositions based on the 'type of contact' are divided into two types: the correlation of stød (or the correlation of interruption) and the correlation

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(1) A full understanding of this definition requires an understanding of the concepts of syllable-counting and mora-counting languages. Trubetzkoy conceives of syllable-counting languages as those languages "in which the prosodic units always coincide with their syllables", (Principles..., p.177) as opposed to mora-counting languages in which "the smallest prosodic unit does not always coincide with the syllable" (ibid).

(2) Trubetzkoy (p.188) defines the 'accent' as "the culminative prominence of a prosodeme". This prominence can phonetically be realized as "expiratory increase in force, rise in pitch, lengthening, or more precise and more emphatic articulation of the vowels or consonants involved" (ibid).

of close contact.<sup>(1)</sup>

In addition, Trubetzkoy (Principles..., pp. 201-207) distinguishes between word-differentiating and sentence-differentiating oppositions<sup>(2)</sup> (i.e. lexical vs. syntactic oppositions, respectively). To the former type belong the distinctive consonantal and vocalic properties and also the prosodic properties discussed above. On the other hand, sentence-differentiating oppositions are distinctive prosodic properties such as sentence-intonation, differences of tone distinctive for sentences, sentence stress, and sentence pauses.

The above phonological classification of distinctive oppositions can be summarized as follows. Distinctive oppositions are achieved by means of distinctive properties (i.e. relevant features). In every language, the distinctive properties can generally be grouped into three major classes:

(a) vocalic properties, which can be divided into (1) properties of localization, (2) properties based on degree of

(1) Trubetzkoy notes that "the correlation of stød occurs only in languages that have a correlation of prosodic gemination, that is, in mora-counting languages" (p. 198), whereas "the relationship of the correlation of close contact to the classification of languages into mora-counting and syllable-counting languages is less clear" (p. 199). For details on 'the correlation of close contact', see Principles ..., pp. 199-201.

(2) It should be borne in mind that prosodic properties that differentiate sentences are independent linguistic signs, while phonemes and prosodic properties that only differentiate words are never linguistic signs but only parts of linguistic signs; see Principles ..., p. 207.

sonority (or aperture), and (3) resonance properties;

(b) consonantal properties, which can be divided into (1) properties of localization, (2) properties based on the manner of overcoming an obstruction, and (3) resonance properties; and

(c) prosodic properties, which can be divided into (1) differential properties (word- as well as sentence-differentiating properties), and (2) properties based on the type of contact.

PART TWO

APPLICATION: A FUNCTIONAL PHONEMATIC  
ANALYSIS OF SPOKEN IRAQI  
ARABIC.

## Chapter Seven

INTRODUCTORY CHAPTER7.1. The Dialect Studied.

This research concerns itself with SIA, which is an Arabic dialect spoken in Iraq. More specifically, this thesis mainly studies the dialect spoken in the Iraqi capital of Baghdad. I have decided to restrict my research to the Baghdadi dialect for a number of reasons. Firstly, it is almost impossible to work out an exhaustive, satisfactory analysis of the colloquial Arabic spoken in Iraq. This is because there are, in my view, three major dialects spoken in Iraq: (a) a southern Iraqi dialect represented by the speech of the inhabitants of Basrah (the second largest city), (b) a northern Iraqi dialect represented by the speech of the inhabitants of Mosul, and (c) a dialect spoken in the central part of Iraq and represented by the speech of the inhabitants of Baghdad (the capital). Within the Baghdadi dialect, furthermore, there exist some regional variations basically in pronunciation, but these variations do not, in my opinion, affect the phonemic system of Baghdadi Arabic.<sup>(1)</sup> The geographical divisions of SIA are shown on the following map:

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(1) In his article "The Development & Distribution of the Arabic Sound Qāf in Iraq" (in RAL, pp.103-112; reprinted from Essays on Islamic Civilization, edited by D.P. Little and E.J. Brill, Leiden, 1976, pp.48-55), S.H. Al-Ani writes:

"Ibrahīm al-Samarrāʾī in his book, al-Tawzīʿ al-Lughawī al-Jughrafī fī al-ʿIrāq (Linguistic Geographical Distribution in Iraq), divided the Arabic dialect in Iraq into two main groups - social and geographical, He further sub-divided





A MAP OF IRAQ SHOWING THE LOCATION OF THE THREE MAJOR *muḥafəḏat* (i.e. PROVINCES) WHEREBY THE THREE MAJOR DIALECTS ARE REPRESENTED (IT ALSO SHOWS THE COUNTRIES BORDERING IRAQ).

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contd. from previous page:- the social group into urban, rural, and nomadic, and the geographical group into north, central and south. The northern geographical sub-group mainly refers to the 'qeltu' dialect (I said) yet the writer does not draw the line far enough south to include the second main town of Hit." [p.111, footnote 7]

For Al-Ani's own division of the Iraqi dialect, see ibid, pp.105ff.

Secondly, it is extremely hard to collect the necessary data required for a phonematic analysis of Iraqi Arabic in general because of the wide range of variety of accents and dialects existing in Iraq. For practical purposes, therefore, I have relied on my own speech for the data required - my speech being representative of the Baghdadi dialect since I was born in Baghdad and have lived all my life there - and tested the validity of the data through every day verbal contact with my compatriots studying in Leeds. The only possibility of a study of standard Iraqi Arabic would, in my opinion, be that of studying the Iraqi Arabic spoken on radio, television, etc. which does not represent everyday speech. For the above two reasons, I have decided to study, in detail, the Arabic dialect spoken in Baghdad, which is generally thought of as "representative of educated Iraqi speech in other areas".<sup>(1)</sup> Finally, it is worth mentioning that Baghdadi Arabic is spoken by a population approaching four million Iraqis (out of the total population of approximately thirteen million native Iraqis).

## 7.2. Segmental Notation

In this section, I shall explain the segmental notation used in this part of the thesis, i.e. the transcription of the SIA phonemes and archiphonemes.<sup>(2)</sup> The transcription to be

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(1) Ibid, p.105.

(2) If a given SIA phoneme (or archiphoneme) has one or more phonetic realizations that are to be transcribed by symbols different from the symbol used for the corresponding phoneme (or archiphoneme), a footnote will account for the phoneme (or archiphoneme) concerned.

employed here is in accordance with the principles of the International Phonetic Association (IPA)<sup>(1)</sup> except for the following cases:

(a) Consonant 'təfxim' (usually referred to as 'velarization' in IPA terminology) is, for the sake of typographical clarity, indicated by a dot placed under (instead of the symbol ~ drawn across<sup>(2)</sup>) the symbol of the respective 'plain' (i.e. non-*ṡufəxxəm*) consonant, e.g. /ɬ̣/ (as opposed to /ɬ/) instead of /ɬ̣̄/ (as opposed to /ɬ/).

(b) The phonemic symbols /č/ and /ǧ/ are used instead of /tʃ/ and /dʒ/, respectively, in compliance with my interpretation of the phonological status of [tʃ] and [dʒ] in the phonological system of SIA (see section 8.14 of this thesis). The choice of the symbols /č/ and /ǧ/ is based on their use by most scholars who have worked in the field of Arabic linguistics. However, /ʃ/ rather than /š/ is retained in my notation despite the fact that /ʃ/ is, according to my analysis, like /č/ and /ǧ/ characterized by the relevant feature "hush". This is so because there is not the least doubt about the phonological status of /ʃ/, i.e. /ʃ/ can only be interpreted monophonematically.

(c) Since the phoneme /q/ is distinctively characterized as being "*ṡufəxxəm*" in SIA, it is transcribed, in line with the

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(1) See the IPA's pamphlet: The Principles of the International Phonetic Association, London, 1949, (reprinted 1970 and 1975). Phonetic transcriptions will, for simplicity's sake, be made as brief as possible.

(2) The symbol ~ is used to account for vocalic nasalization

other "ḡufəxxəmə" phonemes, as /ḡ/. According to my analysis, /ḡ/ is the "ḡufəxxəmə" counterpart of /k,g;x,ɣ/ but I have given it the symbol /ḡ/ since it is phonetically more related to [k] than to [g,x,ɣ]; to be more specific, both [ḡ] and [k] are, phonetically speaking, voiceless plosives.

(d) Finally, archiphonemes are, in this analysis, transcribed by means of capital letters. For example, the archiphoneme occurring in the position of neutralization of the opposition between /p/ and /b/ is transcribed as /P/.

In view of the conventions of the IPA and the above exceptions, I present a table of the phonemic inventory of SIA which also includes the Arabic symbols corresponding to each phoneme together with an Arabic example for each phoneme followed by its English translation:

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contd. from previous page:- when placed on top of vowel symbols, e.g. [mī:m] 'the name of the letter "m"'. It is also used with a non-segmental function, see section 7.3 of this thesis.

## (a) Consonant Phonemes: (1)

phoneme	corresponding Arabic symbol	example	meaning
/p/	پ	/'pɑrdə/	'curtain'
/b/	ب	/'bɑrdə/	'a cold spell of weather'
/f/	ف	/fil/	'elephant'
/m/	م	/mæi/	'name of a girl'
/m̄/	م	/m̄æi/	'water'
/t/	ت	/tin/	'figs'
/d/	د	/din/	'religion'
/t̄/	ط	/t̄in/	'mud'
/θ/	ث	/'niθær/	'he spread'
/ð/	ذ	/'niðær/	'he promised to give a sacrifice'
/ð̄/	ض or ظ	/'nið̄ær/	'he looked'

(1) For those readers with some knowledge of Arabic writing, I mention the following facts about the SIA consonants:

(a) All consonant letters (e.g. 'ب') take four (mostly different) shapes determined by their position in the word: (ب) word-initially and word-medially when joined to the following but not preceding letter (e.g. بو); (ب) word-medially when joined to the preceding letter and the following letter at the same time (e.g. عبو); (ب) word-finally when joined to the preceding letter (e.g. عب); and (ب) in isolation as well as word-finally when not joined to the preceding letter (e.g. عرب). The last shape is the one found in the consonant table contained in this section.

(b) The phoneme /ð̄/ is represented by (ض) in some words and by (ظ) in others. It is worth mentioning that these two symbols represent two separate phonemes in CA (viz. /ð̄/ and /ð̄̄/, respectively).

(c) Two distinct phonemes may be represented by one and the same Arabic symbol, namely (م) for /m/ and /m̄/, and (ن) for /n/ and /n̄/.

(d) Consonant 'təfaiid' is, when non-distinctive, indicated by a length mark (: ) placed after the respective consonant symbol, e.g. [ħæ:l:] 'solution' (phonemically /ħæ:l/). When distinctive, on the other hand, it is indicated by doubling the respective consonant symbol, e.g. ['xæddæ] 'his cheek' (phonemically /'xæddæ/). See sections 8.7-8.13 of this thesis.

phoneme	corresponding Arabic symbol	example	meaning
/k/	ك	/kas/	'cup'
/g/	ك	/gas/ <sup>(1)</sup>	'he touched'
/x/	خ	/xas/	'special'
/ɣ/ <sup>(2)</sup>	غ	/ɣas/	'he dived'
/ḳ/	ق	/ḳas/	'he measured'
/n/ <sup>(3)</sup>	ن	/nas/	'people'
/r/	ر	/ras/	'head (n)'
/l/	ل	/'xalɪ/	'empty'
/ḷ/	ل	/'xalɪ/	'my (maternal) uncle'
/s/	س	/sef/	'sword'
/z/	ز	/zar/	'he visited'
/ṣ/	ص	/ṣef/	'summer'
/č/	ص	/čəf/	'hand, palm'
/ǧ/	ج	/ǧəf/	'it dried'
/ʃ/	ش	/ʃərf/	'evil or bad omen'
/h/	ح	/həl/	'solution'
/ʕ/	ع	/'ʕəbbəd/	'he paved'
/ʔ/	ء	/'ʔəbbəd/	'he became eternal'
/ḥ/ <sup>(4)</sup>	ه	/ḥəl/	'it or he came out'

(1) Some SIA speakers would also use /ǧas/, which shows that /g/ and /ǧ/ can be used in free variation. Nevertheless, they are phonologically regarded as two separate phonemes in SIA because they are in opposition to each other, e.g. /gad/ 'he held sb.'s hand' - /ǧad/ 'conscientious (sing.m.)'. See sections 10.14, 10.26 and 13.12 of this thesis.

(2) [ɣ] and [x] are combinatory variants of the phoneme /ɣ/; see section 9.16 of this thesis.

(3) [n, ṇ, ŋ, N] are combinatory variants of /n/; see section 9.18 of this thesis. The symbol [N] is an exception to my convention of restricting the use of capitals to the symbolization of archi-phonemes. In addition, the Arabic linguistic terms 'təfxim' and 'təfɖid' are written with a capital 'T' when occurring phrase or sentence initially and in headings or sub-headings, i.e. 'Təfxim...' and 'Təfɖid ...'.

(4) [ḥ] and [h] are combinatory variants of /h/; see section 9.31 of this thesis.

## (b) Vowel Phonemes: (1)

phoneme	corresponding Arabic symbol	example	meaning
/i/ (2)	ي	/fil/	'elephant'
/u/ (3)	و	/suf/	'wool'
/ɪ/	ِ or ي	/fil/	'unwrap! undo!'
/ʊ/	ُ or و	/suf/	'arrange in rows!'
/ə/ (4)	َ	/səd/	'dam'
/e/ (5)	ي	/wen/	'where?'
/o/ (6)	و	/moz/	'bananas'
/a/ (7)	ل	/səd/	'it prevailed'

(1) For those readers with some knowledge of Arabic writing, I mention the following facts about the SIA vowels:

(a) Some SIA vowels (e.g. /i/) are always represented by letters (i.e. 'ي') but others (viz. /ɪ/ and /ʊ/) are represented by letters word-finally (i.e. ي and و respectively) and by diacritics placed under or above consonant letters in non-final position (i.e. ِ and ُ respectively). As for the phoneme /ə/, it is always represented by a diacritic placed above the respective consonant symbol (i.e. َ, َ, َ, َ).

(b) Like the consonant letters, those vowel letters representing certain vowel phonemes (e.g. /i/) take four shapes (i.e. ي, ي, ي, ي).

(c) Two or more distinct vowel phonemes may be represented by one and the same Arabic symbol (namely /i,ɪ,e/ by 'ي' and /u,ʊ,o/ by 'و').

(d) Vowel length (or quantity) is indicated only in allophonic transcriptions as vowel length is non-distinctive in SIA (see section 8.16 of this thesis). A length mark (: ) is placed after the respective vowel realization to indicate vowel length, e.g. [a:, a:, o:].

(2) [j] and [i:] are combinatory variants of /i/; see section 9.32 of this thesis.

(3) [w] and [u:] are combinatory variants of /u/; see section 9.33 of this thesis.

(4) [ʌ] and [ə] are combinatory variants of /ə/; see section 9.36 of this thesis.

(5) [eə] and [e:] are free variants of /e/; see section 9.37 of this thesis. Since /e/ never appears orthographically word-initially, word-finally or in isolation, it can only be represented by two forms: (ِ) and (ِ).

(6) [œ] and [o:] are free variants of /o/; see section 9.38 of this thesis.

(7) [ɑ:] and [a:] are combinatory variants of /a/; see section 9.39 of this thesis.

## (c) Archiphonemes:

archiphoneme	corresponding Arabic symbol	example	meaning
/P/(1)	ب or پ	/ǧaP/	'he brought'
/M/(2)	ن or م	/Mfəttih/	'open(adj.); we open'
/L/(3)	ل	/Leʃ/	'why?'
/E/(4)	و or ي	/'ʕələ/	'on it or him'.

7.3. Non-segmental Notation

This type of notation concerns itself with symbols other than those of phonemes (or archiphonemes) and their realizations. The major non-segmental symbols are as follows:

a. / / is used to indicate a phonemic transcription of the 'signifiant' of a moneme (e.g. /l-/ 'a form of the definite article') or a syntagm (e.g. /'ʕələm/ 'flag', /l-'ʕələm/ 'the flag'); the symbols enclosed by / / naturally stand for phonemes, e.g. /ʕ/, /ə/, /l/, etc.

(1) [p] and [b] are combinatory variants of /P/; see section 13.2 of this thesis.

(2) [m, m̥, m̄, m̂] are combinatory variants of /M/; see section 13.3 of this thesis.

(3) /L/ is always realized as a 'non-mufəxxəm' lateral (i.e. [l]); see section 13.4 of this thesis.

(4) [e:] (or [eə]) and [o:] (or [oə]) are combinatory variants of /E/; see section 13.5 of this thesis.



- b. [ ] is used to indicate a transcription of variants (e.g. [b], [ɸ], [j] of respective phonemes (i.e. /b/, /ɸ/ and /j/). It is also used to enclose an addition by an author when quoting another author; see for example p.57 of this thesis.
- c. ( ) encloses a specific part of two transcribed monemes which are in opposition to each other; it is used to indicate that the given pair of monemes form a quasi-minimal pair, e.g. /'ʔ(o)prə/ 'opera' - /'ʔ(ü)brə/ 'needle'.
- d. " " is used, besides citational purposes, to enclose a relevant feature, e.g. "voiced" and "labial".
- e. ' ' is used, besides citational purposes, to enclose technical terms (e.g. 'neutralization', 'təʃdiə') or a phonetic feature in cases where it is phonologically irrelevant (e.g. 'bilabial' in connexion with the realization of /b/, and 'voiceless' in connexion with the realization of /ɸ/).<sup>(1)</sup>
- f. / is used to indicate an opposition, i.e. it separates two (or more) phonemes that are in opposition to each other (e.g. p/b indicating an opposition between /p/ and /b/, and p/t, k, etc. indicating an opposition between /p/ on the one hand and each of the phonemes /t/, /k/, etc. on the other). But to indicate an opposition between two monemes, a hyphen is used (e.g. /tin/-/din/).

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(1) On the phonological irrelevance of 'bilabial' and 'voiceless' in connexion with /b/ and /ɸ/ respectively, see sections 10.3 and 10.4 of this thesis.

g. ' is, when placed before the beginning of a syllable, used as an accent mark<sup>(1)</sup> (e.g. /ʃə'hɪh/, /'sələm/).

h. ~ is used, besides being a symbol for vocalic nasalization (e.g. [mĩ:m]), to separate two monemes or two phonetic realizations or phonemes that are in free variation with each other (e.g. /gas/~ /ǵas/ both meaning 'he touched', [e:]~ [eə], and /g/ ~ /k/, respectively).

#### 7.4 Basic Sound Differences between CA and SIA

It is a matter of fact that Arabic has undergone a certain degree of influence - now fortunately decreasing - by foreign languages such as Persian, Turkish, Kurdish and English. This

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(1) Since 'prosody' is not dealt with in any detail in this thesis, it is necessary to give, at this juncture, a brief account of 'accent' with reference to SIA. Accent is to be taken in the sense in which Martinet uses it (see his Elements..., pp.81ff). Martinet conceives of 'accent' as "the prominence given to a syllable and only one syllable within what, in the given language, constitutes the accentual unit" (p.81). In SIA, the phonic features characterizing accentual prominence are: articulatory energy, melodic pitch and the perceived duration of the accented syllable. An accent in SIA (as in all languages or dialects) fulfils a contrastive function as it only "contributes to the individualization of the word or the unit which is characterized in contrast with the other units of the same type represented in the same utterance" (p.83), for example /ʔə'kið/ 'sure' and /'rɪǵəs/ 'he returned'. It is also important to note that SIA has a 'free accent' (see Martinet's La description phonologique...cit, pp.45f, where the term 'accent libre', i.e. 'free accent' is used). In other words, the place of an accent in SIA is variable, i.e. it is not fixed to the same syllable in all SIA words. For example, some words have their accent on the first syllable (e.g. /'hələd/ 'country') and others on the second syllable (e.g. /ʔə'sɪd/ 'I repeat'). For Trubetzkoy's views on 'free accent', see his Principles..., pp.188ff. However, I am not in favour of attempting to formulate any rules as to where to place an accent in SIA words of different syllable structures since there are plenty of examples where it does not cause any confusion on the part of the listener wherever the accent is placed (e.g. /'mædrəsə/ 'school' is, to most SIA speakers, as intelligible as /mæd'rəsə/ 'same meaning').

thesis accounts for those loan words that are still frequently used by native speakers of SIA since they constitute an integral part of the speech of the average Iraqi speaker of Arabic. Since this thesis constitutes a synchronic phonematic study of the SIA word, the provenance of phonemes need not be accounted for.<sup>(1)</sup>

The basic sound differences between CA and SIA can be summarized as follows:

(a) Although a large number of Classical Arabic words are retained in SIA, in most examples of Classicism the diphthongs [əj] and [əw] have increasingly been disappearing from SIA or rather, replaced by monophthongs, viz. [e:] and [o:], respectively, which may, in the speech of most SIA speakers, be used in free variation with other diphthongs, viz. [eə] and [œ], respectively.

(b) The Classical Arabic sound [ḍ] does not, as we have seen, exist in the sound system of SIA; it is instead replaced by the sound [ð].

(c) The sound system of SIA includes three consonant sounds, viz. [p], [tʃ] and [g], which do not exist in CA. In the speech of most SIA speakers, [p], [tʃ] and [g] may be used in free variation with [b], [k], and [dʒ] and [ḳ], respectively, which are also found in the sound system of CA.

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(1) See A. Martinet, La description phonologique... cit, p.52, where it is stated that "il va sans dire que, dans la présente étude qui est synchronique, l'origine des phonèmes ne nous intéresse pas". The present synchronic study of SIA calls for a diachronic one in future.

### 7.5. A Brief Critical Account of Previous Analyses of SIA.

Iraqi Arabic in general and the Baghdadi dialect in particular, have not as yet received the linguistic attention they deserve. There are two linguistic studies of Iraqi Arabic which are worth mentioning: <sup>(1)</sup> (a) W.M. Erwin's phonemic, morphological, syntactical study of 1963, <sup>(2)</sup> and (b) H. Blanc's 1964 comparative study of three distinct dialects which are said to co-exist in Baghdad. <sup>(3)</sup> In addition, there is van Wagoner's elementary course in Spoken Iraqi Arabic which appeared in 1949. <sup>(4)</sup> To the best of my knowledge, however, no functional analysis of Iraqi Arabic has been made yet, which is why studies such as the present one are very important to conduct.

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(1) In addition to the two works to be mentioned, three valuable studies have appeared: (a) S.H. Al-Ani, Arabic Phonology: An Acoustical and Physiological Investigation (= Janua Linguarum, series practica 61), The Hague: Mouton & Co., 1970, (b) E.Y. Odisho, The Role of the Rear Section of the Vocal Tract in Baghdadi Arabic (unpublished M.Phil. thesis), University of Leeds, 1973, and (c) G.B. Ghalib, The Intonation of Colloquial Iraqi Spoken Arabic (unpublished M. Phil. thesis), University of Leeds, 1977.

(2) See W.M. Erwin, A Short Reference Grammar of Iraqi Arabic, - Washington, D.C.: Georgetown University Press, 1963. Though the title includes 'Iraqi Arabic', the study mainly describes Baghdadi Arabic.

(3) See H. Blanc, Communal Dialects in Baghdad (Cambridge: Harvard University Press, 1964) and W. Cowan's review of it in Language, 42, 1966, pp.694-699. L. Massignon, too, mentions the variations within Baghdadi Arabic which are related to different districts of Baghdad; see his "Notes sur le dialecte arabe de Bagdad" of 1912. (Arabic translation by A. Fadhil, published by the Iraqi Ministry of Information, 1962). These variations have, in my opinion, almost completely disappeared.

(4) See M.Y. van Wagoner, Spoken Iraqi Arabic (published by the Linguistic Society of America, 1949) and J. Cantineau's review of it in BSL, 49/2, 1953, pp.148-150.

Previous analyses of SIA have arrived at basically the same inventory of phonemes. The consonant and vowel charts contained in previous studies of SIA were based on phonetic descriptions of the so-called 'principal allophones' of corresponding phonemes. From a functionalist's point of view, these consonant and vowel charts can neither be considered as 'phonetic' nor as 'phonemic'. Let us examine, for example, the consonant and vowel charts contained in Erwin's analysis.<sup>(1)</sup> In the consonant chart, we only find one symbol for the nasal n. This may suggest that the cited symbol is a phonemic one because if it was meant to be a phonetic one (which is suggested by Erwin's label 'dental'), we would expect to find more symbols in the chart to account for the 'alveolar', the 'velar' and the 'uvular' realizations of the nasal phoneme /n/. But this cannot be the case since, as I have mentioned earlier, Erwin's consonant chart contains the symbol n only. On the other hand, labelling the nasal n as dental may suggest that it is a phonetic symbol (i.e. [n̥]) since the feature dental does not characterize (or is not possessed by) all the realizations of the respective nasal phoneme. In my view, therefore, Erwin only accounts for the 'principal allophone' of the nasal phoneme /n/ in his consonant chart.

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(1) See W.M. Erwin, op.cit., pp.3f. I disagree with Erwin's analysis from the start for reasons related to the principal differences between Erwin's approach (which is non-functionalist) and my approach (which is functionalist). These differences will become clear in the following chapters which deal with the actual functionalist analysis of SIA. Meanwhile, this critical account of Erwin's analysis of SIA is by no means exhaustive; it is only meant to prepare the reader for my analysis which is completely different from Erwin's analysis.

As regards the part of Erwin's consonant chart that deals with what he calls the 'emphatics', it is, in my opinion, purely phonetic as it includes  $p̣, ḅ, f̣, ẓ$ <sup>(1)</sup> which are, according to my functional analysis, combinatory variants of the corresponding 'plain' (i.e. non-emphatic) consonant phonemes, viz. /p, b, f, z/, respectively. I say they are 'combinatory variants' because there is no opposition between [p̣] (similarly [ḅ, f̣, ẓ]) and [p] (similarly [b, f, z]).

Erwin's vowel chart, on the other hand, is more like a phonemic chart than a phonetic one. For example, the vowel a is labelled as central regardless of the 'back' realization [ɑ:]. Similarly, the vowel ə is also labelled as central regardless of its 'retracted' realization [ʌ]. Strictly speaking, however, Erwin's vowel chart cannot be considered a hundred per cent phonemic since the table central does not correspond to a relevant feature of the corresponding vowel phonemes, i.e. /a/ and /ə/; the feature 'central' is not possessed by all the realizations of /a/ (and similarly /ə/).

Other previous analyses of SIA have disadvantages similar to those of Erwin's analysis. To give a clearer picture of a non-functional analysis of SIA, I present Erwin's consonant

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(1) Here and throughout this section, I have, for simplicity's sake, replaced Erwin's notation by my own notation. In addition, I do not, in my analysis of SIA, acknowledge the existence of the sound [ẓ] in SIA.

and vowel charts:

CONSONANTS

		Bilabial	Labiodental	Interdental	Dental	Palatal	Velar	Postvelar	Pharyngeal	Glottal
Stops	voiceless	p			t		k	ɰ		ʔ
	voiced	b			d		g			
Spirants	voiceless		f	θ	s	ʃ	x		ħ	h
	voiced			ð	z		ɣ		ʕ	
Affricates	voiceless					tʃ				
	voiced					dʒ				
Nasals		m			n					
Semi-vowels		w				j				
Lateral					l					
Flap					ɾ					
EMPHATIC	Stops	voiceless	p			t				
		voiced	b							
	Spirants	voiceless				s				
		voiced		f	ð	z				
	Nasal		m							
Lateral					l					

## VOWELS

Short	Front	Central	Back
High	ɪ		ʊ
Mid			ɔ
Low		ə	
Long			
High	i:		u:
Mid	e:		o:
Low		a:	



## Chapter Eight

PROBLEMS IN SIA PHONOLOGY8.1. The Phenomenon of 'Təfxim'.

The phenomenon of 'təfxim' (as called by the old Arab grammarians) or 'emphasis'<sup>(1)</sup> (as called by European and American scholars) plays an integral role in the phonetics and phonology of Arabic in general and SIA in particular. The term 'təfxim' and its derivatives<sup>(2)</sup> have in recent years been utilized by Arab as well as non-Arab linguists.<sup>(3)</sup> Furthermore, the phenomenon of 'təfxim' has also been referred to by European and American linguists as (emphatic) velarization, uvularization, pharyng(e)alization, retraction, strong articulation, u-resonance or even heaviness.<sup>(4)</sup> These concepts differ in two respects: (a) the

(1) The reader is reminded that the phenomenon of 'emphasis' has been mentioned briefly in section 6.4 (p.131) of this thesis.

(2) Like 'emphasis', 'təfxim' is a noun form. The former noun form has only one adjectival form, viz. 'emphatic', whereas 'təfxim' has two adjectival forms: 'mufəxxəm' (to qualify a singular noun, e.g. a mufəxxəm consonant) and 'mufəxxəmə' (to qualify a plural noun, e.g. mufəxxəmə consonants). However, the form 'emphatic' can, in linguistic terminology, also be used as a noun form (usually in the plural form), i.e. 'emphatics'.

(3) See for example (a) E.Y. Odisho, op.cit., (b) R. Jakobson, "'Mufaxxama': The 'Emphatic' Phonemes in Arabic", SW, 1, pp.510-522 (reprinted in Al-Ani (ed.), RAL, pp.269-281), and (c) J.Cantineau, op.cit., esp.pp.23f.

(4) See W. Lehn, "Emphasis in Cairo Arabic", Language, 39/1, pp. 29-39 (esp. footnote 1 on p.29); reprinted in Al-Ani's RAL, pp. 305-319. In this thesis, however, the term 'təfxim' is adopted in view of its importance in Arabic linguistic terminology.

specification of the phonetic features (articulatory and/or auditory) that characterize the resultant sounds,<sup>(1)</sup> and consequently (b) the specification of the sounds that are characterized as being 'emphatic' (or 'velarized, etc.).<sup>(2)</sup>

## 8.2. Previous Views on 'Ṭəfxim'.

Many linguists have previously expressed their views on the phenomenon of 'ṭəfxim'. Of these previous views on 'ṭəfxim', I shall deal with the views of N.S. Trubetzkoy (a Praguian), J. Cantineau (a functionalist Arabist) and E.Y. Odisho (an Iraqi experimental phonetician).

## 8.3. Trubetzkoy's Views

In his Principles...(pp.131f), N.S. Trubetzkoy uses the term 'emphatic velarization' to refer to what is in this thesis called 'ṭəfxim', and relates it mainly to Arabic. He also employs the term 'emphatic (velarized) consonants' for my term 'ṡəfəxxəmə consonants'. This is what Trubetzkoy has to say in this connexion:

(1) The phonetic features of Arabic which European and American scholars would designate as 'emphasis' have been identified by the old Arab grammarians as (a) 'ʔitbak' (i.e. spreading and raising of the tongue), (b) 'ʔistislaʔ' (i.e. elevation of the dorsum) and (c) 'ṭəfxim' (i.e. thickness or heaviness). For details, see Cantineau, op.cit., pp.23f, and W. Lehn, op.cit., p.29. In this thesis, however, the term 'ṭəfxim' accounts for all the above phenomena at once.

(2) On this matter see (a) R. Jakobson, op.cit., esp.p.510, (b) W. Lehn, op.cit., esp.pp.29-31, (c) E.Y. Odisho, op.cit., pp.1-86, (d) J. Cantineau, op.cit., p.15, and (e) N.S. Trubetzkoy, Principles..., p.131. For a critical account of various works on 'ṭəfxim' (or 'emphasis') and valuable contributions see Odisho, ibid and Lehn, ibid, pp.29-39.

"...it is necessary to distinguish the correlation of emphatic velarization that plays an important role in the Semitic languages, especially Arabic. The Arabic "emphatic" consonants are characterized by a thickening of the root of the tongue, which at the same time causes a shift of the larynx. The opposition between "emphatic" and "nonemphatic" consonants is found in the apical, guttural, sibilant, and laryngeal series.<sup>(1)</sup> It is accompanied in all series by specific shifts in the position of articulation: the "emphatic" apicals are not only velarized..., but are also alveolar in contrast with [i.e. in opposition to, A.R.] the post-dental nonemphatic apicals... However, these concomitant differences in the position of articulation must be ignored. For in the phonemic system of Arabic the emphatic velarized consonants form a closed category, which is placed in opposition to the category of the non-emphatic consonants. What makes the correlation of emphatic velarization in Arabic somewhat opaque is the fact that it does not comprise all consonants of the respective series, and

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(1) According to Trubetzkoy's analysis of phonological classes of distinctive oppositions, the 'laryngeal series' includes a purely laryngeal (i.e. glottal) series (e.g. SIA /h/ and /ʔ/) and a pharyngeal series (e.g. SIA /ħ/ and /ʕ/).

further that it cannot be neutralized."<sup>(1)</sup>

#### 8.4. Cantineau's Views.

J. Cantineau has written much about the linguistics of classical as well as dialectal Arabic. His Études de linguistique arabe contains a good number of his most important works on Arabic linguistics. According to Cantineau, 'təfxim'<sup>(2)</sup> involves two characteristics: (a) "une forte tension des différents organes de la phonation" (p.15), and (b) "un certain report en arrière du point d'articulation..." (ibid).

#### 8.5. Odisho's Views.

In his M.Phil. thesis (op.cit), E.Y. Odisho presents the most successful recent phonetic (physiological and acoustic) treatment of 'təfxim'. Odisho rightly thinks that none of the above notions (i.e. emphasis, velarization, etc.) accounts for all that is involved in the phenomenon of 'təfxim'. First of all, he points out that 'təfxim' is achieved by means of "subjecting some of the sounds, principally the denti-alveolars [i.e. the apicals, A.R.] produced in the front section [of the vocal tract, A.R.], to certain articulatory manoeuvres which are capable of yielding other sounds that can function as independent

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(1) Most, but not all, of this long quotation applies to SIA as we shall see in section 8.6 of this thesis. Martinet (a neo-Praguian) conceives of the "ṡufəxxəmə" consonants of Arabic as "une série de consonnes velarisées ou pharyngalisées, dites 'emphatiques'" (La description phonologique..., p.30).

(2) Cantineau would presumably employ the term 'emphasis' as he uses the term 'consonnes emphatiques' (i.e. emphatic consonants') instead of what I call 'ṡufəxxəmə consonants'; see Cantineau, op.cit, p.15.

phonological entities [i.e. separate phonemes, A.R.]" (p.11). Subsequently, Odisho amplifies this statement by saying that 'təfxim' is achieved by "a complex of articulatory movements leading to a rapidly shifting and complicated configuration of the vocal tract beginning from a slightly raised larynx and ending with slightly rounded and protruded shape of the lips" (p.37). Odisho (pp.37ff) goes on to discuss the phonetic features characterizing the phenomenon of 'təfxim'. These features, most of which I agree with, may be summarized as follows:

- (a) slight raising of the larynx,<sup>(1)</sup>
- (b) considerable pharyngeal constriction,
- (c) lip protrusion and/or lip rounding (protrusion is said to be more noticeable than rounding),<sup>(2)</sup>
- (d) slight retraction of the place of primary articulation (especially with [t̤] and [s̤]),<sup>(3)</sup>

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(1) Odisho does not go into the details of the movement of the larynx. Instead, he refers the reader to R.M.S. Heffner's General Phonetics, The University of Wisconsin Press, 1949, p.25.

(2) I agree with Odisho in that a slight degree of lip rounding and/or lip protrusion (among other phonetic features) accompany the production of the 'mufəxxəm' consonants of Baghdadi Arabic.

(3) According to Odisho's theory of 'təfxim', a slight retraction of the place of 'primary' articulation is acceptable as long as "almost the same place of primary articulation [of the 'non-mufəxxəm' counterpart, A.R.] is retained" (Odisho, op.cit., p.11). In other words, "any other articulatory manoeuvres which result in changing the place of articulation from one zone to another [e.g. from 'apical' to 'dorsal', A.R.] are excluded from tafxiim" (ibid).

- (e) tighter contact between the articulators<sup>(1)</sup> involved in the production of 'mufəxxəmə' consonants,
- (f) flattening and concavity of the mass of the tongue (especially before and during the release of occlusion for 'mufəxxəmə' stops),
- (g) backward retraction of the mass of the tongue, and finally
- (h) slightly greater lowering of the jaw which is a correlation of the sudden release of the closure and forceful depression of the tongue.

} the two together result in enlarging the oral cavity.

#### 8.6. My Views on 'Təfxim' and its Phonological Status.

The previous views on the phenomenon of 'təfxim' summarized above, have some similarities. I am in general agreement with these views but, as I have indicated before, I am more in agreement with Odisho's views than anybody else's because Odisho's views express more specifically the articulatory manoeuvres accompanying the production of 'mufəxxəmə' consonants.<sup>(2)</sup> I must admit, however, that it is not always possible to define the phonetic features characterizing 'təfxim'. I generally conceive of 'təfxim' as the simultaneous occurrence of a complex of certain phonetic (physiological and acoustic) features<sup>(3)</sup> which affects many, if not all, of the consonants of the Semitic languages in general and Arabic (both classical and dialectal) in

(1) These articulators are, according to Odisho, tip/blade of the tongue and denti-alveolar zone. Therefore, the consonants [t, ð, s, l] can have 'mufəxxəmə' counterparts, i.e. [t, ð, s, l], respectively. He also includes [m, b], hence [m, b], respectively.

(2) In my opinion, however, other consonants than those Odisho mentions can have 'mufəxxəmə' counterparts; the non-'mufəxxəmə' consonants [f, r, k, h, ʕ, ʔ, h] have the 'mufəxxəmə' counterparts [f, r, k, h, ʕ, ʔ, h] respectively.

(3) I.e. all the phonetic features mentioned by Odisho (see 8.5

particular.

Phonetically speaking, most of the Arabic consonants have their 'mufəxxəmə' counterparts, e.g. [b-ḅ, t-ṭ, ð-ð̣], etc. In SIA, in particular, the consonant sounds [p, b, f, m, t, ð, r, l, s, k, h, ʕ, ʔ, h] have the 'mufəxxəmə' counterparts [p̣, ḅ, f̣, ṃ, ṭ, ð̣, ṛ, ḷ, ṣ, ḳ, ḥ, ʕ̣, ʔ̣, ḥ], respectively. Phonologically speaking, on the other hand, when we resort to the commutation test for the determination of the phonological status of the SIA 'mufəxxəmə' consonants, we realize that some of them are realizations of the corresponding 'non-mufəxxəmə' consonant phonemes (e.g. [p̣] is nothing but a realization of /p/), while others are realizations of SIA "mufəxxəmə" consonant phonemes (e.g. [ṭ] is a realization of the "mufəxxəmə" phoneme /ṭ/). In other words, some of the SIA 'mufəxxəmə' consonants form minimal pairs with (i.e. they stand in distinctive opposition to) their respective 'non-mufəxxəmə' counterparts (e.g. /ṭin/ 'mud' - /tin/ 'figs'), whereas other SIA 'mufəxxəmə' consonants are never distinctively opposed to their respective 'non-mufəxxəmə' counterparts (e.g. [ˈp̣ɑːɾə] 'the smallest unit of Turkish money' is phonemically transcribed as /ˈp̣ɑːɾə/ but never \* /ˈpaɾa/).

To the first group belong the SIA 'mufəxxəmə' consonants [ṃ, ṭ, ð̣, ḷ, ṣ, ḳ] which are phonemically transcribed as /ṃ, ṭ, ð̣, ḷ, ṣ, ḳ/, respectively. The second group, on the other hand, includes the

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contd. from previous page:- above) as well as the features mentioned in footnote 1 on p.188. of this thesis.

SIA 'mufəxxəmə' consonants [p, b, f, r, h, ɾ, ʔ, h] which are phonemically transcribed as /p, b, f, r, h, ɾ, ʔ, h/, respectively.

From what I have said above, it is obvious that "mufəxxəmə" is a relevant feature which characterizes the SIA consonant phonemes /m, t, ð, l, ʃ, k/, and its absence (i.e. "non-mufəxxəmə") characterizes the consonant phonemes /m; t, d; θ, ð; l; s, z; k, g, x, γ/, respectively.<sup>(1)</sup> To prove the validity of my above conclusion, I quote the following minimal pairs<sup>(2)</sup> which are based solely on the "mufəxxəmə"/"non-mufəxxəmə" opposition:

- (a) m/m as in /məi/ 'water' - /məi/ 'name of a girl'.
- (b) t/t, d as in /hət/ 'he put' - /hət/ 'even, and', /həd/ 'limit',
- (c) ð/ð, θ as in /ðar/ 'it or he got lost' - /ðar/ 'he broadcast', /ðar/ 'harmful' - /θar/ 'revenge'.
- (d) l/l as in /'xalɪ/ 'my maternal uncle' - /'xalɪ/ 'empty'.
- (e) ʃ/s, z as in /ʃar/ 'it or he became' - /sar/ 'he walked', /zar/ 'he visited'.
- (f) k/k, g, x, γ as in /kas/ 'he measured' - /kas/ 'cup', /gas/ 'he touched', /kəs/ 'he narrated a story' - /xəs/ 'he specified', /γəs/ 'he choked'.

As regards the relation between the 'mufəxxəmə' consonants and the other consonants and vowels within the same moneme, I have

(1) Phonologically speaking, /t/ stands in opposition to both /t/ and /d/ by virtue of the relevant features "mufəxxəmə" vs. "non-mufəxxəmə" alone since the opposition between the relevant features "voiced"/"voiceless" (possessed by /d/ and /t/, respectively) is irrelevant to /t/ (i.e. when /t/ is opposed to /t/ or /d/, the feature of voicing is irrelevant). Similarly, /ð/ is in opposition to /θ/ and /ð/; /ʃ/ to /s/ and /z/; and /k/ to /k/, /g/, /x/ and /γ/.

(2) See chapters 9 and 10 for more examples.



been reassured, through careful examination of the examples contained in my corpus, that it is in most cases the 'muḫəxxəmə' consonants that affect vowel quality and the other phonetically 'non-muḫəxxəmə' consonants within the same moneme.<sup>(1)</sup> In addition, I have observed that this influence can be either progressive or regressive. For example, /a/ is realized as [ɑ:] in a word like /ʂan/ because it is preceded by the "muḫəxxəmə" phoneme /ʂ/ and so the influence is progressive, hence [ʂɑ:n]. On the other hand, in a word like /bət/ the vowel phoneme /ə/ is realized as [ʌ] and the consonant phoneme /b/ is realized as [b] because the "muḫəxxəmə" phoneme /t/ occurs in the same moneme and the influence is regressive because of the influence that /t/ has over the sounds before it, hence [bʌt:].

#### 8.7. The Phenomenon of 'Taʃdid'.

The phenomenon of 'taʃdid' (as it was called by the old Arab

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(1) As far as 'vowel quality' is concerned, my observation receives support from Trubetzkoy in his Principles..., p.105. We read:

"In Arabic a clear opposition based on degree of aperture exists between "i" and "a" [i.e. /i/ and /a/, respectively, in my notation, A.R.] since "a" is mostly realized as a front vowel (unless it occurs in the vicinity of "emphatic consonants"). But after emphatic consonants the "a" sounds "dark", so that in that position it rather stands in opposition to "u" [i.e. /u/ in my notation, A.R.] with respect to degree of aperture. Arabic "a" before "emphatic consonants" is realized as a back or back-central vowel (like the "a" in English "father")."

On this matter, see also (a) W.H.T. Gairdner, The Phonetics of Arabic, Oxford, 1925, especially chapters VI (The Vowels Described) and VII (Influence of Consonants on Vowels), (b) W.M. Erwin, op.cit., pp.12ff, and (c) J. Cantineau, op.cit., p.147.

grammarians) or 'gemination'<sup>(1)</sup> (as it is generally called by European and American scholars) is, like the phenomenon of 'təfxim', of prime importance in the phonology and phonetics of Arabic (whether it be classical or dialectal). The term 'təfɔid' and its derivatives<sup>(2)</sup> have rarely been used by non-Arab linguists.<sup>(3)</sup> The concept of 'gemination', on the one hand, mostly refers to the 'doubling of consonants'. On the other hand, the term 'təfɔid' literally means 'reinforcement' while in Arabic linguistic terminology it means more or less the same as 'gemination'.<sup>(4)</sup>

(1) The reader is reminded that the phenomenon of 'gemination' has been mentioned briefly in section 6.4 (p.132) of this thesis.

(2) Both 'gemination' and 'təfɔid' are nouns. The former is related to 'geminatē' (see for example T.M. Johnstone, Eastern Arabian Dialect Studies, London, 1967, p.26) or 'geminat' (see for example N.S. Trubetzkoy, Principles..., pp.161ff); hence 'geminat(d) consonants'. 'Təfɔid', on the other hand, is related to 'mufəddəd' which qualifies a singular noun (hence 'a mufəddəd consonant') and 'mufəddəd' which qualifies a plural noun (hence 'mufəddəd consonants'). However, the form 'geminat' can also be used as a noun (usually in the plural), e.g. we can talk about the 'geminates' of a given language (see for example N.S. Trubetzkoy, Principles..., p. 162). Some scholars would also use 'double(d)' instead of 'geminat(d)'; see W.M. Erwin, op.cit. p.27.

(3) The term 'təfɔid' has mainly been used by J. Cantineau in his French publications on Arabic linguistics; see his Études... cit (esp. p.25). However, the term 'təfɔid' and its derivatives are adopted in this thesis in view of their paramount importance in Arabic in general and SIA in particular.

(4) According to Elias' Modern Dictionary: English-Arabic (11th revised edition, Cairo: Elias Modern Press, 1959, p.296), the word 'geminat' means 'twin or identical; double(d) or paired, etc.' (my translation).

The 'mʊfəddədə consonants' (or the 'geminate') are known by some linguists as 'long consonants'.<sup>(1)</sup> In addition, some scholars would even call them 'geminate clusters'.<sup>(2)</sup>

#### 8.8. Previous Views on 'təfɔid'.

Like the phenomenon of 'təfɔim', the phenomenon of 'təfɔid' has been dealt with by many scholars. In the following few sections, I shall present the views of N.S. Trubetzkoy, A. Martinet, J. Cantineau, and W.M. Erwin.

#### 8.9. Trubetzkoy's Views.

In his treatment of 'təfɔid' and 'mʊfəddədə consonants' (i.e. 'gemination' and 'geminate' or 'geminated consonants' in Trubetzkoy's terminology), Trubetzkoy (Principles..., pp.161ff)

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\* 1937  
 (1) See for example (a) M. Swadesh, "The Phonemic Interpretation of Long Consonants," Language, 13,\*pp.1ff, and (b) T.F. Mitchell, "Long Consonants in Phonology and Phonetics", in SLA (a special volume of the Philological Society), 1957, pp.182-205. Such scholars would, in their transcriptions, treat 'long consonants' and 'long vowels' similarly. For example, Mitchell (op.cit, esp. p.182) transcribes both 'long consonants' and 'long vowels' with a length mark (: ) placed after the respective consonant or vowel symbol. In my opinion, this device can only be made use of in allophonic transcriptions of a language where 'consonant length' (or 'vowel length' as the case may be) is non-distinctive. In phonemic transcriptions, on the other hand, consonant or vowel length is shown only when it is phonologically distinctive; my convention of indicating distinctive 'length' is to double the respective consonant (or vowel) phonemic symbol. In SIA, for example, 'consonant length' (i.e. 'təfɔid') is distinctive except pre-pausally (see section 8.13) and 'vowel length' is always non-distinctive (see section 8.16); hence [na:r] 'fire(n.)' phonemically /nar/ and [həd'da:d] 'blacksmith' (phonemically /həd'dad/).

(2) See T.F. Mitchell, op.cit, p.189.

states the following:

"...many languages have so-called geminated consonants. These are distinguished from "simple" or "nongeminated" consonants by a longer duration, and in most cases also by a more energetic articulation that is reminiscent of the correlation of intensity.<sup>(1)</sup> In intervocalic position geminated consonants are distributed over two syllables, their "on-glide" being grouped with the preceding syllable, their "off-glide" with the following syllable. They have the same effect on their environment as consonant clusters and are generally treated in the same way as combinations of consonants. All these features point to a polyphonematic interpretation, that is, they call for an interpretation of "geminated" consonants (or "geminates") as a combination of two identical consonants."

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(1) Concerning the relationship between the 'correlation of gemination' and the 'correlation of intensity', Trubetzkoy writes:

"The marked members of the correlation of intensity are very often longer than the unmarked members. ...Thus there is a great similarity between the correlation of intensity and the correlation of gemination. The difference between the two correlations lies mainly in the fact that geminated consonants occur only in those positions where consonantal clusters are also permitted in the particular language, while "heavy" consonants (that is, the marked members of the correlation of intensity) do not occur only in those positions." [Principles...; p. 163]

### 8.10. Martinet's Views.

In his La description phonologique..., Martinet seems to share Trubetzkoy's views on 'təʃɑid' (see section 8.9 above). In addition, Martinet talks about consonant as well as vowel 'duration' (i.e. length). We read (pp.32f):

"Là où l'énergie est, pour ainsi dire, étalée dans le temps on trouve des articulations de durée supérieure à la moyenne et qui se distinguent ainsi d'articulations identiques de durée normale. Ceci peut se produire aussi bien pour les consonnes que pour les voyelles. La plus grande durée se marque soit par une barre horizontale placée au-dessus de la lettre ([ā],[r̄]), soit au moyen d'un point surélevé, de deux, ou de plus de deux points placés après la lettre ([a·],[r·],[a:], etc.). Lorsque'une consonne de longue durée se trouve entre deux voyelles, il est fréquent que le début en soit perçu comme la fin de la première syllabe, et la fin comme le début de la seconde, ce que donne l'impression de deux articulations successives. Les consonnes de ce type ont reçu le nom de géménées. Elles se notent, en général, au moyen de la même lettre redoublée: [appa]."

Moreover, Martinet (p.56) makes the point that 'təʃɑid' can be just a realization of simple consonants in certain phonetic contexts. He writes:

"...dans le patois d'Hauteville, après toute

voyelle accentuée brève, le phonème /p/ se réalise comme une géminée ou une longue, selon les sujets ou selon la netteté de l'articulation; exemples: /'pǎpǎ/ "papa, pape" prononcé ['pap-pa], avec une géminée, ou ['pa-ppa], avec une longue..."

### 8.11. Cantineau's Views

J. Cantineau (op.cit, p.14) discusses what he calls 'les consonnes géminées' which he describes as those consonants "dont l'articulation est prolongée de sorte que leur durée est à peu près égale a celle de deux consonnes simples" and that are generally transcribed by doubling the consonant symbol, i.e. bb, mm, etc. Furthermore, he talks about the difference between 'long consonants' and 'geminate'. In Cantineau's view, long consonants are long realizations of simple consonants, whereas geminate are "des groupes de deux consonnes identiques<sup>?</sup>" (ibid, p.143).

In connexion with CA, Cantineau (p.189) states that all consonants can be geminated and that "cette gémination a une fonction différenciative" as manifest in minimal pairs like CA /'kətələ/ 'he killed' - /'kəttələ/ 'he massacred a large number of people' and /ǧə'mal/ 'beauty' - /ǧəm'mal/ 'camel-driver'.<sup>(1)</sup> Cantineau generalizes, rightly in my view, that "toutefois il n'y a pas en arabe de corrélation de gémination: la géminée équivalent à deux consonnes simples identiques se suivant immédiate-

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(1) The examples cited are Cantineau's, but for simplicity's sake I have used my system of transcription (see sections 7.2 and 7.3 of this thesis).

ment" (ibid). Concerning the occurrence of 'gemination', Cantineau shares Trubetzkoy's view that gemination occurs in positions where "un groupe de deux consonnes serait admis" (ibid), and that when it occurs intervocalically the first of the two identical consonants ends one syllable and the second begins the following syllable. Moreover, Cantineau mentions the possibility that 'gemination' may be a result of assimilation. I quote:

"La réalisation phonétique de l'énoncé comporte notablement plus de consonnes géminées que la graphie arabe (quasi phonologique) des consonnes ne l'indique à première vue: c'est ainsi que le ī de l'article s'assimile aux interdentes, sifflantes, alvéolaires, liquides et à la prépalatale š ; c'est ainsi que dans le texte coranique il y a de nombreuses assimilations entre la consonne finale d'un mot et la consonne initiale du mot suivant. Ces assimilations et les géminées qui en résultent ont seulement pour effet de rendre identiques deux consonnes déjà plus ou moins apparentées; la seule fonction qu'on pourrait leur attribuer est d'indiquer qu'un élément significatif est étroitement lié à l'élément suivant, et qu'il n'est pas à la fin d'une phrase ou d'un membre de phrase: ces géminées seraient donc des "signes démarcatifs négatifs" - mais étant donnée l'abondance et la netteté des "signes démarcatifs positifs" cette fonction est de peu d'importance." [pp.189f]

### 8.12. Erwin's Views

W.M. Erwin views the phenomenon of 'təfdaid' as the doubling of consonants. This is what Erwin (op.cit., pp.27f) has to say in connexion with the 'double consonants' of SIA:

"Any Iraqi consonant may occur double....double consonant sounds...frequently occur within a single word. When a stop consonant...is doubled, the closure is maintained slightly longer before release than for the corresponding single consonant.<sup>(1)</sup>  
 ...When the spirant ç<sup>(2)</sup> [i.e. my [ç], A.R.]...is doubled, the sound is prolonged slightly longer than for a single ç... and is then released abruptly and with some aspiration. A double çç thus tends to sound somewhat like a prolonged ç followed by the

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(1) This 'prolongation' also applies to the SIA affricates [tʃ] and [dʒ] (i.e. [ttʃ] and [ddʒ]), fricatives (i.e. [ss], [ff], etc.), nasals (i.e. [mm], [nn], etc.), and the laterals (i.e. [ll] and [ʎʎ]).

(2) S.H. Al-Ani (see his article "An Acoustical and Physiological Investigation of the Arabic /ç/," in Actes du Dixième Congrès International des Linguistes, Vol.4, Bucharest, 1967, pp.155-160; reprinted in Al-Ani (ed.) RAL, Bloomington: Indiana University Linguistics Club, 1978, pp.89-101) concludes through experimental evidence that /ç/ is mostly realized as a 'voiceless stop' to be grouped together with /ʔ/ and not as a 'voiced fricative' which is usually grouped together with /h/. From a functional standpoint, however, this conclusion is not valid since /ç/ is, as Al-Ani (ibid) states, realized as a 'glide' in certain phonetic contexts, which proves that the feature 'stop' is phonologically irrelevant; the feature 'voiceless', too, is irrelevant. For my views on the relevant features of the SIA phoneme /ç/ which distinguish it from the other consonant phonemes of SIA, see section 10.29 of this thesis.



glottal stop ʔ.<sup>(1)</sup>

Thus Erwin conceives of 'təʃdɪd' as basically the prolongation of corresponding single consonants and he does not deal with it from a phonological point of view.

### 8.13 My Views on 'Təʃdɪd' and its Phonological Status.

Like 'təʃxɪm', 'təʃdɪd' is a very important phonetic phenomenon which has its phonological justification in certain word positions which may vary from one language (or dialect) to another. In Arabic in general and SIA in particular, 'təʃdɪd' is a more prominent phenomenon than it is in European languages, for example.<sup>(2)</sup> This phenomenon affects all the SIA consonants (whether they be 'mʊʃəxxəmə' or 'non-mʊʃəxxəmə').

From a phonetic (articulatory and auditory) point of view, 'təʃdɪd' in SIA is simply the lengthening of 'simple' consonants to yield 'mʊʃədɪdɪd' consonants. This 'lengthening' is realized differently with different SIA consonants. On the one hand, when 'stop' consonants (i.e. affricates and plosives) occur 'mʊʃədɪdɪd', the closure is maintained longer before the release stage of the

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(1) In addition, w and j, whether phonemes (as viewed by Erwin) or combinatory variants of /u/ and /i/, respectively (according to my analysis, see section 8.15) may be doubled (i.e. ww and jj, respectively).

(2) Very rarely in European languages does 'təʃdɪd' point to a poly-phonematic interpretation while there are numerous examples in SIA where it functions distinctively, i.e. it requires a poly-phonematic interpretation in SIA as we shall see later in this section.

corresponding 'single' stops. On the other hand, when 'fricatives' occur 'mʊfæddədə', the friction noise is prolonged slightly more than for the corresponding 'single' fricatives. What applies to stops and fricatives also applies to the nasals and the laterals. As regards the SIA alveolar vibrants [ɾ] and [ɽ], the tapping of the blade of the tongue is made to recur several times in the case of 'təʃdiid'.

I agree with the previous views on 'təʃdiid' (expressed above) in that it occurs where a consonant cluster is likely to occur.<sup>(1)</sup> This makes it necessary to determine the positions in which consonant clusters are permitted in SIA. Consonant clusters may occur word-initially, intervocalically (i.e. medially) and, less frequently, word-finally (i.e. pre-pausally)<sup>(2)</sup> in SIA, e.g. [snu:n] 'teeth', ['hæflə] 'party', and [ʃəɾk] 'east', respectively. Therefore, 'təʃdiid' in SIA is likely to occur initially, intervocalically, and finally.

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(1) The occurrence of consonant clusters always functions distinctively in SIA. In other words, it requires a polyphonematic interpretation, i.e. a consonant cluster is always regarded as a succession of two consonant phonemes. The phonological status of 'təʃdiid' in SIA, on the other hand, will be dealt with later in this section.

(2) For examples of consonant clusters in these positions, see W.M. Erwin, op.cit., pp.31ff. It is important to note that word-final consonant clusters mainly occur in CA words whose full form is retained in SIA, e.g. [ʃəɾk] 'east'. In all cases, however, word-final consonant clusters are always preceded by short vowels; many speakers of SIA would separate the two members of a word-final consonant cluster by a short vowel, e.g. ['ʃəɾɪk] instead of [ʃəɾk].

What is the phonological status of 'təʃdiid' in each of the three word positions in SIA? Firstly, in word-initial position, 'təʃdiid' functions distinctively as there are minimal pairs based on the distinction between 'təʃdiid' and 'non-təʃdiid'. In other words, one of the respective identical consonants (usually the first) is commutable with the other SIA phonemes or with phonological 'zero'. Therefore, word-initial 'təʃdiid' requires a polyphonematic interpretation. For example, the SIA word [tta:'ri:x] 'the date; the history' is phonemically transcribed as /tta'rix/ because it stands in opposition to [wta:'ri:x] 'and date; and history' (phonemically /uta'rix/) and [ta:'ri:x] 'date; history' (phonemically /ta'rix/). In most cases, the first of the respective identical consonants is a prefix (viz. the definite article or a preposition) which assimilates to (or happens to be identical with) the initial consonant of the respective unprefixated word. For example, the first [t] in the above example [tta:'ri:x] stands for the definite article, and the first [l] in the SIA word [lləiθ] 'to Laith (name of a boy)' stands for a preposition ('to' in this case). In a very few cases, word-initial 'təʃdiid' occurs not as a result of adding a prefix but as part of a non-prefixated word, as in the case of the SIA word [ttri'fa:k] 'agreement' wherein the first of the identical consonants can be opposed to other SIA consonants forming quasi-minimal pairs, e.g. /ttri'fa(k)/ 'see meaning above' vs. /htri'fa(l)/ 'celebration, festival' and /rttri'fa(ʔ)/ 'height', etc. A final remark about word-initial 'təʃdiid': only the SIA consonants [p,b,f,m,m̄,t,d,t̄,θ,ð,ð̄,s,z,s̄,

r, l, <sup>(1)</sup> [ʃ, tʃ, dʒ, n] can occur 'mʊʃədɪdə' in this position. <sup>(2)</sup>

Secondly, intervocalic 'təʃdɪd' always functions distinctively in SIA. There are, in SIA, plenty of minimal pairs that are solely based on the distinction between the presence and the absence of 'təʃdɪd' in intervocalic position. In most cases, one of the identical consonants is commutable with 'zero', e.g. ['sɛlləm] 'he taught' - ['sɛləm] 'flag'. Less frequently, one of the identical consonants is commutable with other SIA consonants, for example ['hɛllə] 'he sweetened' - ['hɛflə] 'party', ['hɛlgə] 'his mouth', and ['hɛlwə] 'sweets' in which case one of the [-l-] is commuted with [f], [g] and [w], respectively. Since intervocalic 'təʃdɪd' functions (in the above examples among others) distinctively in SIA, it requires a polyphonematic interpretation, i.e. ['sɛlləm] and ['hɛllə] should phonemically be transcribed as /'sɛlləm/ and /'hɛllə/, respectively. What is characteristic of intervocalic 'təʃdɪd' is that the two identical consonants split between two syllables: the first ending one and the second starting the following syllable, e.g. /'hɛl-lə/ and /'sɛl-ləm/. <sup>(3)</sup> In other words, intervocalic 'təʃdɪd' fulfils a demarcative function as it

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(1) The SIA consonant [ɹ] is not included here since it never occurs word-initially; see sections 12.21 and 13.4 of this thesis.

(2) This remark also applies to SIA [p, b, f, r] which are as we shall see in Chapter Nine, in combinatorial variance with [p, b, f, r], respectively. For examples see W.M. Erwin, *op.cit.*, pp.28f.

(3) This, among other characteristics of intervocalic 'təʃdɪd', also holds good for intervocalic consonant clusters in SIA, e.g. /'hɛf-lə/ 'party'.

points to the end of one and the beginning of the following syllable. A final remark about intervocalic təʃdaɪd in SIA: all consonants can occur 'mʊʃəddədə' in this position. (1)

Finally, the phonological status of word-final (or prepausal) 'təʃdaɪd' is, unlike that of word-initial and word-medial 'təʃdaɪd' not straightforward. To be more specific, word-final 'təʃdaɪd' is in most cases nothing but a phonetic (i.e. a non-distinctive) lengthening of SIA consonants. In other words, most cases of word-final 'təʃdaɪd' require a monophonematic interpretation; a length mark(:) appears only in an allophonic transcription to account for non-distinctive 'təʃdaɪd'. For example, a word like [ʔəd:] 'he counted' should phonemically be transcribed as /ʔəd/. In very rare cases, however, word-final 'təʃdaɪd' can function distinctively. This is so only in those SIA words where one of the respective identical consonants is commutable with other SIA consonants so as to produce words that belong to CA but which are retained in the speech of most educated speakers of SIA. (2) Such words would always be monosyllables with a short vowel. Examples:

[hɪlɪ] 'solve! (imp.)' as opposed to [hɪlɪf] 'alliance'.

[bʌɾɾ] 'land (n.)' as opposed to [bʌɾk] 'lightning'.

[ʃəɾɾ] 'evil(n.)' as opposed to [ʃəɾk] 'east'.

Since word-final 'təʃdaɪd' can function distinctively in SIA

(1) For examples, see W.M. Erwin, op.cit., pp.29f.

(2) See footnote (2) on p.204 of this thesis.

(as in the above examples), it requires a polyphonematic interpretation, hence /hɪll/, /bærr/ and /ʃærr/. In brief, word-final 'təʃdaɪd' affects most SIA consonants distinctively in very few cases and non-distinctively in most cases.<sup>(1)</sup>

To recapitulate, 'təʃdaɪd' in SIA is a phonetic phenomenon that may affect some or all consonants depending on the word position where it occurs. It may or may not function distinctively. Even when it is phonologically distinctive, 'təʃdaɪd' is, unlike 'təʃxim', not to be regarded as a "relevant feature" of individual phonemes; instead it is to be identified with a repetition of the respective phoneme. When 'təʃdaɪd' is phonologically distinctive, the symbol of the respective consonant is repeated in allophonic as well as in phonemic transcriptions. When 'təʃdaɪd' is phonologically non-distinctive, on the other hand, a length mark (: ) is placed after the respective consonant symbol in an allophonic transcription and is omitted in a phonemic transcription.

allophonic transcription	phonemic transcription	meaning
[ttɑ:'ri:x]	/tta'rix/	the date; the history
['ɛəlləm]	/'ɛəlləm/	he taught
[ʃærr]	/ʃærr/	evil (n.)
[ʃəd:]	/ʃəd/	he counted.

(1) For examples of word-final 'təʃdaɪd', see W.M. Erwin, op.cit., p.30.

#### 8.14. Affricates: One or Two Phonemes?

Affricates pose a phonological problem in SIA as to whether they should be interpreted monophonematically or polyphonematically. In other words, should the SIA affricates [tʃ], [dʒ], [tʃs] and [tʃʃ] be considered as realizations of two successive phonemes each (i.e. /t/ + /ʃ/, /d/ + /ʒ/, /tʃ/ + /s/, and /tʃ/ + /ʃ/, respectively) or as realizations of single phonemes (i.e. /tʃ/, /dʒ/, /tʃs/ and /tʃʃ/, respectively)? We cannot give a straightforward answer to this vital question because not all SIA affricates function phonologically in the same manner. The manner in which [tʃ] and [dʒ] function in the phonology of SIA is different from that in which [tʃs] and [tʃʃ] do. Therefore, I shall deal with the two groups of affricates separately.

On the one hand, the non-phonematic facts about SIA [tʃ] and [dʒ] are the following: (a) [tʃ] (as in [tʃaːj] 'tea') and [dʒ] (as in [dʒaːj] 'here') are, like other affricates, non-homogeneous phonic products, (b) they do not sound as a succession of two consonants (i.e. [t] + [ʃ] and [d] + [ʒ], respectively), (c) they have the duration of one sound each, and finally (d) SIA does not permit consonant clusters of three and so a word like [tʃʃuːx] 'wheels' cannot be thought of as having three initial consonants, i.e. [t] + [ʃ] + [ʃ]. The first of these facts might suggest that [tʃ] and [dʒ] should each be considered as a realization of two successive phonemes, viz. /t/ + /ʃ/ and /d/ + /ʒ/, respectively. Facts (b), (c) and (d), on the other hand, might suggest that [tʃ] and [dʒ] should be interpreted as

realizations of single phonemes, viz. /tʃ/ and /dʒ/, respectively. But the above factors are not linguistically decisive for the determination of the phonological status of sounds. What would be decisive from a functional point of view is the commutation test.<sup>(1)</sup>

In the phonological system of SIA, [tʃ] and [dʒ] form a pair, the former being the voiceless counterpart of the latter and so "the two ought to be treated alike",<sup>(2)</sup> i.e. [tʃ] and [dʒ] should have comparable phonological status in SIA. For example, let us consider [tʃ] in the SIA word [tʃe:ɪ] 'the act of measuring'. In SIA, [t] may occur without a following [ʃ], i.e. [te:ɪ] 'lamp post' and, conversely, [ʃ] may occur without a preceding [t], i.e. [ʃe:ɪ] 'the act of carrying'. Thus, each of the constituent elements of [tʃ] is commutable with zero. Consequently, we might be tempted to analyze the word [tʃe:ɪ] phonemically as /t/ + /ʃ/ + /e/ + /ɪ/, hence interpreting [tʃ] polyphonematically. But in the phonological system of SIA, [tʃ] is commutable with [dʒ] in minimal pairs (e.g. [tʃi:ɪ] 'measure!' vs. [dʒi:ɪ] 'generation', ['ɪɪdʒəm] 'he hit' vs. ['ɪɪdʒəm] 'he silenced', and [ɪa:tʃ] 'he chewed' vs. [ɪa:dʒ] 'he wandered in suspense'): [tʃ] being the voiceless counterpart of [dʒ], which is why [tʃ] and [dʒ] should be treated alike. Now the second element of [dʒ], i.e. [ʒ], never occurs in SIA in any

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(1) On the functional phonematic interpretation of [tʃ] and [dʒ] in general, see A. Martinet (a) Elements ..., pp. 74f, (b) La description phonologique ..., p. 43 and (c) "Un ou deux phonèmes?" in his La Linguistique synchronique ..., pp. 109-123. See also F. François, "La description linguistique", in A. Martinet (ed.), Le Langage; encyclopédie de la Pléiade ..., pp. 192 and 208f.

(2) A. Martinet, Elements ..., p. 74.



position without a preceding [d]. Therefore, a word like [dʒi:l] should phonologically be thought of as consisting of three phonemes, viz. /dʒ/ + /i/ + /l/. In other words, [dʒ] is to be considered as a realization of a single phoneme, i.e. /dʒ/, since only [ʒ] is commutable with zero,<sup>(1)</sup> e.g. [dʒa:s] 'he touched' vs. [da:s] 'he trod on'. As a result, [tʃ] in a word like [tʃe:l], for example, should phonemically be analyzed into three phonemes, viz. /tʃ/ + /e/ + /l/. In brief, SIA [tʃ] and [dʒ] are to be interpreted as realizations of single phonemes, viz. /tʃ/ and /dʒ/ (or rather /č/ and /ǰ/ <sup>(2)</sup>), respectively.

On the other hand, the phonological status of SIA [tʃs] (as in [ˈsəʃsə] 'a sneeze') and [tʃʃ] (as in [ˈsəʃʃə] 'an instance of feeling or being thirsty') is obvious since the constituent elements of each of these affricates split between two syllables when occurring intervocalically (as in the above examples); the first element ending one and the other starting the following syllable, i.e. [ˈsəʃ-sə] and [ˈsəʃ-ʃə]. Moreover, the constituent elements of these affricates are both commutable with zero, e.g. [ˈsəʃsə] 'see meaning above' vs. [ˈsəʃə] 'name of a boy' and [ˈsəsə] 'I hope that'; and [ˈsəʃʃə] 'see meaning above' vs. [ˈsəʃə] 'see meaning above' and [ˈsəʃə] 'dinner' - the second element in [tʃs] is also commutable with the second element in [tʃʃ], e.g. [ˈsəʃsə] 'see meaning above' vs. [ˈsəʃʃə] 'see meaning

(1) See A. Martinet, "un ou deux phonèmes?"... cit, p. 98, and A. Cohen, *The Phonemes of English*, The Hague, 1952, pp. 43f. See also Martinet's *Elements* ..., p. 74.

(2) As stated in section 7.2, the phonemic symbols /č/ and /ǰ/ are to be used instead of /tʃ/ and /dʒ/ due to the monophonemic status in the phonology of SIA and also because the latter set of symbols might give the wrong impression that they stand for two phonemes each.

above'. The fact that the constituent elements of [t̥s] and [t̥ʃ] split between two syllables intervocalically coupled with their commutability with zero prove the polyphonemic (i.e. biphonemic) status of [t̥s] and [t̥ʃ]. In other words, SIA [t̥s] and [t̥ʃ] are to be interpreted as realizations of two successive phonemes, viz. /t̥/ + /s/ and /t̥/ + /ʃ/, respectively; hence /'s̥ət̥sə/ 'see meaning above' and /'s̥ət̥ʃə/ 'see meaning above'.

To recapitulate, the SIA affricates function as follows: [t̥ʃ] and [dʒ] are realizations of single phonemes, i.e. /č/ and /ǰ/, respectively, whereas [t̥s] and [t̥ʃ] are realizations of two successive phonemes each, i.e. /t̥/ + /s/ and /t̥/ + /ʃ/, respectively.

#### 8.15 The Phonematic Relation of [i] and [j], and [u] and [w].

The phonetic and phonematic relation of the SIA sounds [i] and [j] is analogous to that of [u] and [w]. From the phonetic point of view, on the one hand, [j] and [w] are not pronounced as fricative sounds but rather as semivowels. That is to say, [i] and [j] (and analogously [u] and [w]) are closely related from an articulatory and acoustic standpoint. The basic difference between [i] and [j] (or, similarly, between [u] and [w]) is that their function within the syllable is different: while [i] (or, similarly, [u]) always functions as a syllable nucleus, [j] (or, similarly, [w]) never performs such a function.

As Vachek<sup>(1)</sup> rightly points out, "this kind of difference is, of course, of paramount importance for the prosodic system of language; from the phonological point of view, however, it is much less significant" (p. 246).

From the phonological point of view, Vachek strongly believes in what he calls the 'phonematic identification' of [i] and [j] (and analogously [u] and [w]) despite their different functions within the syllable "unless other arguments can be presented contradicting such identification" (*ibid*). The decisive factor for determining the phonematic relation of [i] and [j] (or [u] and [w]) is, in Vachek's opinion, "the complementary distribution of the members of such pairs in concrete contexts" (*ibid*).<sup>(2)</sup> Since SIA [i] and [j] (or [u] and [w]) are in complementary distribution, they are to be considered as combinatory variants of one and the same phoneme, i.e. [i] and [j] are to be considered as combinatory variants of /i/, and [u] and [w] as combinatory variants of /u/. The only argument that Vachek presents as being likely to contradict the phonematic identification of [i] and [j] (and, similarly, [u] and [w]) is "the incompatibility of such phonematic identification with the laws that govern the grouping of phonemes in that language" (p. 247), e.g. the absolute non-acceptability of what he calls

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(1) See J. Vachek, "The Phonematic Relation of Modern English [i] and [j]," in his Selected Writings in English and General Linguistics, Mouton, 1976, pp. 246-253.

(2) The contexts where [i] and [j] (and [u] and [w]) occur will be dealt with in sections 9.32 and 9.33, respectively.

'geminated phonemes' in any contexts (in this connexion he refers to sound combinations like [ij] and [ji] or, similarly, [uw] and [wu]).<sup>(1)</sup> However, this argument does not preclude the phonematic identification of SIA [i] and [j] (or, analogously, [u] and [w]) for the following reasons: (a) SIA does admit the occurrence of geminated phonemes, (b) the sound combinations [ij] and [ji] (or, similarly, [uw] and [wu]) never occur in SIA and (c) vowel-phoneme gemination is possible in SIA only in the case of doubling the occurrence of [j] (e.g. ['hɪjjə] 'she' - phonemically /'hɪiiə/) or [w] (e.g. ['hʊwwə] 'he' - phonemically /'hʊuuə/).

The phonematic identification of [i] and [j] (and, similarly, [u] and [w]) based on Vachek's views can be arrived at by means of applying one of Trubetzkoy's rules which reads as follows: "If two sounds of a given language, related acoustically or articulatorily, never occur in the same environment, they are to be considered combinatory variants of the same phoneme" (Principles ..., p. 49). According to this rule, SIA [i] and [j] and [u] and [w] are to be considered as combinatory variants of /i/ and /u/, respectively.

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(1) In the case of SIA, the laws governing the grouping of phonemes do not permit more than two successive occurrences of the same phoneme which is, partly, why [j] and [w] have been related to [i] and [u] and not to [ɪ] and [ʊ] - hence /'hɪiiə/ 'she' not\*/'hɪɪɪə/ and /'hʊuuə/ 'he' not\*/'hʊʊʊə/. The basic reason for relating [j] and [w] to [i] and [u], respectively is, in my view, that both [i] and [j] are distinctively "front" (as opposed to [u] and [w]) and of a "first-degree aperture" as opposed to [ɪ], [e], etc.), and both [u] and [w] are distinctively "back" (as opposed to [i] and [j]) and of a "first-degree aperture" (as opposed to [ʊ] and [o], etc.). In addition, both [i] and [j] are phonetically 'unrounded' and both [u] and [w] are phonetically 'rounded'.

Since Vachek's interpretation of this phonological problem is based on the complementary distribution of [i] and [j] (and, similarly, [u] and [w]) and Trubetzkoy's interpretation is based on the fact that the two sounds (i.e. [i] and [j], or [u] and [w]) "never occur in the same environment", the 'commutation test' proves to be the crucial factor for a phonematic interpretation of pairs of sounds like [i] and [j], and [u] and [w].<sup>(1)</sup> According to the commutation test, that is to say, [i] and [j] (or, similarly, [u] and [w]) should be regarded as combinatory variants of one and the same phoneme (viz. /i/, or, similarly, /u/), since there is no opposition between [i] and [j] (or [u] and [w]) and, furthermore, the members of such pairs of sounds are in complementary distribution, i.e. one of them occurs where the other never does.

Having come to the conclusion that [i] and [j] should be considered as combinatory variants of /i/, and [u] and [w] as combinatory variants of /u/, should we regard /i/ and /u/ as belonging to the consonant system of SIA or to the vowel system? In connexion with a language where [j] and [w] are regarded as independent phonemes, i.e. as /j/ and /w/, respectively, Martinet has this to say:

"Toutefois, lorsqu'on classe les phonèmes sur la base de leurs traits pertinents, on s'aperçoit que consonnes et voyelles forment généralement deux

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(1) For Martinet's phonematic interpretation of [i] and [j] in various languages, see La description phonologique ..., pp. 44f, 67ff. For his phonematic interpretation of [u] and [w] in Hauteville, see ibid, pp. 70f.

groupes distincts, encore que certains phonèmes puissent être à cheval et que, parfois, des consonnes comme /j/ et /w/ trouvent plus naturellement leur place dans le tableau des voyelles que dans celui des consonnes." [La description phonologique ..., p. 45]

In connexion with Standard English where [i] is regarded as a combinatory variant of /i/, and [u] as a combinatory variant of /u/, Vachek has this to say:

"The resulting phoneme, with its two allophones, one a vowel, another a consonant, has come to occupy a singular, remarkable place in the phonematic pattern [of English, A.R.]: it serves as a link of its two sub-systems, the vocalic and the consonantal one. At the same time, the i/j-phoneme has come to be, in a sense, a peripheral element of both those sub-systems, as it does not entirely belong to any of the two. Still, its fundamental allophone clearly belongs to the vocalic sub-system, because, being a "checked" vowel, it is linked in that sub-system to its "free" counterpart." [op. cit., p. 25]

My views on this question (in connexion with SIA, of course) are as follows. Since /i/ and /u/ have consonantal realizations, viz. [j] and [w], respectively, they are likely to be opposable to the SIA consonant phonemes, e.g. /iəm/ 'near' vs. /dəm/ 'blood', /ʃəm/ 'paternal uncle', etc., and /'uəddə/ 'he sent' vs. /'səddə/ 'he closed it', /'xəddə/ 'his cheek', etc. This also means that [j] and [w] are likely to occur 'ɱʊfəddədə', e.g. ['həjjə] 'snake' and ['həwwə] 'Eve'. When /i/ and /u/ are realized vocally (namely as [i:] and [u:], respectively),

they are likely to be opposable to the SIA vowel phonemes as well as to each other, e.g. /<sup>s</sup>id/ 'feast' vs. /<sup>s</sup>ad/ 'he returned', /<sup>s</sup>əd/ 'he counted', /<sup>s</sup>ud/ 'stick (n.)', etc. In other words, /i/ and /u/ are opposable to phonemes both in the consonant system of SIA as well as in the vowel system. But since the relevant features of /i/ are "front" and "first-degree aperture" (see above) and those of /u/ are "back" and "first-degree aperture" (see above), which are vocalic properties, /i/ and /u/ are to be included in the SIA vowel system in order to preserve the "front"/"back" correlation (i.e. the opposition between /i/ and /u/, respectively) and the "first-degree aperture"/"second-degree aperture", etc. correlation (i.e. the opposition between /i/ and /ɪ/, etc. and /u/ and /ʊ/, etc.). That is to say, /i/ and /u/ are to be considered as vowel phonemes in the SIA phonological system. Finally, since the vowel phonemes /i/ and /u/ can be realized consonantly, as pointed out above, word-initial opposition between them is to be regarded as the only possibility of its sort, e.g. /'iəddə/ 'handle (n.)' vs. /'uəddə/ 'he sent'. This also means that geminated vowel phonemes, too, are possible in SIA, e.g. /'hæiiə/ 'snake' (phonetically ['hæjjə] above), /'hæuuə/ 'Eve' (phonetically ['hæwwə] above).

#### 8.16 Is 'Vowel Length' Distinctive?

A conclusion as to whether a given vocalic feature is phonologically distinctive or non-distinctive in SIA can be reached through looking at the phonological oppositions existing between

the various vowels of the phonological system of SIA, i.e. through resorting to the commutation test. In this section, I shall investigate the phonological status (i.e. the distinctiveness or, as the case may be, the non-distinctiveness) of 'vowel length' in SIA. First of all, here is my inventory of the SIA vowel sounds (i.e. monophthongs). The SIA vowel sounds fall into two groups: (1) [i], [u], [e], [o], [a] and [ɑ], and (2) [ɪ], [ʊ], [ə] and [ʌ]. The vowels of the first group are phonetically longer (in duration) than the vowels of the second group and so the symbols of the vowels of the first group are usually accompanied by a length mark (:), i.e. [i:], [u:], [e:], [o:], [a:] and [ɑ:]. But is this phonetic 'length' difference between the vowels of group (1) and those of group (2) phonologically relevant? We cannot give a definite answer until we see what the commutation test shows.

In word-medial position, for example, the commutation test reveals the following facts about the SIA vowel sounds:

(a) There is no distinctive opposition between [ə] and [ʌ] and, furthermore, these two vowel sounds never occur in the same phonetic contexts and so they should be interpreted as combinatory variants of one and the same phoneme, i.e. /ə/ according to my notation.

(b) What I have said in (a) above in connexion with [ə] and [ʌ] holds true for [a:] and [ɑ:] and so the latter two vowel sounds should be interpreted as combinatory variants of one



and the same phoneme, i.e. /a/ according to my notation.

(c) There is a distinctive opposition between each pair of SIA vowels from [i:], [u:], [e:], [o:], [a:] (or similarly, [a:]), [ɪ], [ʊ], and [ə] (or, similarly, [ʌ] ) and so each of these vowels should be regarded as a realization of a separate phoneme, i.e. /i/, /u/, /e/, /o/, /a/, /ɪ/, /ʊ/, and /ə/ respectively. In other words, the SIA vowel system is composed of eight phonemes.

The vocalic properties (i.e. features) serving to distinguish between the SIA vowel phonemes are of two types: (1) properties based on degree of aperture, and (2) properties of localization<sup>(1)</sup>. All the SIA vowel phonemes have distinctive properties based on degree of aperture: "first-degree aperture" characterizes /i/ and /u/; "second-degree aperture" characterizes /ɪ/ and /ʊ/; "third-degree aperture" characterizes /ə/; "fourth-degree aperture" characterizes /e/ and /o/; and "fifth-degree aperture" characterizes /a/. In other words, SIA has a five-degree vowel system.

On the other hand, not all the SIA vowel phonemes have distinctive properties of localization. In SIA, the distinctive vocalic properties of localization are based on what Trubetzkoy (Principles ..., p. 98) calls tongue position: "front" characterizes /i/, /ɪ/, and /e/; and "back" characterizes

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(1) SIA has no vocalic oppositions based on properties of resonance, i.e. "non-nasalized" vs. "nasalized" or "clear" vs. "muffled".

/u/, /ʊ/, and /o/. That is to say, SIA has a two-class (viz. "front" and "back") vowel system. With regard to /ə/ (which Trubetzkoy, ibid., p. 114, regards as an indeterminate phoneme) and /a/ (which Trubetzkoy, ibid., p. 97 calls the maximally open vowel phoneme), the features "front" and "back" are not distinctive "because they are automatically conditioned by the phonic environment" (ibid.);<sup>(1)</sup> /ə/ and /a/ are said to be in a relation of bilateral opposition with each other based on different degrees of aperture (viz. "third-degree aperture" vs. "fifth-degree aperture").

In view of the above observations about the SIA vowel phonemes, SIA is said to have the following five-degree, two-class triangular vowel system:

i	u
ɪ	ʊ
e	o
ə	
a	

Let us now examine the phonological status of 'vowel length' in connexion with /i/ for example. As we have seen above, /i/ may be realized as a long vowel (as in [ʁi:a] 'religious feast'). But in order for this 'phonetic' feature to be regarded as phonologically distinctive, it has to meet both of the following two requirements:

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(1). See sections 9.36 and 9.39 of this thesis.

(a) It has to be possessed by all the realizations of the given phoneme, i.e. /i/, and

(b) It has to be the basis for directly opposing /i/ to at least one of the other vowel phonemes of the SIA phonological system.

The feature 'long' fails to meet the first requirement since /i/ may also be realized as [j] (e.g. ['jæddə] 'handle (n.)') which is a short semi-vocalic sound, i.e. the feature 'long' cannot be regarded as phonologically distinctive since it is not possessed by all the realizations of /i/. The feature 'long' also fails to meet the second requirement since the two features "first-degree aperture" and "front" that have already been established as phonologically distinctive are sufficient to distinguish /i/ from all the other SIA vowel phonemes: "first-degree aperture" distinguishes /i/ from /ɪ/, /e/, /ə/ and /a/; and "front" distinguishes it from /u/ and, indirectly, from /ʊ/ and /o/. That is to say /i/, which may be realized as a 'long' vowel sound, is placed in opposition to /ɪ/, which is always realized as a 'short' vowel sound, on the basis of a difference in degree of aperture (viz. "first-degree aperture" vs. "second-degree aperture"), i.e. the feature 'long' does not help to distinguish /i/ from /ɪ/ phonemically. Therefore, the feature 'long' should not be regarded as phonologically distinctive, i.e. it cannot be considered as a "relevant feature" of /i/. The same argument holds true for the other vowel phonemes that may be realized as 'long' vowel sounds, viz. /u/, /e/, /o/ and /a/.

In conclusion, that is, vowel length is phonologically non-distinctive in SIA.

### 8.17 Is "Vowel Lip-posture" Distinctive?

Vocalic properties of localization based on lip-posture (i.e. lip rounding, in Trubetzkoy's terminology<sup>(1)</sup>) are regarded as phonologically distinctive only in languages (or dialects) where the same degree of aperture and the same property of tongue-position are possessed by two vowel phonemes. In the light of what has been said in section 8.16 above, a given relevant feature of degree of aperture and a given relevant feature of tongue-position together are possessed by one and only one vowel phoneme. For example, the two relevant features "first-degree aperture" and "front", which are possessed by the vowel phoneme /i/, are not together possessed by any other phonemes of the SIA vowel system. Though the feature 'unrounded' characterizes all the realizations of /i/, i.e. [i:] as well as [j], it does not provide the basis for directly opposing /i/ to any of the other vowel phonemes of the SIA phonological system. The phoneme /i/ (which is always realized 'unrounded') is, for example, placed in opposition to /u/ (which is always realized 'rounded') on the basis of the "front"/"back" distinction between them. In other words, the relevant feature "front" is sufficient to distinguish /i/ from /u/ and so the phonetic feature 'unrounded' should not be regarded as phonologically

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(1) See N.S. Trubetzkoy, Principles ..., p. 98.

distinctive. That is to say, 'unrounded' and 'rounded' cannot be considered as "relevant features" of /i/ and /u/, respectively. The same argument holds good for the other vowel phonemes that are always realized 'unrounded' (viz. /ɪ/ and /e/), or 'rounded' (viz. /ʊ/ and /o/). As regards the indeterminate vowel phoneme /ə/ and the maximally open vowel phoneme /a/, they are outside the oppositions of localization in general. In conclusion, the phonetic features 'rounded' and 'unrounded' are phonologically non-distinctive, i.e. vowel lip-posture is phonologically irrelevant in SIA.

#### 8.18. Diphthongs: One or Two Phonemes?

Before investigating the phonological status of the SIA diphthongs, it is important to present my conception of the term 'diphthong'. By 'diphthong' I mean either (a) a succession of two different vowel sounds (e.g. [e:ə]), or (b) a combination of a vowel sound and a semi-vowel preceding or following it (e.g. [əj], [wə], etc.). Generally speaking, diphthongs are, like affricates, articulatorily non-homogeneous phonic products. This might suggest that diphthongs should be interpreted polyphonematically. But once again, physical reality is not linguistically decisive for determining the phonological status of sounds. Thus, we should once again resort to the 'decisive' commutation test in order to reach a definite decision as to the phonological status of the diphthongs of SIA.

Here is an inventory of the SIA diphthongs: [əw] (as in ['dʒəwɪə] 'round' (n.)); [ʌw] (as in [ʃʌwt] 'voice'); [a:w] (as in [fə:w] 'Faw (a town in Iraq)'); [ɑ:w] (as in ['tɑ:wɪr] 'back-gammon'); [e:w] (as in ['me:wə] 'fruit'); [əj] (as in [m̩əj] 'water'); [a:j] (as in [tʃɑ:j] 'tea'); [ɑ:j] (as in ['ʃɑ:jɪr] 'goldsmith'); [o:j] (as in [b̩o:j] 'waiter'); [u:j] (as in [ʔə'b̩u:jə] 'my father'); [e:ə] (as in [ʃe:əf] 'summer'); [o:ə] (as in [m̩o:ət] 'death'); [jə] (as in ['ʔəbjəð] 'white'); [wə] (as in ['wələd] 'boy'); and [wʌ] (as in ['wʌfʌk] 'paper').

Let us consider, for example, the SIA diphthong [əw] in a word like ['dəwɜə] 'training course'. In SIA, [w] may occur without a preceding [ə] and vice-versa, i.e. side by side with ['dəwɜə] 'training course' we have ['dɑ:wɜə] 'exchange it!' and ['dəfɜə] 'kick' (n.)'. In other words, each of the constituent parts of [əw] is commutable with other elements in the SIA phonological system; in the above examples, [ə] is in opposition to [ɑ:], and [w] is in opposition to [ɜ]. This means that [əw] should be interpreted polyphonematically. Since [ə] is, as we have seen in section 8.16, a realization of /ə/, and [w] is, as we have seen in section 8.15, a realization of /u/, the SIA diphthong [əw] should phonologically be considered as a realization of a succession of two separate phonemes, viz. /ə/ + /u/; hence /'dəuɜə/. Through the same argument I have come to the conclusion that [ʌw] is a realization of /ə/ + /u/ ([ʌ] being a combinatory variant of /ə/ as we have seen in section 8.16); [a:w] and [ɑ:w] are realizations of /a/ + /u/ ([a:] and [ɑ:] being combinatory variants of /a/ as we have seen in section 8.16);

[əj] is a realization of /ə/ + /i/ ([j] being a combinatory variant of /i/ as we have seen in section 8.15); [e:w] is a realization of /e/ + /u/ ([e:] being a realization of /e/ as we have seen in section 8.16); [o:j] is a realization of /o/ + /i/ ([o:] being a realization of /o/ as we have seen in section 8.16); and [u:j] is a realization of /u/ + /i/ ([u:] being a realization of /u/ as we have seen in section 8.16). In brief, SIA [əw], [ʌw], [a:w], [ɑ:w], [e:w], [əj], [a:j], [ɑ:j], [o:j] and [u:j] should be interpreted polyphonematically.

On the other hand, let us consider the SIA diphthongs [e:ə] and [o:ə]. They occur in SIA in free variation with the monophthongs [e:] and [o:], respectively, i.e. [ʃe:əf] ~ [ʃe:f] 'summer' and [ʃo:əg] ~ [ʃo:g] 'nostalgia'. The commutation test shows that the first element in each of the SIA diphthongs [e:ə] and [o:ə], i.e. [e:] and [o:], is commutable with zero, e.g. [ʃe:əf] 'summer' vs. [ʃəf] 'class' and [ʃo:əg] 'nostalgia' vs. [ʃəg] 'slit (n.)'. But the second element in each of these two SIA diphthongs, i.e. [ə], is not commutable with any other SIA sounds or zero (the commutation of [ə] with zero is not significant, i.e. [ʃe:əf] and [ʃe:f] both mean 'summer', and [ʃo:əg] and [ʃo:g] both mean 'nostalgia'). Therefore, the SIA words [ʃe:əf] and [ʃo:əg] should phonologically be analyzed into three phonemes each, viz. /ʃ/ + /e/ + /f/ and /ʃ/ + /o/ + /g/, respectively, i.e. [e:ə] and [o:ə] are to be interpreted monophonematically in SIA (see Martinet's Elements ..., p. 74).

Finally, let us examine the phonological status of the SIA diphthongs [jə], [wə] and [wʌ]. For example, let us consider [jə] as in ['ʔəɾjəh̃] 'more comfortable'. The commutation test shows that [ə] may occur without a preceding [j], e.g. ['ʔəɾb̃əh̃] 'I profit or win' (cf. ['ʔəɾjəh̃] 'more comfortable'), and [j] may occur without a following [ə], e.g. [ʔəɾ'ja:h̃] 'various types of scent or perfume' (cf. ['ʔəɾjəh̃] 'more comfortable'). In other words, the constituent elements of [jə] are commutable with other elements in the SIA phonological system; in the above examples [ə] is in opposition to [a:], and [j] is in opposition to [b̃]. Thus, [jə] should be thought of as a realization of two separate phonemes, viz. /i/ + /ə/ ([j] being a realization of /i/ as we have seen in section 8.15). Through the same kind of argument I have come to the conclusion that [wə] and [wʌ] should also be regarded as realizations of /u/ + /ə/ ([w] being a realization of /u/ as we have seen in section 8.15 and [ə] and [ʌ] being combinatory variants of /ə/ as we have seen in section 8.16).

To recapitulate, the SIA diphthongs [əw] (or [ʌw]), [a:w] (or [a:w]), [e:w], [əj], [a:j] (or [a:j]), [o:j], [u:j], [jə], and [wə] (or [wʌ]) are to be interpreted as realizations of two successive phonemes each, i.e. /ə/ + /u/, /a/ + /u/, /e/ + /u/, /ə/ + /i/, /a/ + /i/, /o/ + /i/, /u/ + /i/, /i/ + /ə/ and /u/ + /ə/, respectively. On the other hand, the SIA diphthongs [e:ə] and [o:ə] are to be interpreted as realizations of a single phoneme each, i.e. /e/ and /o/, respectively.



## Chapter Nine

THE SIA PHONEMES AND  
THEIR REALIZATIONS

9.1. Introduction

This chapter indicates what rapprochements are envisaged in order to identify (or define) each of the SIA consonant and vowel phonemes in terms of relevant features, i.e. it provides the basis for Chapter Ten, which deals with the definition of each of the SIA phonemes in terms of relevant features. The present chapter also includes statements about the realizations of each of the SIA phonemes. The identity of a given phoneme is established on the basis of the distinctive oppositions that the respective phoneme enters into in the phonological system of the language (or dialect) under investigation. This means that the identification of a given SIA phoneme will be based on the commutation test, which is performed on the basis of the minimal (or quasi-minimal) pairs involving the respective phoneme on the one hand and other SIA phonemes on the other. In this chapter, I shall indicate the rapprochements existing among the SIA consonant phonemes separately from those existing among the SIA vowel phonemes.<sup>(1)</sup>

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(1) It is to be borne in mind, however, that it is also important (though of secondary importance) to indicate the rapprochements existing among consonant and vowel phonemes (as Martinet does in his La description phonologique...pp.43f). The rapprochements existing among the SIA consonant and vowel phonemes (e.g. a/i as in /dæm/ 'blood' vs. /iæm/ 'near!') will be dealt with in Chapter Twelve.

(A) The SIA Consonant Phonemes

9.2. The Phoneme /p/ and its Realizations.

The phonological identity of the phoneme /p/ is established on the basis of the following distinctive oppositions:

1. p/b as in /'pəuuəf/ 'he veiled (sb. or sth.)' - /'bəuuəf/ 'he put in neutral'; /'ʃopə/ 'kerosene heater' - /'ʃobə/ 'his side or direction'.

2. p/f as in /'parə/ 'the smallest unit of Turkish money' - /'farə/ 'rat'; /'(p)ipɪ/ 'my barrel or drum' - /'(f)ifɪ/ 'name of a girl'.

3. p/m as in /'pia(d)ə/ 'on foot; walking' - /'mia(t)ə/ 'dead'; /'(p)ipɪ/ 'my barrel or drum' - /'(m)imɪ/ 'name of a girl'.

4. p/t as in /'pənkə/ 'air fan' - /'tənkə/ 'jerry can'; /'sopə/ 'kerosene heater' - /'ʃotə/ 'his voice'.

The phoneme /p/ is mostly realized as an unaspirated, non-mufəxxəm, voiceless, bilabial, non-nasal plosive (i.e. [p] ) as in [pɾɪndʒ] 'brass'. It is realized as an aspirated plosive (i.e. [p<sup>h</sup>]) when occurring before vowels in accented initial syllables, for example ['p<sup>h</sup>ərdə] 'curtain', ['p<sup>h</sup>ɪrtʃə] 'brush (n.)', [p<sup>h</sup>i:p] 'barrel', [p<sup>h</sup>e:k] 'dram(of liquor)'. Furthermore, this phoneme, whether it be realized as an unaspirated or as an aspirated plosive, is realized as a mufəxxəm consonant (i.e. [p] or [p<sup>h</sup>]) in the following contexts:

(a) Word-initially before [o:] (as in [p<sub>o</sub>: 'ti:n] 'pair of boots'), [u:] (as in [p<sub>u</sub>: 'ta:zə] 'fire-cracker'), [w] (as in ['p<sub>w</sub>a:lə] 'pieces in the game of dominoes or backgammon'), [ʊ] (as

in [p<sup>h</sup>ʊʃt] 'a bad character'), [ɑ:] (as in [p<sup>h</sup>ɑ:tʃə] 'calf of the leg'), and [ʌ] (as in [p<sup>h</sup>ʌwəʃ] 'he veiled').

(b) Word-medially in the vicinity of other ɱʊfəxxəm consonants, for example [ʃo:pə] 'kerosene heater', [ʔo:'rʊppə] 'Europe', [jɪt'ʃʌmpɹɹ] 'he behaves in an unusual way so as to attract women!', etc.

A final remark about the phoneme /p/: it may be doubled word-initially and word-medially only, for example /ppu:l/ 'with a piece of dominoes or backgammon' and /ʔo:'rʊppə/ 'Europe' (realized as [ppu:l] and [ʔo:'rʊppə], respectively).

### 9.3. The Phoneme /b/ and its Realizations.

The phonological identity of the phoneme /b/ is established on the basis of the following distinctive oppositions:

1. b/p = p/b (see section 9.2 above).
2. b/f as in /bat/ 'he stayed overnight' - /fat/ 'he passed by'; /'ǧɪbəl/ 'mountain' - /'ǧɪfəl/ 'he jumped with fright'.
3. b/m as in /bat/ 'he stayed overnight' - /mat/ 'he died'; /'ǧɪbəl/ 'mountain' - /'ǧɪməl/ 'camel'.
4. b/d as in /bar/ 'drinking bar' - /dar/ 'house'; /'sɔbə/ 'his side or direction' - /'sɔdə/ 'soda water'.

The phoneme /b/ is mostly realized as a non-ɱʊfəxxəm, voiced, bilabial, non-nasal plosive (i.e. [b] ) as in [ʃɪbəd] 'he worshipped'. It is realized as a ɱʊfəxxəm consonant (i.e. [b̥]) in the following contexts:

(a) Next to [o:] (as in [b̥o:ɪ] 'urine' and ['θo:b̥ə] 'his shirt'), [u:] (as in ['b̥u:ɾɪ] 'tube' and [ɾʊs'lu:b̥ə] 'his style or manner of speech'), [w] (as in ['b̥wa:ɾɪ] 'tubes' and ['təwb̥ə] 'make him quit!') and [ʊ] (as in ['b̥ʊhʊɪ] 'stupid' and ['ɛʊb̥jə] 'early morning').<sup>(1)</sup>

(b) In the vicinity of other *ɱʊfəxxəmə* consonants,<sup>(2)</sup> for example [ʂʌ'b̥ɑ:h̥] 'morning', ['b̥ʌʂɾə] 'the city of Basrah', [b̥ʌt:] 'ducks', ['b̥ɑ:ðət] 'it (i.e. hen) laid eggs', [X̥ɑ:ɪ] 'a state of madness', ['b̥ʌk̥kə] 'he left out (sth. or sb.)', [b̥ʌɾɾ] 'land (n.)', etc.

(c) Word-initially before [ɑ:] in loanwords,<sup>(3)</sup> for example ['b̥ɑ:b̥ə] 'father', [b̥ɑ:j'sɪkɪɪ] 'bicycle'; also in native SIA words when [ɑ:] is followed by [g], for example [b̥ɑ:g] 'he stole or robbed'.

(d) In the vicinity of [ʌ] (or [ə]) in words where one of the dorsals [k] (or [k̥]), [g] (or [g̥]), [x] (or [X]) and [ɣ] (or [ɣ̥]) also occurs, for example ['k̥ʌb̥b̥ə] 'he spilt it (i.e. water)' and ['b̥ʌk̥ɾə] 'spool'; [b̥əg:] 'mosquitoes' and ['g̥ʌb̥b̥ət] 'she jumped suddenly'; [b̥ʌX:] 'he sprayed' and ['X̥ʌb̥nə] 'fat (f.sing.)'; [b̥ʌɣ'dɑ:d] 'the city of Baghdad' and ['ɣ̥ʌb̥b̥əʃ] 'he came or went out very early in the morning', respectively.

(1) In the vicinity of [ʌ] (or [ə]), /b/ is nevertheless realized as [b] if it is followed by [j] or [ɪ], for example ['lu:bjə] 'cowpeas' and ['θo:bɪ] 'my shirt'.

(2) Except when [b] occurs next to [i:], [j], [ɪ] or [e:], for example [ɾə'si:b] 'I hit (a target)', [sɪb'ja:n] 'boys', [tɪb:] 'medicine' and [be:ð] 'eggs', respectively.

(3) In this context, native SIA words have [b] instead of [b̥], for example [ba:b] 'door', [ba:t] 'he stayed overnight', etc.

Regardless of whether /b/ is realized as a non-mufəxxəm or as a mufəxxəm consonant, it may sound slightly devoiced (i.e. [b̥] or [b̥]) in word-initial position (for example [b̥e:t] 'house' and [b̥ʌt:] 'ducks') and in word-final position (for example [h̥sa:b̥] 'account (n.)' and [t̥ɑ:b̥] 'he recovered'). Furthermore, this phoneme may be doubled word-initially and word-medially only, for example /'bbələd/ 'at Balad (a town)' and /'həbbət/ 'she fell in love (with)' (realized as ['bbələd] and ['həbbət], respectively).

#### 9.4. The Phoneme /f/ and its Realizations.

The phonological identity of the phoneme /f/ is established on the basis of the following distinctive oppositions:

1. f/p = p/f (see section 9.2 above).
2. f/b = b/f (see section 9.3 above).
3. f/m as in /fɪl/ 'elephant' - /mɪl/ 'mile'; /'hæflə/ 'party' - /'hæmlə/ 'campaign (n.)'; /dæf/ 'tambourine' - /dæm/ 'blood'.
4. f/θ as in /fær/ 'rats' - /θær/ 'revenge (n.)'; /'nɪfər/ 'he shied away' - /'nɪθər/ 'he scattered'; /ræf/ 'shelf' - /ræθ/ 'worn out'.
5. f/ð as in /fəl/ 'he untied' - /ðəl/ 'he humiliated'; /'nɪfər/ 'he shied away' - /'nɪðər/ 'he warned'; /ʃaf/ 'he saw' - /ʃað/ 'eccentric'.
6. f/s as in /fəl/ 'he untied' - /ʃəl/ 'he paralyzed'; /'rɑfɪd/ 'resource' - /'rɑʃɪd/ 'mature man'; /ræf/ 'he left or deserted' - /ræʃ/ 'he lived or survived'.

The phoneme /f/ is mostly realized as a non-ɱʊfəxxəm, voiceless, labio-dental, non-nasal fricative (i.e. [f]) as in [fi:l] 'elephant'. It is realized as a ɱʊfəxxəm consonant (i.e. [ɸ]) in the following contexts:

(a) In the vicinity of [o:] (as in [fɔ:g] 'upstairs' and [ˈno:fə] 'name of a girl'), [u:] (as in [ʔəˈfu:t] 'I pass by' and [ʔəˈʃu:f] 'I see'), [w] (as in [ˈɛəfwən] 'excuse me' and [ˈʔəwɸΔɸ] 'cheaper') and [ʊ] (as in [ʔəfʊk:] 'I open' and [ˈdʒʊfɸə] 'hole in the ground').

(b) In the vicinity of [ə] or [ʌ] in words where one of the dorsals [k] (or [k̲]), [g] (or [g̲]), [x] (or [X]), and [ɣ] (or [ɣ̲]) also occurs, for example [fək:] 'he opened or untied' and [kʌf:] 'the act of hemming; he hemmed'; [ˈwʌgɸə] 'stand (n.)' and [ˈtɪfəg] 'rifles, guns'; [fəx:] 'trap (n.)' and [Xʌf:] 'it became lighter or less concentrated'; [ˈʔəɣfə] 'I fall asleep' and [ʔəfɣɑ:nɪsˈtɑ:nɪ] 'Afghan', respectively.

(c) In the vicinity of other ɱʊfəxxəm consonants,<sup>(1)</sup> for example [sʌf:] 'class', [fɑ:ð] 'it flooded', [ˈmʌfɸʌk] 'roundabout(n.)', [fʌˈki:r] 'poor man', [ˈtʌfɸə] 'jump(n.)'; [kʌˈlɑ:fə] 'well-built', [fɑ:ɸ] 'rats', etc.

A final remark about the phoneme /f/: it may be doubled word-initially and word-medially only, for example /ɸfəuz/ 'with victory' and /ˈsəffəg/ 'he clapped' (realized as [ɸfəwz] and [ˈsʌffəg], respectively).

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(1) Except when [f] occurs next to [i:], [j], [ɪ] or [e:], for example [kəˈfi:s] 'metal strap', [ʔəˈðəɸfə] 'I invite him home', [ˈsɑ:fɪɸə] 'whistle (n.)' and [sɛ:f] 'summer', respectively.

### 9.5. The Phoneme /m/ and its Realizations.

The phonological identity of the phoneme /m/ is established on the basis of the following distinctive oppositions:

1. m/m̥ as in /m̥eɪ/ 'name of a girl' - /m̥eɪ/ 'water'; /ʔə'm̥ən/ 'safe(ty)' - /ʔə'm̥ən/ '(an expression of enthusiastic approval) great, wonderful!'; /'hɪkəm/ 'maxims' - /'hɪkəm/ 'he ruled'.

2. m/n as in /maj/ 'green grain' - /naj/ 'he reached'; /sə'maʔ/ 'sky' - /sə'naʔ/ 'name of a girl'; /ʃəm/ 'he smelled (sth.)' - /ʃən/ 'he launched (an attack)'.

3. m/p = p/m (see section 9.2 above).

4. m/b = b/m (see section 9.3 above).

5. m/f = f/m (see section 9.4 above).

The phoneme /m/ is always realized as a bilabial, voiced, non-mufəxxəm nasal (i.e. [m]) as in [ma:t] 'he died'. In addition, it may be doubled word-medially only, for example /'səmmə/ 'paternal aunt' (realized as ['səmmə]).

### 9.6. The Phoneme /m̥/ and its Realizations.

The phonological identity of the phoneme /m̥/ is established on the basis of the following distinctive oppositions:

1. m̥/m̥ = m̥/m̥ (see section 9.5 above).

2. m̥/t̥ as in /m̥ʊg/ 'target hole in boys' marble games' - /t̥ʊg/ 'arches'; /ʔɪm̥a'rat/ 'emirates' - /ʔɪt̥a'rat/ 'frames'; /s̥əm/ 'fasting(n.)' - /s̥ot̥/ 'whip(n.)'.

3. m̥/ð̥ as in /m̥ər/ 'he passed by' - ð̥ər/ 'he harmed'; /'xum̥rə/ 'fermenting agent' - /'xuð̥rə/ 'vegetables'; /xəm/ 'he

searched or explored' - /xəð/ 'he shook'.

The phoneme /m/ is always realized as a bilabial, ɱʊfəxxəm, voiced nasal (i.e. [m]) as in [mʌs:] 'he sucked or sipped'. In addition, it may be doubled word-medially only, for example /'səmmər/ 'he repaired' (realized as [ˈsʌmmʌr]).

### 9.7. The Phoneme /t/ and its Realizations.

The phonological identity of the phoneme /t/ is established on the basis of the following distinctive oppositions:

1. t/ɸ as in /tin/ 'figs' - /ɸin/ 'mud'; /'nɪtər/ 'he shouted, barked or spoke sharply' - /'nɪɸər/ 'he awaited'; /sot/ 'voice or sound' - /sotɸ/ 'whip(n.)'.

2. t/d as in /tin/ 'figs' - /din/ 'religion'; /'xɪtəm/ 'he ended or completed' - /'xɪdəm/ 'he served'; /ʃɪt/ 'fame' - /ʃɪd/ 'hunt!'

3. t/k as in /tɔm/ 'twins' - /kɔm/ 'pile(n.)'; /'rʊtbə/ 'status or rank' - /'rʊkbə/ 'knee'; /gət/ 'clover' - /gək/ 'jug'.

4. t/θ as in /'tɔbə/ 'repentance' - /'θɔbə/ 'his shirt'; /bət/ 'thin bracelet usually worn several at a time' - /bəθ/ 'broadcasting or transmission'; /'nɪtər/ 'he shouted, barked or spoke sharply' - /'nɪθər/ 'he scattered'.

5. t/n as in /tɔm/ 'twins' - /nɔm/ 'sleep(n.)'; /'ɪftə/ 'I saw him' - /'ɪfnə/ 'we saw'; /gət/ 'clover' - /gən/ 'he became mad'.

The phoneme /t/ is mostly realized as a voiceless, non-ɱʊfəxxəm, non-nasal, unaspirated, alveolar plosive (i.e. [t]) as in ['xɪtəm]



'he ended or completed'. It is realized as an aspirated plosive (i.e. [t<sup>h</sup>]) when occurring before vowels in accented initial syllables, for example [t<sup>h</sup>i:n] 'figs', [t<sup>h</sup>a:dʒɪr] 'merchant' [t<sup>h</sup>e:l] 'lamp post', [t<sup>h</sup>u:θə] 'mulberry tree', [t<sup>h</sup>o:m] 'twins', [t<sup>h</sup>ɪhəm] 'he accused', [t<sup>h</sup>əl:] 'hill', [t<sup>h</sup>ʊχmə] 'indigestion', etc. Furthermore, it may be realized as a dental plosive (i.e. [t̪]) when occurring before [θ], [ð] or [ð̪], for example [ɾət̪'θa:wʌb] 'I yawn', [ɾət̪'ðək̪kɹ] 'I remember', and [ɾət̪'ðɑ:jək̪] 'I feel uneasy or uncomfortable', respectively.<sup>(1)</sup> A final remark about the phoneme /t/: it may be doubled word-initially and word-medially only, for example /t̪aːrɪx/ 'the date or history' and /'sɪttə/'sɪx/ (realized as [t̪aːrɪ:x] and ['sɪttə], respectively).

### 9.8. The Phoneme /d/ and its Realizations.

The phonological identity of the phoneme /d/ is established on the basis of the following distinctive oppositions:

1. d/t = t/d (see section 9.7 above).
2. d/t̪ as in /dɑr/ 'house' - /t̪ɑr/ 'it or he flew or vanished'; /'ɛədə/ 'except' - /'ɛət̪ə/ 'name of a boy'; /xəd/ 'cheek' - /xət̪/ 'handwriting'.
3. d/b = b/d (see section 9.3 above).

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(1) In these examples, among others, [t̪] (or similarly [t̪]) may optionally be assimilated to the following consonant, i.e. [ɾət̪'θa:wʌb] becomes [ɾəθ'θa:wʌb], [ɾət̪'ðək̪kɹ] becomes [ɾəð'ðək̪kɹ] and [ɾət̪'ðɑ:jək̪] becomes [ɾəð'ðɑ:jək̪] (phonemically /ɾəθ'θauab/, /ɾəð'ðək̪kər/ and /ɾəð'ðɑiək̪/, respectively).

4. d/ð as in /dəl/ 'it indicated or proved' - /ðəl/ 'he humiliated'; /'sədɪl/ 'just' - /'səðɪl/ 'enemy'; /ʃəd/ 'he tied' - /ʃəð/ 'he deviated (from)'.

5. d/n as in /dɑː/ 'house' - /nɑː/ 'fire(n.)'; /'sədə/ 'habit' - /'sənə/ 'he suffered'; /xəd/ 'cheek' - /xən/ 'he spoke nasally'.

6. d/g as in /dɑː/ 'he trod(on)' - /gɑː/ 'he touched'; /'rɪdɜː/ 'he punished sb. for being offensive' - /'rɪgɜː/ 'he patched'; /ʃəd/ 'he tied' - /ʃəg/ 'tear (n.)'.

The phoneme /d/ is mostly realized as a voiced, non-mufəxxəm, non-nasal, alveolar plosive (i.e. [d]) as in ['sədə] 'except'. It may sound slightly devoiced (i.e. [d̥]) in word-initial position (for example [d̥rʊːs] 'lessons') and in word-final position (for example [rɑːd̥] 'he wanted'). In addition, it may be doubled word-initially and word-medially only, for example /ddɑː/ 'the house' and /'səddəd/ 'he enumerated' (realized as [d̥dɑːː] and ['səddəd̥], respectively).

### 9.9. The Phoneme /t/ and its Realizations.

The phonological identity of the phoneme /t/ is established on the basis of the following distinctive oppositions:

1. t/t = t/t (see section 9.7 above).
2. t/d = d/t (see section 9.8 above).
3. t/ð as in /tɑː/ 'it or he flew or vanished' - /ðɑː/ 'harmful'; /'ɹæxtər/ 'more dangerous' - /'ɹxðər/ 'green'; /xət/ 'handwriting' - /xəð/ 'he shook'.

4. t/k as in /təs/ 'he visited unexpectedly' - /kəs/ 'priest'; /'bətətər/ 'dissatisfaction' - /'bəkətər/ 'cows'; /hət/ 'he put' - /hək/ 'justice'.

The phoneme /t/ is always realized as a mufəxxəm, un-  
aspirated, voiceless, post-alveolar plosive (i.e. [t̪]) as in [t̪əs:] 'he visited unexpectedly'. In addition, it may be doubled word-initially and word-medially only, for example /'t̪t̪obə/ 'the ball' and /'s̪ət̪t̪əl/ 'he delayed' (realized as [t̪t̪o:bə] and [s̪ʌt̪t̪əl], respectively).

#### 9.10 The Phoneme /θ/ and its Realizations.

The phonological identity of the phoneme /θ/ is established on the basis of the following distinctive oppositions:

1. θ/ð as in /'θærʊə/ 'wealth' - /'ðærʊə/ 'peak (of power or success)'; /'s̪iθər/ 'it or he stumbled' - /'s̪iðər/ 'he excused'; /'nɪ(k)əθ/ 'he broke (an obligation)' - /'nɪ(b)əð/ 'he rejected'.

2. θ/ð as in /θər/ 'revenge(n.)' - /ðər/ 'harmful'; /'xuθrə/ 'curdling agent' - /'xuðrə/ 'vegetables'; /həθ/ 'he encouraged' - /həð/ 'luck'.

3. θ/x as in /θaɪ/ 'he became confused' - /xaɪ/ 'mole'; /ʔə'θɪr/ 'ether' - /ʔə'xɪr/ 'final'; /bəθ/ 'broadcasting (n.)' - /bəx/ 'he sprayed'.

4. θ/t = t/θ (see section 9.7 above).

5. θ/n as in /θər/ 'revenge(n.)' - /nər/ 'fire(n.); /ʔə'θɪr/ 'ether' - /ʔə'nɪr/ 'I light up (the way)'; /həθ/ 'he encouraged' - /hən/ 'he longed for'.

The phoneme /θ/ is always realized as a voiceless, non-mufəxxəm, interdental, non-nasal fricative (i.e. [θ]) as in [θa:ɾ] 'revenge(n.)'. In addition, it may be doubled word-initially and word-medially only, for example /'θθəurə/ 'the revolution' and /'tɾəθθər/ 'he stumbled' (realized as [θθəwɾə] and [tɾəθθəɾ], respectively).

### 9.11. The Phoneme /ð/ and its Realizations

The phonological identity of the phoneme /ð/ is established on the basis of the following distinctive oppositions:

1. ð/θ = θ/ð (see section 9.10 above).
2. ð/ð̣ as in /ðɪɪ/ 'humiliation' - /ð̣ɪɪ/ 'shade';  
/nɪðər/ 'he warned' - /nɪð̣ər/ 'he looked into'; /fəð/ 'ingenious' - /fəð̣/ 'he got (it) over with'.
3. ð/ɣ as in /'ðɪrə/ 'corn' - /'ɣɪrə/ 'glue';  
/'ʃaðɪɪ/ 'boy's name' - /'ʃaɣɪɪ/ 'occupying'; /ʃað/ 'eccentric' - /ʃaɣ/ 'he reacted emotionally to bad news'.
4. ð/ɑ = ɑ/ð (see section 9.8 above).
5. ð/n as in /'ðɪbəh/ 'he slaughtered' - /hɪbəh/ 'it (i.e. the dog) barked'; /'hɪðə/ 'shoe(s)' - /'hɪnə/ 'he bent forward'; /fəð/ 'ingenious' - /fən/ 'art'.

The phoneme /ð/ is always realized as a voiced, non-mufəxxəm labio-dental, non-nasal fricative (i.e. [ð]) as in [ðe:ɪ] 'tail'. In addition, it may be doubled word-initially and word-medially only, for example /ððəuk/ 'the taste' and /'həððər/ 'he warned' (realized as [ððəwɾ] and ['həððəɾ], respectively).

### 9.12. The Phoneme /ð/ and its Realizations.

The phonological identity of the phoneme /ð/ is established on the basis of the following distinctive oppositions:

1. ð/ð̣ = ð̣/ð (see section 9.11 above).
2. ð/θ = θ/ð (see section 9.10 above).
3. ð/ɸ = ɸ/ð (see section 9.9 above).
4. ð/ʃ as in /ð̣aǵ/ 'he became bored or upset' - /ʃ̣aǵ/ 'teakwood'; /ʃ̣ə'ð̣idə/ 'his backer or supporter' - /ʃ̣ə'ʃ̣idə/ 'thick porridge made of flour, oil or butter, and sugar'; /xəð/ 'he shook' - /xəʃ/ 'he specified'.

The phoneme /ð/ is always realized as a mufəxxəm, voiced, interdental fricative (i.e. [ð̣] ) as in [ʃ̣ə'ð̣i:d] 'backer or supporter'. In addition, it may be doubled word-initially and word-medially only, for example /ð̣ð̣eɸ/ 'the guest' and /'ʃ̣əð̣ð̣ə/ 'bite (n.)' (realized as [ð̣ð̣e:ɸ] and ['ʃ̣ʌð̣ð̣ə], respectively).

### 9.13. The Phoneme /k/ and its Realizations.

The phonological identity of the phoneme /k/ is established on the basis of the following distinctive oppositions:

1. k/g as in /'kubbə/ 'meatballs made from meat with rice or cracked wheat and spices' - /'gubbə/ 'room'; /'ʃ̣ɪkə/ 'he complained' - /'ʃ̣ɪgə/ 'he worked very hard'; /ʃ̣ək/ 'suspicion' - /ʃ̣əg/ 'tear (n.)'.
2. k/ḵ as in /kas/ 'cup' - /ḵas/ 'he measured'; /'sɪkət/ 'he shut up' - /'sɪḵət/ 'she watered'; /hək/ 'he scratched' - /həḵ/ 'justice'.

3. k/t = t/k (see section 9.7 above).
4. k/x as in /kəd/ 'he worked hard' - /xəd/ 'cheek';  
/ʔəkʊ/ 'there is' - /ʔəxʊ/ 'brother'; /fək/ 'he opened' -  
/fəx/ 'trap (n.)'.
5. k/n as in /kas/ 'cup' - /nas/ 'people'; /'kokə/ 'coke' -  
/'konə/ 'argument'; /hək/ 'he scratched' - /hən/ 'he longed  
(for)'.

The phoneme /k/ is mostly realized as a voiceless, non-mufəxxəm, unaspirated, velar, non-nasal plosive (i.e. [k] ) as in [kɪ'ta:b] 'book (n.)'. It is realized as an aspirated plosive (i.e. [kʰ] ) when occurring before vowels in accented initial syllables, for example [kʰa:s] 'cup', [kʰe:k] 'cake', ['kʰɪtəb] 'he wrote', [kʰɪ:s] 'sack (n.)'. Furthermore, it is realized as a post-velar plosive (i.e. [k̠]) when occurring before [u:] (as in [k̠u:s] 'cups'), [w] (as in ['k̠wa:xə] 'huts'), [o:] (as in [k̠o:m] 'pile' (n.)), and ['h̠ukʊm] 'regime'. A final remark about the phoneme /k/: it may be doubled word-medially only, for example /'həkəkə/ 'itch (n.)' (realized as ['həkəkə]).

#### 9.14 The Phoneme /g/ and its Realizations

The phonological identity of the phoneme /g/ is established on the basis of the following distinctive oppositions:

1. g/k = k/g (see section 9.13 above).
2. g/ɣ as in /gas/ 'he touched' - /ɣas/ 'he measured';  
/'səɣɪd/ 'narrow street' - /'səɣɪd/ 'contract(n.)'; /dæg/ 'he knocked' -

/dæk/ 'he sickened sb. (with irritation, etc.)'.

3. g/d = d/g (see section 9.8 above).

4. g/ɣ as in /gəʃ/ 'he cut off' - /ɣəʃ/ 'he choked';  
/ʃɪgər/ 'eagle' - /ʃɪɣər/ 'childhood'; /dæg/ 'he knocked' -  
/dæɣ/ 'he pinched (sb.) for attention'.

5. g/n as in /gas/ 'he touched' - /nas/ 'people';  
/ʃugə/ 'his market' - /ʃunə/ 'name of a boy'; /ʃæg/ 'tear  
(n.)' - /ʃən/ 'he launched (an attack)'.

The phoneme /g/ is mostly realized as a voiced, non-nasal, non-fortis, velar, non-nasal plosive (i.e. [g] ) as in [ʃu:gə] 'his market'. It is realized as a post-velar plosive (i.e. [ŋ] ) when occurring before [u:] (as in [ʔə'gɯ:ɪ] 'I say'), [w] (as in [ʃgwa:ʃɪʃ] 'large two-handled baskets, woven of palm leaves'), [ʊ] (as in [ʃgʊb̥b̥ə] 'room'), and [o:] (as in [gɔ:z] 'longbow'). Furthermore, it may sound slightly devoiced (i.e. [g̊] ) in word-initial position (for example [g̊a:ɪ] 'he said') and word-final position (for example [b̥a:ɡ̊] 'he stole or robbed'). A final remark about the phoneme /g/: it may be doubled word-medially only, for example /rəggə/ 'turtle' (realized as [r̥əggə]).

### 9.15. The Phoneme /x/ and its Realizations

The phonological identity of the phoneme /x/ is established on the basis of the following distinctive oppositions:

1. x/ɣ as in /xəʃ/ 'he specified' - /ɣəʃ/ 'he choked'; /ʔəxbər/ 'he told' - /ʔəɣbər/ 'dull'; /ʃax/ 'he became self-important or pompous' - /ʃay/ 'he reacted emotionally to bad news'.

2. x/k̥ as in /xəs/ 'lettuce' - /k̥əs/ 'priest'; /səxɪ/ 'generous' - /sək̥ɪ/ 'irrigation'; /ʃax/ 'he became self-important

or pompous' - /ʃaḵ/ 'difficult'.

3. x/θ = θ/x (see section 9.10 above).
4. x/k = k/x (see section 9.13 above).
5. x/n as in /xas/ 'it went bad or spoiled' - /nas/ 'people'; /ʔə'xir/ 'final' - /ʔə'nir/ 'I light up (the way)'; /fəx/ 'trap (n.)' - /fən/'art'.

The phoneme /x/ is mostly realized as a voiceless, non-nasal, velar, non-nasal fricative (i.e. [x] ) as in [xəs:] 'lettuce'. It is realized as a uvular fricative (i.e. [χ] ) when occurring before [u:] (as in ['χu:ðə] 'helmet'), [w] (as in ['χwa:rdə] 'generous'), [ʊ] (as in ['χʊbʊz] 'bread'), and [o:] (as in [χo:ɸ] 'fear, fright'). In addition, it may be doubled word-medially only, for example /'ʔəxxər/ 'he delayed' (realized as ['ʔəxxər]).

#### 9.16. The Phoneme /ɣ/ and its Realizations

The phonological identity of the phoneme /ɣ/ is established on the basis of the following distinctive oppositions:

1. ɣ/x = x/ɣ (see section 9.15 above).
2. ɣ/ḵ as in /ɣəṣ/ 'he choked' - /ḵəṣ/ 'he narrated or told (a story)'; /bə'ɣaʔ/ 'prostitution' - /bə'ḵaʔ/ 'survival'. /ʃaɣ/ 'he reacted emotionally to bad news' - /ʃaḵ/ 'difficult'.
3. ɣ/g = g/ɣ (see section 9.14 above).
4. ɣ/ð = ð/ɣ (see section 9.11 above).
5. ɣ/n as in /ɣəṣ/ 'he choked' - /nəṣ/ 'text'; /'buɣiə/



'desired object' - /'buniə/ 'physique'; /ʃay/ 'he formed or created' - /ʃan/ 'he respected and protected'.

The phoneme /ɣ/ is mostly realized as a voiced, non-mufəxxəm, velar, non-nasal fricative (i.e. [ɣ] ) as in [ɣe:m] 'cloud(s)'. It is realized as a uvular fricative (i.e. [ʁ] ) when occurring before [u:] (as in [ɣu:l] 'ghoul'), [w] (as in ['ləɣwə] 'heated argument'), [ʊ] (as in ['ɟʊɣʊ] 'work'), and [o:] (as in [ɣo:'rɪllə] 'gorilla'). In addition, it may be doubled word-medially only, for example /'zəɣɣər / 'he made (sth.) smaller' (realized as ['zəɣɣər]).

#### 9.17. The Phoneme /k/ and its Realizations

The phonological identity of the phoneme /k/ is established on the basis of the following distinctive oppositions:

1. k/ḳ = ḳ/k (see section 9.13 above).
2. ḳ/g = g/ḳ (see section 9.14 above).
3. ḳ/x = x/ḳ (see section 9.15 above).
4. ḳ/ɣ = ɣ/ḳ (see section 9.16 above).
5. ḳ/ɟ = ɟ/ḳ (see section 9.9 above ).

This phoneme is always realized as a mufəxxəm, voiceless, uvular, unaspirated plosive as in ['kʊ:rɪ] 'tea-pot', [ḳaws] 'arch', ['ḳʊdɟə] 'capability', [ḳɑ:s] 'he measured', ['ṣəḳɪl] 'mind', ['ḳi:mə] 'price', ['ḳe:də] 'razor blade', ['ḳo:zəɣ] 'he gave someone the shaft' and ['ḳwɑ:ɟɪ] 'tin boxes'. In addition, it may be doubled word-medially and word-finally only, for example /'ṣəḳḳəd/ 'he

complicated' and /ʃəʔk̩/ 'hardship' realized as [ʃ̣əʔk̩əð] and [ʃəʔk̩], respectively).

### 9.18. The Phoneme /n/ and its Realizations

The phonological identity of the phoneme /n/ is established on the basis of the following distinctive oppositions:

1. n/m = m/n (see section 9.5 above).
2. n/t = t/n (see section 9.7 above).
3. n/d = d/n (see section 9.8 above).
4. n/θ = θ/n (see section 9.10 above).
5. n/ð = ð/n (see section 9.11 above).
6. n/k = k/n (see section 9.13 above).
7. n/g = g/n (see section 9.14 above).
8. n/x = x/n (see section 9.15 above).
9. n/ɣ = ɣ/n (see section 9.16 above).

This phoneme is mostly realized as a voiced, alveolar, nasal (i.e. [n] ) as in [na:s] 'people'. It is optionally realized as a dental nasal (i.e. [n̠] ) when occurring before [θ] (as in [n̠θa:ɸ] 'he was aroused'), [ð] (as in [ʔən̠ða:ɪ] 'depraved people') and [ð̥] (as in [n̠ð̥u:ɸ̥] 'we taste'). Furthermore, it is optionally realized as a velar nasal (i.e. [ŋ] ) before [k] or [k̠] (e.g. [pʰəŋkə] 'airfan ') and [g] or [g̠] (e.g. [ʔəŋgəs] 'worse'), and as a uvular nasal (i.e. [ɴ] ) before [k̠] (e.g. [ʔəɴk̠əð] 'he rescued'). In careful speech, however, [n̠] , [ŋ] and [ɴ] are usually replaced by [n], hence [nθa:ɸ], [ʔən'ða:ɪ], [nð̥u:ɸ̥],

['ʔənkuɾ], ['ʔəngəs] and ['ʔənɰəð], respectively. A final remark about the phoneme /n/: it may be doubled word-initially and word-medially, for example /nnas/ 'the people' and /'ǧənnə/ 'heaven' (realized as [nna:s] and ['dʒənnə], respectively).

### 9.19. The Phoneme /r/ and its Realizations

The phonological identity of the phoneme /r/ is established on the basis of the following distinctive oppositions:

1. r/l as in /'sɪræg/ 'he sweated or perspired' - /'sɪlæg/ 'he set on fire'; /frɑɾ/ 'bed' - /flɑɾ/ 'flash gun'; /hər/ 'hot weather' - /həl/ 'solution'.

2. r/s as in /rəd/ 'reply (n.)' - /səd/ 'dam'; /'fəru/ 'fur' - /'fəsʊ/ 'soundless breaking wind'; /dɑr/ 'house' - /das/ 'he trod (on)'.

3. r/z as in /rɑd/ 'he wanted' - /zɑd/ 'it increased'; /'sɪrəf/ 'he knew' - /'sɪzəf/ 'he played (a musical instrument)'; /hər/ 'hot weather' - /həz/ 'notch'.

The phoneme /r/ is mostly realized as a voiced, mufəxxəm, alveolar flap (i.e. [ɾ]) as in [sə'ɾu:s] 'bride', [sɪ'ɾə], 'picture', [ʔəɾ'wa:h] 'souls', [dɔ'ɾə] 'his turn', [tɾe:lə] 'trailer', [dəɾʊb] 'road', [bɪ'ɾə] 'beer', [sɪ'ɾə] 'turn', [dɑ'ɾ] 'house'. It is realized as a non-mufəxxəm consonant (i.e. [r]) when occurring before [i:] (as in [bɔ'ɾi:d] 'post-office' and [ɾi:j] 'feather(s)'), [j] (as in [ɾja:'dʒi:l] 'men' and [sɑ'ɾjə] 'naked'), and [ɪ] (as in [ɾɪsəm] 'he

painted' and ['dærɪs] 'lesson')<sup>(1)</sup> In addition, it may be doubled word-initially, word-medially and word-finally, for example /rɪs/ 'the Russians', /'tʰærrəʒ/ 'he graduated' and /ʃærr/ 'wickedness' (realized as [ʃɪu:s], ['tʰæɾɾəʒ] and [ʃəɾɾ], respectively).

### 9.20. The Phoneme /l/ and its Realizations

The phonological identity of the phoneme /l/ is established on the basis of the following distinctive oppositions:

1. l/l̥ as in /'xələf/ 'successor' - /'xələf/ 'name of a boy';  
/xəl/ 'mole' - /xəl̥/ 'maternal uncle'.
2. l/r = r/l (see section 9.19 above).

This phoneme is mostly realized as a voiced, non-mufəxxəm, alveolar lateral (i.e. [l]) as in [xɪ'la:l] 'during'. It is realized as a slightly devoiced consonant (i.e. [l̥]) when occurring after [p] (as in ['plɑ:jɪs] 'pliers'), [t] (as in ['tɪlɑ:θə] 'three') and [k] (as in ['kɪe:tʃə] 'cookie-like pastry'). In addition, it may be doubled word-medially only, for example /'sɪllə/ 'defect' (realized as ['sɪllə]).

### 9.21. The Phoneme /ɹ/ and its Realizations

The phonological identity of the phoneme /ɹ/ is established on the basis of the following distinctive oppositions:

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(1) Before [i:] and [ɪ], the phoneme /r/ is nevertheless realized as a mufəxxəm consonant if it is preceded by another mufəxxəm consonant, for example [ʃɪi:x] 'yelling (n.)' etc. and ['mʊt.ɹɪb] 'male singer', etc.

1. ɭ/ɭ = ɭ/ɭ (see section 9.20 above).
2. ɭ/ʂ as in /'xɪɭə/ 'it became empty' - /'xɪʂə/ 'he castrated'; /xəɭ/ 'vinegar' - /xəʂ/ 'he specified'.

This phoneme is always realized as a voiced, mufəxxəm, alveolar lateral (i.e. [ɭ]) as in ['gɪɭɔb] 'he turned over'. In addition, it may be doubled word-medially only, for example /'uɐɭɭə/ 'by the name of God' (realized as ['wɔɭɭə]).

### 9.22. The Phoneme /s/ and its Realizations

The phonological identity of the phoneme /s/ is established on the basis of the following distinctive oppositions:

1. s/z as in /səd/ 'it prevailed or dominated' - /zəd/ 'it increased'; /'hɪsɪn/ 'beauty' - /'hɪzɪn/ 'mourning'; /həs/ 'he felt' - /həz/ 'notch'.
2. s/ʂ as in /sef/ 'sword' - /ʂef/ 'summer'; /'hɪsəd/ 'he envied' - /'hɪʂəd/ 'he reaped or harvested'; /xəs/ 'lettuce' - /xəʂ/ 'he specified'.
3. s/h as in /səd/ 'dam' - /həd/ 'limit (n.)'; /'ʔə'sɪr/ 'captive' - /'ʔə'hɪr/ 'I become confused or undecided'; /ras/ 'head' - /raħ/ 'he went or left'.

The phoneme /s/ is always realized as a voiceless, non-mufəxxəm, apical hiss (i.e. [s]) as in [se:f] 'sword'. In addition, it may be doubled word-initially and word-medially, for example /ssəd/ 'the dam' and /'hɪssə/ 'now' (realized as

[ssəd] and ['hissə], respectively).

### 9.23 The Phoneme /z/ and its Realizations

The phonological identity of the phoneme /z/ is established on the basis of the following distinctive oppositions:

1. z/s = s/z (see section 9.22 above).
2. z/ʂ as in /zar/ 'he visited' - /ʂar/ 'it or he became'; /'səzə/ 'mourning ceremony' - /'səʂə/ 'walking stick'; /γaz/ 'gas' - /γaʂ/ 'it or he dived'.
3. z/ʕ as in /zar/ 'he visited' - /ʕar/ 'disgrace'; /'ǧɪzər/ 'carrots' - /'ǧɪʕər/ 'it or he brayed'; /ǧaz/ 'he quit' - /ǧaʕ/ 'he became or felt hungry'.

The phoneme /z/ is always realized as a voiced, non-mufəxxəm, apical hiss (i.e. [z] ) as in ['dʒɪzər] 'carrots'.

In addition, it may be doubled word-initially and word-medially only, for example /zzəuǧ/ 'the husband' and /'səzzə/ 'he consoled or comforted' (realized as [zzəwɔʒ] and ['səzzə], respectively).

### 9.24 The Phoneme /ʂ/ and its Realizations

The phonological identity of the phoneme /ʂ/ is established on the basis of the following distinctive oppositions:

1. ʂ/s = s/ʂ (see section 9.22 above).
2. ʂ/z = z/ʂ (see section 9.23 above).
3. ʂ/ɭ = ɭ/ʂ (see section 9.21 above).

This phoneme is always realized as a mufəxxəm, voiceless,

apical hiss (i.e. [ʃ]) as in ['lɔ:ʃə] 'mess (n.)'. In addition, it may be doubled word-initially and word-medially, for example /'ʃʃurə/ 'the picture' and /'həʃʃəl / 'he gained' (realized as ['ʃʃu:ɹə] and ['həʃʃəl], respectively).

### 9.25. The Phoneme /č/ and its Realizations

The phonological identity of the phoneme /č/ is established on the basis of the following distinctive oppositions:

1. č/ǰ as in /čai/ 'tea' - /ǰai/ 'here'; /'nəčɪɹ/ 'defiant' - /'nəǰɪɹ/ 'chopping'; /hač/ 'take! (f. sing.)' - /haǰ/ 'it or he became excited or furious'.
2. č/ɟ as in /'čarək/ 'a quarter' - /'ɟarək/ 'he participated'; /'həčɪ/ 'talking' - /'həɟɪ/ 'filling up with unnecessary stuff'; /fəč/ 'jawbone' - /fəɟ/ 'he deflated'.
3. č/k as in /čak/ 'base down, the winning position' - /kak/ 'tap or cock'; /'bačɪɹ/ 'tomorrow' - /'bakɪɹ/ 'virgin'; /'fʊrəč/ 'brushes (n.)' - /'fʊrək/ 'he rubbed.'

The phoneme /č/ is always realized as a voiceless, palato-alveolar, hushing affricate (i.e. [tʃ]) as in [tʃa:j] 'tea'. In addition, it may be doubled word initially and word-medially only, for example /ččəɹɪx/ 'the wheel' and /'sɪččə/ 'railroad track' (realized as [tʃtʃəɹɪx] and ['sɪttʃə], respectively).

### 9.26. The Phoneme /ǰ/ and its Realizations

The phonological identity of the phoneme /ǰ/

is established on the basis of the following distinctive oppositions:

1.  $\check{s}/\check{c} = \check{c}/\check{s}$  (see section 9.25 above).
2.  $\check{s}/\check{r}$  as in / $\check{g}\check{u}\check{s}$ / 'lime' - / $\check{r}\check{u}\check{s}$ / 'fish hook'; / ${}^{\prime}\check{a}\check{g}m\check{a}l$ / 'more beautiful' - / ${}^{\prime}\check{a}r\check{m}\check{a}l$ / 'more comprehensive, exhaustive or detailed'; / ${}^{\prime}a\check{g}$ / 'ivory' - / ${}^{\prime}a\check{r}$ / 'he lived or survived'.
3.  $\check{s}/g$  as in / $\check{g}a\check{d}$ / 'conscientious' - / $ga\check{d}$ / 'he held (sb.) by the hand'; / ${}^{\prime}ni\check{g}\check{a}r$ / 'he chopped' - / ${}^{\prime}ni\check{r}\check{a}r$ / 'it or he tapped or beat'; / $\check{a}\check{g}$ / 'he became bored or upset' - / $\check{a}g$ / 'he tasted'.

The phoneme / $\check{g}$ / is always realized as a voiced, palato-alveolar, hushing affricate (i.e. [dʒ] ) as in [dʒi:l] 'generation'. In addition, it may be doubled word-initially and word-medially only, for example / $\check{g}\check{g}\check{a}u$ / 'the weather' and / ${}^{\prime}h\check{i}\check{g}\check{g}\check{a}$ / 'excuse (n.)' (realized as [dʒdʒəw] and [{}^{\prime}h\check{i}dʒdʒə], respectively).

### 9.27. The Phoneme / $\check{r}$ / and its Realizations

The phonological identity of the phoneme / $\check{r}$ / is established on the basis of the following distinctive oppositions:

1.  $\check{r}/\check{c} = \check{c}/\check{r}$  (see section 9.25 above).
2.  $\check{r}/\check{s} = \check{s}/\check{r}$  (see section 9.26 above).
3.  $\check{r}/r = r/\check{r}$  (see section 9.4 above).

This phoneme is always realized as a voiceless, palato-alveolar, hushing fricative (i.e. [ʃ] ) as in [ʃə:ʃ] 'wickedness'. It may be doubled word-initially and word-medially, for example



/ˈʃʃəʒərə/ 'the tree' and /ˈhəʃʃə/ 'he stuffed or filled with stuffing' (realized as [ˈʃʃədʒərə] and [ˈhəʃʃə], respectively).

### 9.28. The Phoneme /h/ and its Realizations

The phonological identity of the phoneme /h/ is established on the basis of the following distinctive oppositions:

1. h/ɹ as in /həd/ 'limit (n.)' - /ɹəd/ 'he counted';  
/ʔəˈhɪd/ 'I deviate from' - /ʔəˈɹɪd/ 'I repeat'; /bɑh/ 'he revealed (a secret)' - /bɑɹ/ 'he sold'.
2. h/s = s/h (see section 9.22 above).

This phoneme is mostly realized as a voiceless, non-mufəxxəm, pharyngeal fricative (i.e. [h]) as in [həd:] 'limit (n.)'.

It may be realized as a mufəxxəm consonant (i.e. [ħ]) when occurring before [u:] (as in [ʃħu:n] 'plates'), [w] (as in [ˈʃħwə] 'consciousness'), [v] (as in [ˈħvɹə] 'lip-stick'), and [o:] (as in [ˈħo:bə] 'punishment by God'). In addition, it may be doubled word-medially only, for example /ˈʃħħə/ 'health' (realized as [ˈʃħħə]).

### 9.29. The Phoneme /ɹ/ and its Realizations

The phonological identity of the phoneme /ɹ/ is established on the basis of the following distinctive oppositions:

1. ɹ/h = h/ɹ (see section 9.28 above).
2. ɹ/z = z/ɹ (see section 9.23 above).

This phoneme is mostly realized as a voiced, non-mufəxxəm, pharyngeal fricative (i.e. [ʕ] ) as in [ʕa:ɖ] 'he returned'. In addition, it may be realized as a mufəxxəm consonant (i.e. [ʕ] ) when occurring before [u:] (as in [ʕu:ɖ] 'matchstick'), [w] (as in ['dʌʕwə] 'invitation'), [ʊ] (as in ['ʕumʊɕ] 'age'), and [o:] (as in ['ʕo:ɕə] 'blind in one eye (f. sing)'). Furthermore, it may be doubled word-medially only, for example /'bəʕʕəd/ 'he moved away' (realized as ['bəʕʕəd]).

### 9.30. The Phoneme /ʕ/ and its Realizations

The phonological identity of the phoneme /ʕ/ is established on the basis of the following distinctive oppositions:

1. ʕ/h as in /'ʕɪɖə/ 'he came or showed up' - /'hɪɖə/ 'he satirized or ridiculed (esp. in poetry)'; /'sɪʕəl/ 'he asked' - /'sɪhəl/ 'it became simple'; /'tɲəbbəʕ/ 'he predicted' - /'tɲəbbəh/ 'he realized or became aware'.

2. ʕ/k as in /ʕas/ 'ace (in a game of cards)' - /kas/ 'cup'; /'ɾɪʕəs/ 'he headed or became Chairman' - /'ɾɪkəs/ 'it or he went down'; /ħaʕ/ 'the name of the letter "ħ"' - /ħak/ 'he knitted'.

3. ʕ/g as in /ʕas/ 'ace (in a game of cards)' - /gas/ 'he touched'; /'saʕət/ 'it or she became worse' - /'sagət/ 'she drove or rode (an animal)'; /baʕ/ 'the name of the letter "b"' - /bag/ 'he stole or robbed'.

The phoneme /ʕ/ is mostly realized as a non-mufəxxəm, glottal plosive (i.e. [ʔ] ) as in [ʔa:s] 'ace (in a game of

cards)'.<sup>(1)</sup> It is realized as a mufəxxəm consonant (i.e. [ʔ] ) when occurring before [u:] (as in [kʊ'ʔu:s] 'cups'), [w] (as in ['mʌʔwə] 'shelter (n.)'), [ʊ] (as in [ʔʊm:] 'mother'), and [o:] (as in [ʔo:'fʊppə] 'Europe'). In addition, it may be doubled word-medially only, for example /'rəʔʔəs/ 'he appointed (sb.) as leader or Chairman' (realized as ['rəʔʔəs]).

### 9.31. The Phoneme /h/ and its Realizations

The phonological identity of the phoneme /h/ is established on the basis of the following distinctive oppositions:

1. h/ʔ = ʔ/h (see section 9.30 above).
2. h/k as in /həd/ 'he let go' - /kəd/ 'he worked hard'; /'sɪhər/ 'he stayed up late' - /'sɪkər/ 'he became drunk'; /ʃah / 'Shah ' - /ʃak/ 'being in doubt or suspicion'.

This phoneme is mostly realized as a voiceless, non-mufəxxəm, glottal fricative (i.e. [h] ) as in [həd:] 'he let go'. It may be realized as a mufəxxəm consonant (i.e. [ħ] ) when occurring before [u:] (as in [jə'ħu:d] 'Jews (n. and adj.)'), [w] (as in ['gəħwə] 'coffee'), [ʊ] (as in ['ħʊmmə] 'they') and [o:] (as in [ħo:f] 'marsh'). In addition, it may be realized as voiced (i.e. [ɦ] or [ʁ] ) when occurring intervocalically (as in [jəɦu:d] 'Jews (n. and adj.)') or between a voiced consonant and a vowel (as in ['ʔədɦəm] 'name of a boy'). A final remark about the phoneme /h/ : it may be doubled word-medially only, for example /'səhhəl/ 'he made (sth.) easy' (realized as ['səhhəl] ).

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(1) It is uncertain whether [ʔ] should be considered voiceless or voiced. However, S.H. Al-Ani ("The Development and Distribution of the Arabic Sound Qaf in Iraq" in his RAL, pp. 103-112) rightly states that [ʔ] was mistakenly included with the 'voiced' consonants by the old Arab grammarian si:bəwəjhī and his followers. He further says [ʔ] cannot be considered as 'voiced' because "the vocal cords are momentarily closed in the production of this sound" (p. 104) and so "they obviously cannot vibrate at the same time" (ibid).

(B) The SIA Vowel Phonemes9.32. The Phoneme /i/ and its Realizations

The phonological identity of the phoneme /i/ is established on the basis of the following distinctive oppositions:

1. i/u as in /'iæddə/ 'handle (n.)' - /'uæddə/ 'he sent'; /'sɪd/ 'religious feast' - /'sɪd/ 'matchstick'; /hæi/ 'alive' - /həu/ 'wild plant'.
2. i/ɪ as in /sɪm/ 'thin metal rod' - /sɪm/ 'poison (n.)'.

This phoneme is mostly realized as a non-nasalized, front, unrounded, long vowel of a first- (i.e. minimum) degree aperture (i.e. [i:] ) as in [sɪ:d] 'religious feast'. The actual length of this vowel, among other SIA vowels, varies according to whether it occurs in an accented syllable or in an unaccented syllable: it is relatively longer when accompanied by an accent, e.g. [dʒi·'bi:] 'bring it or him! (sing. addressee)'. It is important to point out that when /i/, among other SIA phonemes that are usually realized as long vowels, is opposed (in final position in polysyllabic words) to phonemes that are realized as short vowels (i.e. /ɪ/, /ʊ/ and /ə/), it is always the case that the accentual patterns of the respective words are different; for example the accent falls on the final syllable in a word like /ʔəuəd'di/ 'I send it or him' while it falls on the penultimate syllable in a word like /ʔə'uæddɪ/ 'I send'. In addition, when /i/ occurs between two nasals or between a nasal sound and a non-nasal sound, it is realized as a slightly nasalized vowel, for example

[ʔə'mi:n] 'safe', [tʰi:n] 'figs', [mi:l] 'mile', etc. It is, furthermore, essential to note that the phoneme /i/ is realized as a palatal semi-vowel, i.e. [j], which is of a consonantal character, in the following contexts:

(a) Word-initially before a vowel sound, for example ['jæddə] 'handle (n.)', [jo:m] 'day', etc. (phonemically /'iæddə/ and /iom/, respectively).

(b) Word-initially before a consonant sound, for example [jbu:s] 'he kisses', [jri:d] 'he wants', etc. (phonemically /ibus/ and /irid/, respectively).

(c) In initial syllables between a consonant and a long vowel, for example [ðja:l] 'hem or border (of a dress, skirt, etc.)', [wja:k] 'with you', etc. (phonemically /ðial/ and /uiak /, respectively).

(d) Intervocally, for example ['həjə] 'timidity', [xə'ja:l] 'imagination', etc. (phonemically /'həiə/ and /xə'ial/, respectively).

(e) Between a vowel and a consonant, for example [ʔəj'ta:m] 'orphans', ['hə:ɟə] 'bewildered (f. sing)', etc. (phonemically /ʔəi'tam/ and /'həirə/, respectively).

(f) Between a consonant and a vowel, for example [ʔəj'ja:ʔ] 'things', ['hə:ɟə] 'edge', etc. (phonemically /ʔəj'iaʔ/ and /'həɟiə/, respectively).

(g) Word-finally when preceded by a vowel, for example [tʃa:j] 'tea', [bɔ:j] 'waiter', etc. (phonemically /çai/ and /boi/, respectively).

In addition, the phoneme /i/ may (as we have seen above) be realized as a consonant, i.e. [j]. In this case, /i/ may be doubled, e.g. /'iiəbbɪs/ 'he dries up' and /'həiiə/ 'snake', (realized as ['jjəbbɪs] and ['həjjə] respectively). A final remark about the phoneme /i/, which also applies to /u/: they are the only vowel phonemes that are opposable to consonant phonemes (in all three word positions)- this is because /i/ and /u/ may be realized consonantly, i.e. as [j] and [w] respectively, for example /iəm/ 'near' - /dəm/ 'blood'; /'həiə/ 'timidity' - /'hələ/ 'sweetness or beauty'; /həi/ 'alive' - /həd/ 'limit (n.)' (see also section 9.33).

### 9.33. The Phoneme /u/ and its Realizations

The phonological identity of the phoneme /u/ is established on the basis of the following distinctive oppositions:

1. u/i = i/u (see section 9.32 above).
2. u/ʊ as in /ʃuːf/ 'wool' - /ʃʊf/ 'arrange in rows'.

This phoneme is mostly realized as a non-nasalized, back, rounded, long vowel of a first-degree aperture (i.e. [u:]) as in [ʃuːf] 'wool'. Like /i/, the phoneme /u/ is realized longest when it occurs in accented syllables, e.g. [ˈbʊːʃə] 'inch'; cf. [ssuːˈdaːn] 'the Sudan'. Furthermore, when /u/ is opposed to phonemes that are realized as short vowels (i.e. /ɪ/, /ʊ/ and /ə/) in final position in polysyllabic words, it is always the case that the

accentual patterns of the respective words are different; for example the accent falls on the final syllable in a word like /uəd'du/ 'send it or him! (pl. addressee)' while it falls on the initial syllable in a word like /'uəddu/ 'send! (pl. addressee)'. Like all SIA vowel phonemes, /u/ is realized as a slightly nasalized vowel (i.e. [ũ:] ) when occurring between two nasals or between a nasal and a non-nasal consonant, for example ['mũ:nə] 'flavour', [nũ:ɸ] 'light (n.)', etc.

The phoneme /u/ is also realized as a labio-velar semi-vowel, i.e. [w] which is of a consonantal character, in the same contexts as those for the occurrence of [j] as a combinatory variant of /i/ (see section 9.32 above). Here are the examples corresponding to the respective contexts:

- (a) ['wəddə] 'he sent', [we:n] 'where?' etc. (phonemically /'uəddə/ and /uen/, respectively),
- (b) ['wʃi:ʃə] 'skein (of string)', [wgu:ɸ] 'standing (n.)', etc. (phonemically /'uʃiʃə/ and /uguf /, respectively),
- (c) [ɸwa:h] 'souls', ['swa:lɪf] 'stories', etc. (phonemically /ɸuah/ and /'sualɪf/, respectively),
- (d) ['həwə] 'air', ['ɸa:wə] 'frying pan', etc. (phonemically /'həuə/ and /'ɸauə/, respectively),
- (e) ['dʊwɸə] 'training course', ['dʒəwɪə] 'round (n.)', etc. (phonemically /'dəuwə/ and /'dʒəwɪə/, respectively),
- (f) ['ɸɹwə] 'fur coat', ['ɸəlwə] 'a farmer's market, where farmers and grain merchants bring their goods for wholesale

marketing', etc. (phonemically /'fəruə/ and /'səluə/, respectively), and

(g) [dʒəw:] 'weather', [fa:w] 'Faw, a town in Basrah', etc. (phonemically /ǰəu/ and /fau/, respectively).

In addition, the phoneme /u/ may (as we have seen above) be realized as a consonant, i.e. [w]. In this case, /u/ may be doubled, e.g. /uuen/ 'and where?' and /'ǰəuuə/ 'indoors' (realized as [wwe:n] and ['dʒəwwə], respectively).

A final remark about the phoneme /u/: it is, like /i/, opposable to consonant phonemes due to its consonantal realization (viz. [w]), for example /'uələd/ 'boy' - /'bələd/ 'country'; /ueɪ/ 'distress (n.)' - /teɪ/ 'lamp-post', etc.

#### 9.34. The Phoneme /ɪ/ and its Realizations

The phonological identity of the phoneme /ɪ/ is established on the basis of the following distinctive oppositions:

1. ɪ/i = i/ɪ (see section 9.32 above).
2. ɪ/ʊ as in /'sɪbər/ 'lessons or warnings' - /'sʊbər/ 'he crossed over'; /'hɪlɪ/ 'a lady's ornaments' - /'hɪlʊ/ 'sweet or pretty'.

This phoneme is mostly realized as a non-nasalized, front, unrounded, short vowel of a second-degree aperture (i.e. [ɪ]) as in ['hɪlɪf] 'alliance'. In addition, it is realized as a



slightly nasalized vowel, (i.e. [ĩ] ) when occurring between two nasals or between a nasal and a non-nasal consonant, for example [mĩn] 'from', [ˈnĩsə] 'he forgot', etc. Furthermore, this phoneme never occurs word-initially nor can it be doubled since it is never realized consonantly.

### 9.35. The Phoneme /ʊ/ and its Realizations

The phonological identity of the phoneme /ʊ/ is established on the basis of the following distinctive oppositions:

1. ʊ/u = u/ʊ (see section 9.33 above).
2. ʊ/ɪ = ɪ/ʊ (see section 9.34 above).

This phoneme is mostly realized as a non-nasalized, back, rounded vowel of a second-degree aperture (i.e. [ʊ] ) as in [mʊɾ:] 'bitter'. In addition, this phoneme is, like all SIA vowel phonemes, realized as a slightly nasalized vowel (i.e. [ũ] ) when occurring between two nasals or between a nasal and a non-nasal consonant, for example [mũˈna:səbə] 'occasion', [nũʒ:] 'half', etc. Like /ɪ/, the phoneme /ʊ/ never occurs word-initially nor can it occur doubled since it is never realized consonantly.

### 9.36. The Phoneme /ə/ and its Realizations

The phonological identity of the phoneme /ə/ is established on the basis of the following distinctive oppositions:

1. ə/a as in /həd/ 'limit (n.)' - /had/ 'sharp'.

2. ə/ɪ as in /'sɛbrə/ 'tears' - /'sɪbrə/ 'lesson or warning'; /'sɛlə/ 'on' - /'sɛlɪ/ 'name of a boy'.

3. ə/ʊ as in /hɛr/ 'hot weather' - /hʊr/ 'free'; /'sɪlə/ 'it or he became higher' - /'sɪlʊ/ 'height'.

The phoneme /ə/ is mostly realized as a non-nasalized, central, unrounded, short vowel of a third-degree aperture (i.e. [ə]) as in [hɛl:] 'solution'. It is realized as a back-central, slightly lowered vowel (i.e. [ʌ]) when occurring between two non-nasal consonants, for example [bʌt:] 'ducks', [ʃʌf:] 'class', etc. In addition, this phoneme is, like all SIA vowel phonemes, realized as a slightly nasalized vowel (i.e. [ə̃] or [ʌ̃]) when occurring between two nasals or between a nasal and a non-nasal consonant, for example [mɛ̃n:] 'a measure of weight, approximately 24 kilograms', [mɛ̃l:] 'he became bored or fed up', [mʌ̃s:] 'he sucked', etc. Furthermore, /ə/, like /ɪ/ and /ʊ/, never occurs word-initially nor can it be doubled since it is never realized consonantly.

### 9.37. The Phoneme /e/ and its Realizations

The phonological identity of the phoneme /e/ is established on the basis of the following distinctive oppositions:

1. e/o as in /tɛf/ 'vision or phantasm' - /tɔf/ 'mud wall'.
2. e/i as in /uɛl/ 'distress' - /uɪl/ 'wheel'.

This phoneme is mostly realized as a non-nasalized, front, unrounded, long monophthong of a fourth-degree aperture (i.e. [e:] )

as in [t<sup>h</sup>e:l] 'lamp post'. However, it is optionally realized as a diphthong (viz.[e:ə] ) as in [t̥e:əɹ] 'bird' which is in free variation with [te:ɹ]; [we:əl] 'distress' which is in free variation with [we:l]; etc. Like other vowel phonemes that are usually realized as 'long' vowels, /e/ is realized longest when occurring in accented syllables, for example ['hɛ:wə] 'quinces'; cf. [hɛ·'wɑ:n] 'animal'. In addition, /e/ is, like all SIA vowel phonemes, realized as a slightly nasalized vowel (i.e.[ē:] or [ẽ:ə]) when occurring between two nasals or between a nasal consonant and a non-nasal consonant, for example [mnē:n] (or [mnē:ən] ) 'where from?', [mē:z] (or [mē:əz]) 'table', etc. A final remark about the phoneme /e/. Like /ɪ/, /ʊ/ and /ə/, it never occurs word-initially nor can it be doubled since it is never realized consonantly.

### 9.38. The Phoneme /o/ and its Realizations

The phonological identity of the phoneme /o/ is established on the basis of the following distinctive oppositions:

1. o/e = e/o (see section 9.37 above).
2. o/u as in /sog/ 'undignified (speech)' - /sug/ 'market'.

This phoneme is mostly realized as a non-nasalized, back, rounded, long monophthong of a fourth-degree aperture (i.e.[o:] ) as in [θo:ɹ] 'bull'. Like /e/, it is optionally realized as a diphthong (viz.[o:ə] ) as in [θœɹ] 'bull' which is in free variation with [θo:ɹ]; [d̥o:əɹ] 'role, turn' which is in free

variation with [d̥o:ɸ]; etc. Like other vowel phonemes that are usually realized as 'long' vowels, /o/ is realized longest when occurring in accented syllables, for example [ˈd̥o:ɸə] 'his turn'; cf. [b̥o·ˈja:t] 'empty cups, glasses, etc.'. In addition, /o/ is, like all SIA vowel phonemes, realized as a slightly nasalized vowel (i.e. [õ:] or [õ]) when occurring between two nasals or between a nasal and a non-nasal consonant, for example [nõ:m̥] (or [nõ̃m̥]) 'sleep (n.)'; [m̥õ:t] (or [m̥õ:ət]) 'death'; etc. Furthermore, /o/, like /ɪ/, /ʊ/, /ə/ and /e/, never occurs word-initially nor can it be doubled since it is never realized consonantly.

### 9.39. The Phoneme /a/ and its Realizations

The phonological identity of the phoneme /a/ is established on the basis of the following distinctive oppositions:

1. a/ə = ə/a (see section 9.36 above).
2. a/i as in /ˈsɑd/ 'he returned' - /ˈsiɑd/ 'religious feast'; /uədˈdɑ/ 'he sent it or him' - /uədˈdi/ 'send it or him! (sing. addressee)'.  
 3. a/u as in /ˈsɑd/ 'he returned' - /ˈsuɑd/ 'matchstick'; /uədˈdɑ/ 'he sent it or him' - /uədˈdu/ 'send it or him! (pl. addressee)'.

This phoneme is mostly realized as a non-nasalized, fairly front, unrounded, long vowel of a fifth- (i.e. maximum) degree aperture (i.e. [a:]) as in [ja:f] 'he saw'. It is also realized

as a fairly back long vowel with neutral lip posture (i.e. [ɑ:]) in the following contexts:

(a) After a ṃṃḥḥḥḥḥḥ consonant, for example ['ṭɑ:sə] 'drinking bowl', [ḍɑ:ʳ] 'it or he got lost', etc.

(b) Between a dorsal consonant and a ṃṃḥḥḥḥḥḥ consonant, for example ['kɑ:ḍuṃ] 'name of a boy', [gɑ:m] 'he stood up', [χɑ:ʃ:] 'special', and [ɣɑ:ʃ] 'it or he dived'.

Like other vowel phonemes that are usually realized as long vowels, /a/ is realized longest when occurring in accented syllables, for example [ʳi'ia:dʒ] 'treatment or remedy'; cf. [mḗsa·'dʒi:n] 'prisoners', etc. Furthermore, /a/ is, like all SIA vowel phonemes, realized as a slightly nasalized vowel (i.e. [ã:] or [ã:]) when occurring between two nasals or between a nasal consonant and a non-nasal consonant, for example [nã:m] 'he fell asleep'; [mã:ʃt] 'March'; etc. In addition, when /a/ is, like /i/ and /u/, opposed to phonemes that are realized as short vowels (i.e. /ɪ/, /ʊ/ and /ə/) in final position in polysyllabic words, it is always the case that the accentual patterns of the respective words are different; for example the accent falls on the final syllable in a word like /uəd'da/ 'he sent it or him' while it falls on the initial syllable in a word like /'uəddə/ 'he sent'. A final remark about the phoneme /a/: like /ɪ/, /ʊ/, /ə/, /e/ and /o/, it never occurs word-initially nor can it be doubled since it is never realized consonantly.

## Chapter Ten

DEFINITION AND CLASSIFICATION OF THE  
SIA PHONEMES

10.1. Introduction

The phoneme is, in this thesis, conceived of as "the sum of the phonologically relevant properties of a sound (Lautgebilde)" (Principles ..., p. 36). In other words, defining a given phoneme simply means listing its "relevant features"; a relevant feature being, as I have stated in section 3.2, the minimal sound property capable, in a given language, of distinguishing phonemes from each other, and consequently creating a semantic difference between the corresponding utterances. As we shall see later in this chapter, "un trait phonique peut être pertinent dans un cas et non pertinent dans un autre".<sup>(1)</sup> This chapter partly deals with defining the SIA consonant and vowel phonemes, so I shall present a list of the relevant features of each of the SIA phonemes. In addition, this chapter gives an account of the grouping of the SIA consonant phonemes on the basis of their relevant features, and also an account of the grouping of the SIA vowel phonemes on the basis of their relevant features. That is to say, the SIA phonemes that are characterized by the same relevant feature will be grouped together, for example all the SIA consonant phonemes that are characterized by the relevant feature "voiceless" form one group and those that are characterized by the relevant feature "voiced" form another group, and so on.

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(1) A. Martinet, La description phonologique ..., p. 39.

(A) The SIA Consonant Phonemes

10.2. Defining the Phoneme /p/

The phoneme /p/ is defined by the following set of relevant features:

1. "voiceless" as opposed to /b/ (hence p/b),
2. "labial" as opposed to /t/, /k/, etc. (hence p/t, p/k, etc.),
3. "non-nasal" as opposed to /m/ (hence p/m), and
4. "stop" as opposed to /f/ (hence p/f).

Generally speaking, the relevant feature "labial" designates an articulation which involves one lip (i.e. a labio-dental articulation) as in the case of /f/ (see section 10.4 below) or both lips (i.e. a bilabial articulation) as in the case of /p, b, m, ɱ/ (see also sections 10.3, 10.5 and 10.6 below); it also designates any other consonantal phonic characteristics which accompany such an articulation. That is to say, the labio-dental/bilabial distinction is phonologically irrelevant (i.e. non-distinctive) in SIA since the SIA phonological system does not have 'labio-dental' stops, for example, to be distinguished from /p/ and /b/ (which are always realized bilabially), nor does it have a 'bilabial' fricative to be distinguished from /f/ (which is always realized labio-dentally). Thus, the distinction between the "labial" phonemes is associated with the "voiceless"/"voiced" distinction (in the case of p/b), the "stop"/"fricative" distinction (in the case of p/f and b/f), the "non-nasal"/"nasal"

distinction (in the case of  $p/m, b/m$  and  $f/m$ ), or "the non- $\mu\upsilon f\acute{\alpha}x\acute{x}\acute{\alpha}m$ "/ $\mu\upsilon f\acute{\alpha}x\acute{x}\acute{\alpha}m$ " distinction (in the case of  $m/\acute{m}$ ). On the other hand, the relevant feature "stop" generally designates a plosive articulation (as in the case of  $/p/$ ) or an affricate articulation (in the case of  $/t͡s/$  and  $/t͡ʃ/$ ; see sections 10.25 and 10.26 below) as well as any other consonantal phonic characteristics which accompany such an articulation. Finally, the unaspirated/ aspirated and non- $\mu\upsilon f\acute{\alpha}x\acute{x}\acute{\alpha}m/\mu\upsilon f\acute{\alpha}x\acute{x}\acute{\alpha}m$  distinctions (i.e.  $[p]/[p^h]$  and  $[p]/[p̚]$ , respectively) are phonologically irrelevant to the phoneme  $/p/$ . In other words, the phonic features unaspirated, aspirated, non- $\mu\upsilon f\acute{\alpha}x\acute{x}\acute{\alpha}m$  and  $\mu\upsilon f\acute{\alpha}x\acute{x}\acute{\alpha}m$  are not to be designated as separate relevant features of  $/p/$  because (a) they do not characterize all the realizations of  $/p/$ , (b) they are not decisive for keeping  $/p/$  distinct from other SIA consonant phonemes, and (c) none of these  $p$ -sound distinctions results in a meaning difference.

### 10.3. Defining the Phoneme $/b/$ .

The phoneme  $/b/$  is defined by the following set of relevant features:

1. "voiced" as opposed to  $/p/$  (hence  $b/p$ ),
2. "labial" as opposed to  $/d/$ ,  $/g/$ , etc. (hence  $b/d$ ,  $b/g$ , etc.),
3. "non-nasal" as opposed to  $/m/$  (hence  $b/m$ ), and
4. "stop" as opposed to  $/f/$  (hence  $b/f$ ).

It is important to point out that the relevant feature



"voiced", which characterizes /b/ among the other SIA consonant phonemes, must not be equated with the phonic feature voiced alone since the former term is meant to be conventional and non-descriptive (see Martinet's La linguistique synchronique ..., p. 138), i.e. it does not necessarily imply glottal vibration alone. This explains the occurrence of a devoiced realization of /b/ in word-initial position (see section 9.3 above). In addition, what I have said in section 10.2 above about the relevant features "labial" and "stop" and the phonic features 'non-ḡʋfəxxəm' and 'ḡʋfəxxəm' (see section 10.2 above) holds true for /b/ as well.

#### 10.4. Defining the Phoneme /ɸ/.

The phoneme /ɸ/ is defined by the following set of relevant features:

1. "labial" as opposed to /ʃ/, /h/, /θ/, /ð/, etc. (hence ɸ/ʃ, ɸ/h, ɸ/θ, ɸ/ð, etc.),
2. "non-nasal" as opposed to /m/ (hence ɸ/m), and
3. "fricative" as opposed to /p/, /b/ (hence ɸ/p, ɸ/b).

The labio-dental articulation (which characterizes all the realizations of /ɸ/) and the other consonantal phonic characteristics which accompany it are designated as the relevant feature "labial" since the labio-dental/bilabial distinction is phonologically irrelevant in SIA (see section 10.2 above). In addition, the phonic feature voiceless, which characterizes all the realizations of /ɸ/, is regarded as phonologically non-distinctive since the phonological system of SIA does not have a

voiced "labial fricative" to be distinguished from /ɸ/, which is always realized as a voiceless fricative. This explains why /ɸ/ is directly opposed to /p/, which is distinctively "voiceless", in the same way as it is opposed to /b/, which is distinctively "voiced". Finally, the phonic features non-ṁʊfəxxəm and ṁʊfəxxəm which each characterize some of the realizations of /ɸ/, i.e. [ɸ] and [ɸ̥], respectively, in certain contexts (see section 9.4 above) are regarded as phonologically non-distinctive for the same reasons as I have mentioned in connexion with /p/ (see section 10.2 above).

#### 10.5 Defining the Phoneme /m/.

The phoneme /m/ is defined by the following set of relevant features:

1. "labial" as opposed to /n/ (hence m/n),
2. "non-ṁʊfəxxəm" as opposed to /ṁ/ (hence m/ṁ), and
3. "nasal" as opposed to /p/, /b/ and /ɸ/ (hence m/p, m/b and m/ɸ).

What I have said in section 10.2 above about the relevant feature "labial" holds true for /m/ as well. On the other hand, the phonic feature voiced, which characterizes all the realizations of /m/, is regarded as phonologically non-distinctive for the same reason as I have stated in section 10.4 above in connexion with the phonic feature voiceless, which characterizes all the realizations of /ɸ/, i.e. for the reason that the phonological system of SIA does not have a voiceless "labial nasal" to be distinguished from /m/, which is always realized as a voiced nasal. This explains why

/m/ is directly opposed to /p/, which is distinctively "voiceless", in the same way as it is opposed to /b/, which is distinctively "voiced".

#### 10.6. Defining the Phoneme /m/.

The phoneme /m/ is defined by the following set of relevant features:

1. "labial" as opposed to /t/, /ð/, /k/, etc. (hence m/t, m/ð, m/k, etc.), and
2. "mufəxxəm" as opposed to /m/ (hence m/m).

What I have said in section 10.2 above in connexion with the relevant feature "labial" holds true for the phoneme /m/ as well (see also sections 10.3-10.5 above). On the other hand, the phonic feature voiced, which characterizes all the realizations of /m/, is regarded as phonologically non-distinctive for the same reason I have given for regarding it as phonologically non-distinctive in connexion with /m/ (see section 10.5 above).

#### 10.7 Defining the Phoneme /t/.

The phoneme /t/ is defined by the following set of relevant features:

1. "voiceless" as opposed to /d/ (hence t/d),
2. "non-mufəxxəm" as opposed to /t/ (hence t/t),
3. "apical" as opposed to /p/, /k/, etc. (hence t/p, t/k, etc.),
4. "non-nasal" as opposed to /n/ (hence t/n), and
5. "stop" as opposed to /θ/ (hence t/θ).

As a relevant feature, "apical" generally designates an alveolar, post-alveolar, dental or interdental articulation and all the consonantal phonic characteristics that accompany it. The difference between the phonic feature alveolar, which characterizes some of the realizations of /t/ in most contexts, and the phonic feature dental, which characterizes other realizations of /t/ in certain contexts (see section 9.7 above), is regarded as phonologically non-distinctive. This is because (a) neither alveolar nor dental characterizes all the realizations of /t/, (b) neither feature is decisive for distinguishing /t/ from the other SIA consonant phonemes, and (c) the distinction between the alveolar and dental t- sounds (i.e. [t]/[t̪]) does not create a meaning difference. Since /t/ is always realized as a plosive, its relevant feature "stop" designates this plosive articulation. In addition, the presence and absence of aspiration (i.e. [tʰ] and [t] respectively) are regarded as phonologically non-distinctive for reasons similar to those for regarding the features 'alveolar' and 'dental' as phonologically non-distinctive (see further above).

#### 10.8 Defining the Phoneme /a/.

The phoneme /a/ is defined by the following set of relevant features:

1. "voiced" as opposed to /t/ (hence a/t),
2. "non-mufəxxəm" as opposed to /t̪/ (hence a/t̪),
3. "apical" as opposed to /b/, /g/, etc. (hence a/b, a/g, etc.),
4. "non-nasal" as opposed to /n/ (hence a/n), and
5. "stop" as opposed to /ð/ (hence a/ð).

What I have said about the relevant feature "voiced" in connexion with /b/ (see section 10.3 above) holds true for /d/. Furthermore, what I have said about the phonic features alveolar and dental in connexion with /t/ (see section 10.7 above) holds true for /d/ since /d/ is realized in the same way as /t/ in this respect. Finally, the phonic feature plosive, which characterizes all the realizations of /d/, is, like in section 10.7 above, designated as the relevant feature "stop".

#### 10.9: Defining the Phoneme /t/.

The phoneme /t/ is defined by the following set of relevant features:

1. "apical" as opposed to /m/, /l/, etc. (hence t/m, t/l, etc.),
2. "voiceless" as opposed to /d/ and /g/ (hence t/d and t/g), and
3. "stop" as opposed to /h/ (hence t/h).

The phonic feature post-alveolar, which characterizes all the realizations of /t/, is designated as the relevant feature "apical" (see 10.7 above). Furthermore, the phonic feature voiceless, which characterizes all the realizations of /t/, is regarded as phonologically non-distinctive for reasons similar to those mentioned in section 10.4 in connexion with /f/, which explains why /t/ is directly opposed to /d/ (which is distinctively "voiced") as well as /g/ (which is distinctively "voiced"). In addition, what I have said about the phonic feature plosive in connexion with /t/ and /d/ (see sections 10.7 and 10.8) holds true

for /t/. Finally, the phonic feature unaspirated, which characterizes all the realizations of /t/, is regarded as phonologically non-distinctive for a similar reason to that I have given for regarding the phonic feature voiceless in connexion with /f/ (see section 10.4 above) as phonologically non-distinctive.

#### 10.10. Defining the Phoneme /θ/.

The phoneme /θ/ is defined by the following set of relevant features:

1. "voiceless" as opposed to /ð/ (hence θ/ð),
2. "non-ɱʊfəxxəm" as opposed to /ð/ (hence θ/ð),
3. "apical" as opposed to /x/, /f/, /ʃ/, etc. (hence θ/x, θ/f, θ/ʃ, etc.),
4. "non-nasal" as opposed to /n/ (hence θ/n), and
5. "fricative" as opposed to /t/ (hence θ/t).

The phonic feature interdental, which characterizes all the realizations of /θ/, is designated as the relevant feature "apical" (see section 10.7 above).

#### 10.11. Defining the Phoneme /ð/.

The phoneme /ð/ is defined by the following set of relevant features:

1. "voiced" as opposed to /θ/ (hence ð/θ),
2. "non-ɱʊfəxxəm" as opposed to /ð/ (hence ð/ð),
3. "apical" as opposed to /ɣ/, /f/, /ʃ/, etc. (hence ð/ɣ, ð/f, ð/ʃ, etc.),

4. "non-nasal" as opposed to /n/ (hence  $\delta/n$ ), and
5. "fricative" as opposed to /a/ (hence  $\delta/a$ ).

What I have said about the phonic feature interdental in connexion with / $\theta$ / (see section 10.10 above) holds true for / $\delta$ /.

#### 10.12. Defining the Phoneme / $\delta$ /.

The phoneme / $\delta$ / is defined by the following set of relevant features:

1. "apical" as opposed to / $m$ /, / $l$ /, etc. (hence  $\delta/m$ ,  $\delta/l$ , etc.),
2. "non-ɱʊfæxxəm" as opposed to / $\theta$ / and / $\delta$ / (hence  $\delta/\theta$  and  $\delta/\delta$ ), and
3. "fricative" as opposed to / $t$ / (hence  $\delta/t$ ).

What I have said about the phonic feature interdental in connexion with / $\theta$ / and / $\delta$ / (see sections 10.10 and 10.11 above) holds true for / $\delta$ /, too. In addition, the phonic feature voiced, which characterizes all the realizations of / $\delta$ /, is regarded as phonologically non-distinctive for a similar reason to that I have mentioned in connexion with / $m$ / (see section 10.6 above). This explains why / $\delta$ / is directly opposed to / $\theta$ / (which is distinctively "voiceless") as well as / $\delta$ / (which is distinctively "voiced").

#### 10.13. Defining the Phoneme /k/.

The phoneme /k/ is defined by the following set of relevant features:

1. "voiceless" as opposed to /g/ (hence k/g),
2. "non-ɱʊfæxxəm" as opposed to / $k$ / (hence k/ $k$ ),

3. "dorsal" as opposed to /p/, /t/, etc. (hence k/p, k/t, etc.),
4. "non-nasal" as opposed to /n/ (hence k/n), and
5. "stop" as opposed to /x/ (hence k/x).

As a relevant feature, "dorsal" designates a velar, post-velar or uvular articulation and other consonantal phonic characteristics that accompany it. Some of the realizations of /k/ are characterized by a velar articulation in certain contexts and other realizations are characterized by a post-velar articulation in other contexts (see section 9.13 above), yet the difference between these phonic features is regarded as phonologically non-distinctive for reasons similar to those for regarding the difference between the phonic features alveolar and dental in connexion with /t/ and /d/ as phonologically non-distinctive (see sections 10.7 and 10.8 above). Furthermore, what I have said about the phonic feature plosive in connexion with /p/, /b/, /t/ and /d/ (see sections 10.2, 10.3, 10.7 and 10.8 above) holds true for /k/. Finally, what I have said about the unaspirated/aspirated distinction in connexion with /p/ and /t/ (see sections 10.2 and 10.7 above) holds true for /k/ as well.

#### 10.14 Defining the Phonème /g/.

The phoneme /g/ is defined by the following set of relevant features:

1. "voiced" as opposed to /k/ (hence g/k),
2. "non-mufəxxəm" as opposed to /k̥/ (hence g/k̥),
3. "dorsal" as opposed to /b/, /d/, etc. (hence g/b, g/d, etc.),



4. "non-nasal" as opposed to /n/ (hence g/n), and
5. "stop" as opposed to /ɣ/ (hence g/ɣ).

What I have said about the relevant feature "voiced" in connexion with /b/ and /d/ (see sections 10.3 and 10.8 above) holds true for /g/, too. As we have seen in section 9.14 above, /g/ may be realized as either a velar or a post-velar sound, but what I have said about these phonic features in connexion with /k/ (see section 10.13 above) holds true for /g/ as well. Finally, what I have said about the phonic feature plósive in connexion with /p/, /b/, /t/, /d/ and /k/ (see sections 10.2, 10.3, 10.7, 10.8 and 10.13 above) holds true for /g/, too.

#### 10.15. Defining the Phoneme /x/.

The phoneme /x/ is defined by the following set of relevant features:

1. "voiceless" as opposed to /ɣ/ (hence x/ɣ),
2. "non-ɱʊfəxxəm" as opposed to /ḳ/ (hence x/ḳ),
3. "dorsal" as opposed to /θ/, /ʃ/, etc. (hence x/θ, x/ʃ, etc.),
4. "non-nasal" as opposed to /n/ (hence x/n), and
5. "fricative" as opposed to /k/ (hence x/k).

The phonic features velar, which characterizes some of the realizations of /x/, and uvular, which characterizes other realizations of /x/ in other contexts (see section 9.15 above), are both designated as the one relevant feature "dorsal", i.e. the distinction between these two phonic features is regarded as phonologically non-distinctive for reasons similar to those for

regarding the distinction between the phonic features alveolar and dental in connexion with /t/ and /d/ (see sections 10.7 and 10.8 above) as phonologically non-distinctive.

#### 10.16. Defining the Phoneme /ɣ/.

The phoneme /ɣ/ is defined by the following set of relevant features:

1. "voiced" as opposed to /x/ (hence ɣ/x),
2. "non-ɱʊfəxxəm" as opposed to /k̟/ (hence ɣ/k̟),
3. "dorsal" as opposed to /ð/, /ʃ/, etc. (hence ɣ/ð, ɣ/ʃ, etc.),
4. "non-nasal" as opposed to /n/ (hence ɣ/n), and
5. "fricative" as opposed to /g/ (hence ɣ/g).

What I have said about the phonic features velar and uvular in connexion with /x/ (see section 10.15 above) holds true for /ɣ/ as well.

#### 10.17. Defining the Phoneme /k̟/.

The phoneme /k̟/ is defined by the following set of relevant features:

1. "dorsal" as opposed to /t̟/, /s̟/, etc. (hence k̟/t̟, k̟/s̟, etc.),
- and
2. "ɱʊfəxxəm" as opposed to /k/, /g/, /x/ and /ɣ/ (hence k̟/k, k̟/g, k̟/x and k̟/ɣ).

What I have said about the phonic feature voiceless in connexion with /ɛ/ (see section 10.4 above) holds true for /k̟/, i.e. it is regarded as phonologically non-distinctive. In addition,

the phonic feature plosive, which characterizes all the realizations of /k̤/, is regarded as phonologically non-distinctive since the phonological system of SIA does not have a fricative "dorsal ɱʊfəxxəm" to be distinguished from /k̤/ (which is always realized as a plosive sound). The above two notes explain why /k̤/ is directly opposed to /k/ (which is distinctively "voiceless") as well as /g/ (which is distinctively "voiced"), and, on the other hand, to /k/ (which is distinctively "stop") as well as /x/ (which is distinctively "fricative"). In addition, what I have said about the phonic feature unaspirated in connexion with /t̤/ (see section 10.9 above) holds true for /k̤/ as well. Finally, the phonic feature uvular, which characterizes all the realizations of /k̤/, is designated as the relevant feature "dorsal" (see section 10.13 above).

#### 10.18. Defining the Phoneme /n/.

The phoneme /n/ is defined by the following set of relevant features:

1. "non-labial" as opposed to /m/ (hence n/m), and
2. "nasal" as opposed to /t/, /d/, /θ/, /ð/, /k/, /g/, /x/ and /ɣ/ (hence n/t, n/d, n/θ, n/ð, n/k, n/g, n/x and n/ɣ).

As a relevant feature, "non-labial" designates any non-labial nasal articulation and all the consonantal phonic characteristics that accompany it. The non-labial phonic features alveolar, dental, velar and uvular do not by themselves constitute separate relevant features because (a) none of them characterizes all the realizatio

of /n/, and (b) the distinction between them is phonologically non-distinctive since it involves no meaning difference. In other words, these phonic features are designated as the one relevant feature "non-labial". In addition, the phonic feature voiced, which characterizes all the realizations of /n/, is regarded as phonologically non-distinctive for the same reason why I have regarded the phonic features voiceless and voiced in connexion with /ɛ/ and /m/ (see sections 10.4 and 10.5 above) as phonologically non-distinctive. This explains why /n/ is opposed to /t/, /θ/, /k/ and /x/ (which are all distinctively "voiceless") in the same way as it is opposed to /d/, /ð/, /g/ and /ɣ/ (which are all distinctively "voiced").

#### 10.19. Defining the Phoneme /ɾ/.

The phoneme /ɾ/ is defined by only one relevant feature, viz. "vibrant", which is sufficient to distinguish it from all the other SIA consonant phonemes, e.g. /l/, /n/, /ʃ/, etc. (hence ɾ/l, ɾ/n, ɾ/ʃ, etc.). This relevant feature designates any voiced, apical, flapped vibrant articulation: whether it be non-mufəxxəm or mufəxxəm, i.e. none of these phonic features by itself constitutes a separate relevant feature of /ɾ/ - they together are designated as the one relevant feature "vibrant". This is because none of these phonic features is possessed by all the realizations of /ɾ/ and, furthermore, the distinction between non-mufəxxəm and mufəxxəm or voiced and devoiced is phonologically non-distinctive since the mufəxxəm vibrant [ɾ], for example, cannot function in opposition to the non-mufəxxəm vibrant [ɾ]. This explains why /ɾ/ is opposable

to "non-ṃufəxxəmə" phonemes (e.g. /t/ and /d/), "non-ṃufəxxəmə" phonemes (e.g. /t/ and /d/), "voiced" phonemes (e.g. /b/ and /g/) and "voiceless" phonemes (e.g. /p/ and /k/).

#### 10.20. Defining the Phonème /l/.

The phonème /l/ is defined by the following set of relevant features:

1. "non-ṃufəxxəmə" as opposed to /l/ (hence 1/l), and
2. "lateral" as opposed to /r/, /n/, /ʃ/, etc. (hence 1/r, 1/n, 1/ʃ, etc.).

As a relevant feature, "lateral" designates any apical, (uni- or bi-) lateral articulation: whether it be voiced or devoiced. In other words, the phonic features apical, unilateral or bilateral, and voiced or devoiced do not by themselves constitute separate relevant features of /l/ - they are all designated as the one relevant feature "lateral" - for reasons similar to those for not regarding the phonic features non-ṃufəxxəmə, ṃufəxxəmə, voiced and devoiced in connexion with /r/ (see section 10.19 above) as separate relevant features. This explains why /l/ is opposable to "apical" phonemes (e.g. /t/ and /d/) as well as "dorsal" phonemes (e.g. /k/, /g/), etc.; and, on the other hand, to "voiceless" phonemes (e.g. /p/ and /č/) as well as "voiced" phonemes (e.g. /b/ and /ǵ/).

#### 10.21. Defining the Phonème /l/.

The phonème /l/ is defined by the following set of relevant features:

1. "ḡufəxxəm" as opposed to /l/ (hence l/l), and
2. "lateral" as opposed to /ʃ/, /ʒ/, etc. (hence l/ʃ, l/ʒ, etc.).

In connexion with /l/, the relevant feature "lateral" designates a voiced, apical (uni- or bi-) lateral articulation. In other words, the phonic feature voiced, which characterizes all the realizations of /l/ (see section 9.21 above), is regarded as phonologically non-distinctive for a similar reason to that I have mentioned in connexion with /m/ and /p/ (see sections 10.6 and 10.12 above), and the distinction between the phonic features apical and bilateral (or unilateral) is regarded as phonologically non-distinctive, i.e. they do not by themselves constitute separate relevant features for the same reasons as I have mentioned in connexion with /l/ (see section 10.20 above).

#### 10.22. Defining the Phoneme /s/.

The phoneme /s/ is defined by the following set of relevant features:

1. "voiceless" as opposed to /z/ (hence s/z),
2. "non-ḡufəxxəm" as opposed to /ʃ/ (hence s/ʃ), and
3. "hiss" as opposed to /h/, /r/, etc. (hence s/h, s/r, etc.).

As a relevant feature, "hiss" designates any apical fricative hissing articulation. In other words, the phonic features apical, fricative and hissing do not each constitute a relevant feature; they are all designated as the one relevant feature "hiss" for reasons similar to those I have mentioned in connexion with /l/ and the phonic features apical, unilateral or bilateral, and voiced

or devoiced (see section 10.20 above). This explains why /s/ is opposable to "apical" phonemes (e.g. /t/ and /θ/), "dorsal" phonemes (e.g. /k/ and /x/), etc.; and, on the other hand, to "fricative" phonemes (e.g. /θ/ and /x/) as well as "stop" phonemes (e.g. /t/ and /k/). Similarly, the 'non-nasal' phonic feature of /s/ is regarded as phonologically non-distinctive since the SIA phonological system does not have a nasal "hiss" phoneme to be distinguished from /s/. This explains why /s/ is opposable to "non-nasal" phonemes (e.g. /θ/ and /x/) as well as "nasal" phonemes (e.g. /n/ and /m/).

#### 10.23. Defining the Phoneme /z/.

The phoneme /z/ is defined by the following set of relevant features:

1. "voiced" as opposed to /s/ (hence z/s),
2. "non-ɱʌfəxxəm" as opposed to /ʃ/ (hence z/ʃ), and
3. "hiss" as opposed to /ʃ/, /ɣ/, etc. (hence z/ʃ, z/ɣ, etc.).

What I have said about the relevant feature "hiss" and the phonic features apical, fricative and non-nasal in connexion with /s/ (see section 10.22 above) holds true for /z/ as well. This explains why /z/ is opposable to /a/ and /ð/ as well as /g/ and /ɣ/; /ð/ and /ɣ/ as well as /a/ and /g/; and /ð/ and /ɣ/ as well as /n/ and /m/.

#### 10.24. Defining the Phoneme /ʃ/.

The phoneme /ʃ/ is defined by the following set of relevant features:

1. "mufəxxəm" as opposed to /s/ and /z/ (hence s/sand s/z), and
2. "hiss" as opposed to /t̪/, /ð/, etc. (hence s/t̪, s/ð, etc.).

What I have said about the relevant feature "hiss" and the phonic features apical, fricative and non-nasal in connexion with /s/ and /z/ (see sections 10.22 and 10.23 above) holds true for /ʃ/, too, which explains why /ʃ/ is opposable to "apical" phonemes (e.g. /ð/) as well as "dorsal" phonemes (e.g. /k/); "non-nasal" phonemes (e.g. /θ/) as well as "nasal" phonemes (e.g. /n/). In addition, the phonic feature voiceless, which characterizes all the realizations of /ʃ/, is regarded as phonologically non-distinctive for reasons similar to those I have mentioned in connexion with /f/ (see section 10.4 above). This explains why /ʃ/ is opposable to /s/ (which is distinctively "voiceless") in the same way as it is opposable to /z/ (which is distinctively "voiced"); see sections 10.22 and 10.23 above.

#### 10.25. Defining the Phoneme /č/.

The phoneme /č/ is defined by the following set of relevant features:

1. "voiceless" as opposed to /ǰ/ (hence č/ǰ),
2. "stop" as opposed to /ʃ/. (hence č/ʃ), and
3. "hush" as opposed to /p/, /t/, /k/, etc. (hence č/p, č/t, č/k, etc.).

As a relevant feature, "hush" generally designates any palato-alveolar hushing articulation irrespective of whether it is 'stop' or 'fricative'. In connexion with /č/, "hush" designates



a palato-alveolar, plosive hushing articulation, i.e. these phonic features are not regarded as separate relevant features but are instead designated as the one relevant feature "hush" for reasons similar to those for not regarding the phonic features apical, fricative and hissing in connexion with /s/ (and similarly /z/ and /ʒ/) as constituting separate relevant features (see sections 10.22-10.24 above). In addition, the phonic feature non-nasal, which characterizes all the realizations of /č/, is regarded as phonologically non-distinctive for a reason similar to that I have mentioned in connexion with /s/ (see section 10.22 above). The above remarks explain why /č/ is opposable to "labial" stops (e.g. /p/) as well as "apical" stops (e.g. /t/); and to "non-nasal" phonemes (e.g. /k/), as well as "nasal" phonemes (e.g. /n/). On the other hand, what I have said about the relevant feature "stop" in connexion with /p/ (see section 10.2 above) holds true for /č/ as well, i.e. in connexion with /č/ it designates an affricate articulation but since the SIA phonological system does not have a plosive "hush" phoneme to be distinguished from /č/, the affricate/plosive distinction is regarded as phonologically non-distinctive.

#### 10.26. Defining the Phoneme /ǰ/.

The phoneme /ǰ/ is defined by the following set of relevant features:

1. "voiced" as opposed to /č/ (hence ǰ/č),
2. "stop" as opposed to /ʃ/ (hence ǰ/ʃ), and
3. "hush" as opposed to /b/, /d/, /g/, etc. (hence ǰ/b, ǰ/d, ǰ/g, etc.).

What I have said about the relevant features "stop" and "hush" in connexion with /č/ (see section 10.25 above) holds true for /ǧ/, too, which explains why /ǧ/ is opposable to /b/ in the same way as it is opposable to /a/, etc. In addition, what I have said about the phonic feature non-nasal in connexion with /č/ also holds true for /ǧ/, which explains why /ǧ/ is opposable to /g/ in the same way as it is opposable to /n/.

#### 10.27. Defining the Phoneme /ʃ/.

The phoneme /ʃ/ is defined by the following set of relevant features:

1. "fricative" as opposed to /č/ and /ǧ/ (hence ʃ/č and ʃ/ǧ), and
2. "hush" as opposed to /ɸ/, /h/, /θ/, /ð/, etc. (hence ʃ/ɸ, ʃ/h, ʃ/θ, ʃ/ð, etc.).

In connexion with /ʃ/, the relevant feature "hush" designates a palato-alveolar hushing articulation but these two phonic features do not constitute separate relevant features for reasons similar to those I have mentioned in connexion with /č/ (see section 10.25 above), which explains why /ʃ/ is opposable to the "labial" phoneme /ɸ/ in the same way as it is opposable to the "glottal" phoneme /h/ (see section 10.31 below), etc. In addition, what I have said about the phonic feature non-nasal in connexion with /č/ and /ǧ/ (see sections 10.25 and 10.26 above) holds true for /ʃ/, too, which explains why /ʃ/ is opposable to the "non-nasal" phoneme /x/ in the same way as it is opposable to the "nasal" phoneme /n/. Similarly, what I have said about the phonic feature

voiceless in connexion with /ɛ/ (see section 10.4 above) holds true for /ʃ/, too, which explains why /ʃ/ is opposable to /ç/ as well as /ǰ/, /θ/ as well as /ð/, etc.

#### 10.28: Defining the Phoneme /h/.

The phoneme /h/ is defined by the following set of relevant features:

1. "voiceless" as opposed to /ʁ/ (hence h/ʁ), and
2. "pharyngeal" as opposed to /s/, etc. (hence h/s, etc.).

As a relevant feature, "pharyngeal" designates any pharyngeal fricative articulation. In other words, the phonic features pharyngeal and fricative do not constitute two separate relevant features since, in the pharyngeal zone of articulation there is no distinction between 'fricative' and 'stop' consonants; instead both pharyngeal and fricative are designated as one relevant feature which I have termed "pharyngeal". In addition, what I have said about the phonic feature non-nasal in connexion with /ʃ/, for example (see section 10.27 above), holds true for /h/, too. Similarly, what I have said about the non-mufəxxəm/mufəxxəm distinction in connexion with /ɛ/, for example (see section 10.4 above), holds true for /h/, too. The above remarks explain why /h/ is distinctively opposable to "fricative" phonemes (e.g. /ʃ/) as well as "stop" phonemes (e.g. /ç/); to "labial" phonemes (e.g. /p/) as well as "apical" phonemes (e.g. /θ/), etc.; to "non-nasal" phonemes (e.g. /k/) as well as "nasal" phonemes (e.g. /n/); and to "non-mufəxxəm" phonemes (e.g. /s/) as well as "mufəxxəm" phonemes (e.g. /ʃ/).

### 10.29. Defining the Phoneme /ʃ/.

The phoneme /ʃ/ is defined by the following set of relevant features:

1. "voiced" as opposed to /h/ (hence ʃ/h), and
2. "pharyngeal" as opposed to /z/, etc. (hence ʃ/z, etc.).

What I have said about the relevant feature "pharyngeal" and the phonic features non-nasal, non-mufəxxəm, and mufəxxəm in connexion with /h/ (see section 10.28 above) holds true for /ʃ/, too, which explains why /ʃ/ is distinctively opposable to /j/ as well as /ǰ/; to /b/ as well as /ð/; to /g/ as well as /n/; and to /z/ as well as /s/.

### 10.30. Defining the Phoneme /ʔ/.

The phoneme /ʔ/ is defined by the following set of relevant features:

1. "glottal" as opposed to /p/, /k/, /g/, etc. (hence ʔ/p, ʔ/k, ʔ/g, etc.), and
2. "stop" as opposed to /h/ (hence ʔ/h).

As a relevant feature, "glottal" designates a glottal (i.e. laryngeal) articulation and other consonantal phonic characteristics that accompany it. That is to say, the phonic features glottal, non-nasal and voiceless which characterize all the realizations of /ʔ/ are all designated as one relevant feature which I have termed "glottal"; they do not constitute separate relevant features. This explains why /ʔ/ is distinctively opposable to "labial" phonemes (e.g. /p/) as well as "apical" phonemes (e.g. /t/); to "non-nasal" phonemes (e.g. /k/) as well as "nasal" phonemes

(e.g. /n/); and to "voiceless" phonemes (e.g. /p/) as well as "voiced" phonemes (e.g. /b/). In addition, what I have said about the non-mufəxxəm/mufəxxəm distinction in connexion with /ʃ/, for example (see section 10.29 above), holds true for /ʔ/, too, which explains why /ʔ/ is distinctively opposable to "non-mufəxxəm" phonemes (e.g. /t/) in the same way as it is opposable to "mufəxxəm" phonemes (e.g. /t̚/).

### 10.31. Defining the Phoneme /h/.

The phoneme /h/ is defined by the following set of relevant features:

1. "glottal" as opposed to /ʃ/, /x/, /ɣ/, etc. (hence h/ʃ, h/x, h/ɣ, etc.), and
2. "fricative" as opposed to /ʔ/ (hence h/ʔ).

What I have said about the relevant feature "glottal" in connexion with /ʔ/ (see section 10.30 above) holds true for /h/, too, which explains why /h/ is distinctively opposable to /ʃ/ as well as /θ/; to /x/ as well as /n/; and to /θ/ as well as /ð/. Furthermore, what I have said about the non-mufəxxəm/mufəxxəm distinction in connexion with /ʔ/ also holds true for /h/, which explains why /h/ is distinctively opposable to /θ/ in the same way as it is opposable to /ð/. Finally, the phonic feature voiced, which characterizes some of the realizations of /h/ in certain contexts (see section 9.31 above), is regarded as phonologically non-distinctive since the distinction between the voiceless glottal fricative and the voiced glottal fricative is non-distinctive, i.e. it does not result in a meaning difference.

### 10.32. Classification of the SIA Consonant Phonemes.

On the basis of the above definitions of the SIA consonant phonemes in terms of relevant features, the SIA consonant phonemes are classified as follows:

(a) On the basis of their properties of localization, the SIA consonant phonemes are grouped into the following series:<sup>(1)</sup>

1. a "labial" series: /p, b, f, m, m̥/,
2. an "apical" series: /t, d, θ, ð, t̥, ð̥/,
3. a "dorsal" series: /k, g, x, γ, k̥/,
4. a "non-labial" series: /n/,
5. a "vibrant" series: /r/,
6. a "lateral" series: /l, l̥/,
7. a "hiss" series: /s, z, s̥/,
8. a "hush" series: /č, ǰ, ʃ/,
9. a "pharyngeal" series: /ħ, ʕ/ and
10. a "glottal" series: /ʔ, h/.

The above 'basic'<sup>(2)</sup> criterion of classification also applies to two 'secondary' series: a "non-ṁufəxxəm" series /m; t, d; θ, ð; k, g, x, l; s, z/ as opposed to a "ṁufəxxəm" series /m̥; t̥; ð̥; k̥; l̥; s̥/, respectively (the "non-ṁufəxxəm"/"ṁufəxxəm" distinction being phonologically irrelevant to the phonemes /p, b, f, n, r, č, ǰ, ʃ, ħ, ʕ, ʔ, h/).

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(1) A 'series of localization' is a phonological concept which must not be confused with the phonetic concept of 'place (or position) of articulation'; see Trubetzkoy's Principles ..., p. 124.

(2) I say 'basic' since "there is no language in which the properties of localization of the consonantal phonemes would be phonologically irrelevant" (ibid., p. 122).

(b) According to properties based on the manner of overcoming an obstruction, the SIA consonant phonemes are classified as follows:

1. a class of "stop" phonemes: /p, b; t; d; ṭ; k; g; č, ě; ?/ as opposed to a class of "fricative" phonemes: /f; θ; ð; ð̣; x; γ; ʃ; h/, respectively (the "stop"/"fricative" distinction being phonologically irrelevant to the phonemes /r, l, ḷ, s, z, ṣ, ħ, ʕ, m, ṃ, n, k/), and

2. a class of "voiceless" phonemes /p, t, θ, k, x, s, č, ħ/ as opposed to a class of "voiced" phonemes: /b, d, ð, g, γ, z, ě, ʕ/, respectively (the "voiceless"/"voiced" distinction being phonologically irrelevant to the phonemes /f, m, ṃ, ṭ, ð̣, ḳ, n, r, l, ḷ, ṣ, ʃ, ?, h/).

(c) On the basis of resonance properties, the SIA consonant phonemes are grouped into a class of "non-nasal" phonemes: /p, b, f; t, d, θ, ð, k, g, x, γ/ as opposed to a class of "nasal" phonemes: /m; n/, respectively (the "non-nasal"/"nasal" distinction being phonologically irrelevant to the phonemes /ṃ, ṭ, ð̣, ḳ, r, l, ḷ, s, z, ṣ, č, ě, ʃ, ħ, ʕ, ?, h/).

### (B) The SIA Vowel Phonemes

#### 10.33 Defining the Phoneme /i/.

The phoneme /i/ is defined by the following set of relevant features:

1. "front" as opposed to /u/ (hence i/u), and
2. "first-degree aperture" as opposed to /ɪ/, /e/, etc. (hence i/ɪ, i/e, etc.).

The relevant feature "front" designates any front, unrounded articulation. These two phonic features do not constitute two separate relevant features; they are both accounted for by one relevant feature which I have termed "front".<sup>(1)</sup> On the other hand, the relevant feature "first-degree aperture" designates a minimum (i.e. first) degree of opening accompanied by a long or short, vocalic or semivocalic articulation. These phonic features do not constitute separate relevant features but are accounted for by one relevant feature which I have termed "first-degree aperture".<sup>(2)</sup>

#### 10.34. Defining the Phonème /w/.

The phoneme /w/ is defined by the following set of relevant features:

1. "back" as opposed to /i/ (hence w/i), and
2. "first-degree aperture" as opposed to /u/, /o/, etc. (hence w/u, w/o, etc.).

The relevant feature "back" designates any back, rounded articulation. These two phonic features do not constitute two separate relevant features; they are both accounted for by one relevant feature which I have termed "back".<sup>(3)</sup> On the other hand,

(1) On the phonological non-distinctiveness (i.e. irrelevance) of vocalic lip position in SIA, see section 8.17 of this thesis. For Trubetzkoy's phonological treatment of the features front and unrounded, see Principles ..., p. 98.

(2) On the phonological non-distinctiveness of the vocalic/semivocalic and long/short distinctions in SIA, see sections 8.15 and 8.16 of this thesis.

(3) As we have seen in section 10.33 above (and prior to it in section 8.17, vocalic lip-position is phonologically non-distinctive in SIA, i.e. the feature rounded is phonologically non-distinctive. For Trubetzkoy's phonological treatment of the features back and rounded, see Principles ..., p. 98.



what I have said about the relevant feature "first-degree aperture" in connexion with /i/ (see section 10.33 above) holds true for /u/ as well.

#### 10.35. Defining the Phoneme /ɪ/.

The phoneme /ɪ/ is defined by the following set of relevant features:

1. "front" as opposed to /ʊ/ (hence ɪ/ʊ), and
2. "second-degree aperture" as opposed to /i/, /e/, etc. (hence ɪ/i, ɪ/e, etc.).

What I have said about the relevant feature "front" in connexion with /i/ (see section 10.33 above) holds true for /ɪ/ as well. On the other hand, the relevant feature "second-degree aperture" designates a second degree of opening accompanied by a short, vocalic articulation. These phonic features do not constitute separate relevant features, i.e. they are accounted for by one relevant feature which I have termed "second-degree aperture", since the SIA vowel system does not have a distinctive opposition between short and long or vocalic and semi-vocalic sounds as we have seen in sections 8.15, 8.16 and 10.33.

#### 10.36. Defining the Phoneme /ʊ/.

The phoneme /ʊ/ is defined by the following set of relevant features:

1. "back" as opposed to /ɪ/ (hence ʊ/ɪ), and
2. "second-degree aperture" as opposed to /u/, /o/, etc. (hence ʊ/u, ʊ/o, etc.).

What I have said about the relevant feature "back" in connexion with /u/ (see section 10.34 above) holds true for /ʊ/ as well. On the other hand, what I have said about the relevant feature "second-degree aperture" in connexion with /ɪ/ (see section 10.35 above) holds true for /ʊ/, too.

#### 10.37. Defining the Phoneme /ə/.

The phoneme /ə/ is defined by one and only one relevant feature, viz. "third-degree aperture" as opposed to /a/ etc. (hence ə/a, etc.). This relevant feature designates a third degree of opening accompanied by a short, back or central, unrounded articulation. These phonic features do not constitute separate relevant features, i.e. they are all accounted for by one relevant feature which I have termed "third-degree aperture" since the back/central distinction is not phonologically distinctive (it does not result in a meaning difference) and, furthermore, the features short and unrounded are also non-distinctive (as we have seen in section 10.33, for example). In addition, the "front"/"back" distinction is regarded as phonologically non-distinctive with regard to "third-degree aperture" since the SIA vowel system does not have a front vowel to be distinguished from /ə/. This explains why /ə/ is opposable to "front" phonemes (e.g. /ɪ/) in the same way as it is opposable to "back" phonemes (e.g. /ʊ/): the opposition being based solely on the "third-degree aperture"/"second-degree aperture" distinction, and so on.

10.38 Defining the Phoneme /e/.

The phoneme /e/ is defined by the following set of relevant features:

1. "front" as opposed to /o/ (hence e/o), and
2. "fourth-degree aperture" as opposed to /i/, /ɪ/, etc. (hence e/i, e/ɪ, etc.).

What I have said about the relevant feature "front" in connexion with /i/ and /ɪ/ (see sections 10.33 and 10.35 above) holds true for /e/ as well. On the other hand, the relevant feature "fourth-degree aperture" designates a fourth degree of opening accompanied by a long, monophthongal or diphthongal, vocalic articulation. These phonic features do not constitute separate relevant features; they are all accounted for by one relevant feature which I have termed "fourth-degree aperture". This is because the feature long is phonologically non-distinctive (see for example section 10.33 above) and, furthermore, the monophthongal/diphthongal distinction in connexion with /e/ (and similarly /o/) is phonologically non-distinctive (see section 8.18 above).

10.39. Defining the Phoneme /o/.

The phoneme /o/ is defined by the following set of relevant features:

1. "back" as opposed to /e/ (hence o/e), and
2. "fourth-degree aperture" as opposed to /u/, /ʊ/, etc. (hence o/u, o/ʊ, etc.).

What I have said about the relevant feature "back" in

connexion with /u/ and /ʊ/ (see sections 10.34 and 10.36 above) holds true for /o/ as well. On the other hand, what I have said about the relevant feature "fourth-degree aperture" in connexion with /e/ (see section 10.38 above) holds true for /o/ as well.

#### 10.40. Defining the Phoneme /a/.

The phoneme /a/ is defined by one and only one relevant feature, viz. "fifth-degree aperture" as opposed to /ə/, /i/, /u/, etc. (hence a/ə, a/i, a/u, etc.). This relevant feature designates a maximum (i.e. fifth) degree of opening accompanied by a front or back; long; unrounded vocalic articulation. These phonic features do not constitute separate relevant features, i.e. they are all accounted for by one relevant feature which I have termed "fifth-degree aperture". This is because the "front"/"back" distinction is phonologically non-distinctive with regard to "fifth-degree aperture" (since it does not result in a meaning difference) and, furthermore, the features long and unrounded are also phonologically non-distinctive (as we have seen in connexion with /i/ for example in section 10.33). This explains why /a/ is opposable to /i/ in the same way as it is opposable to /u/; the opposition being based solely on the "fifth-degree aperture"/"first-degree aperture" distinction, and so on.

#### 10.41. Classification of the SIA Vowel Phonemes.

On the basis of the above definitions of the SIA vowel

phonemes in terms of relevant features, the SIA vowel phonemes are classified as follows:

(a) On the basis of properties based on degree of aperture, the SIA vowel phonemes are classified into the following groups:

1. two phonemes of "first-degree aperture": /i, u/,
2. two phonemes of "second-degree aperture": /ɪ, ʊ/,
3. one phoneme of "third-degree aperture": /ə/,
4. two phonemes of "fourth-degree aperture": /e, o/, and
5. one phoneme of "fifth-degree aperture": /a/.

(b) On the basis of properties of localization (or timbre), the SIA vowel phonemes are grouped into a class of "front" phonemes /i, ɪ, e/ as opposed to a class of "back" phonemes /u, ʊ, o/; the "front"/"back" distinction being phonologically irrelevant to the phonemes /ə, a/.

## Chapter Eleven

TABULAR AND MULTI-DIMENSIONAL REPRESENTATIONS  
OF THE SIA PHONEMIC SYSTEM

11.1. Introduction

The present chapter carefully examines the relevant features of each of the SIA phonemes presented in Chapter Ten above so as to see the manner in which the SIA phonemes are related to each other. A careful examination of the relationships existing among the various SIA phonemes will show the way in which these phonemes should be grouped in tables or multi-dimensional diagrams. That is to say, those phonemes that are closest to each other in terms of relevant features (i.e. those phonemes that are usually distinguished from each other by only one pair of relevant features) should be grouped together, and so on. For example, the relevant features "voiceless, non-nasal, labial, stop" characterize the SIA phoneme /p/ (see section 10.2 further above), and the relevant features "voiced, non-nasal, labial, stop" characterize the SIA phoneme /b/ (see section 10.3 further above). This clearly shows that there is close phonological relation between /p/ and /b/ since they are distinguished from each other by only one pair of relevant features (viz. "voiceless" vs. "voiced", respectively) and so they should be grouped together. The SIA phoneme /r/, on the other hand, is characterized by only one relevant feature which I have termed "vibrant" (see section 10.19 further above), which shows that /r/ is very tenuously related to the other SIA phonemes (i.e. it does not form a series or an order with any of

the other SIA phonemes). The tabular and multi-dimensional diagrams to be presented in this chapter are an attempt to make the relationships existing among the various SIA phonemes visually clear. The two SIA sub-systems (viz. the 'consonant' system and the 'vowel' system) are dealt with separately because of the different nature of the set of relevant features one or more of which characterize any of the phonemes of each of them.

### 11.2. The SIA Consonant System.

A fundamental characteristic of the consonant system of SIA is that there is a distinctive opposition between some, if not all, of the 'mufəxxəmə' consonants and their 'non-mufəxxəmə' counterparts.<sup>(1)</sup> More specifically, the distinction between SIA [ṁ] and [m], for example, is phonemic (hence /ṁ/ and /m/, respectively), whereas the distinction between [ɽ] and [r] is phonetic and not phonemic (i.e. they are variants of one and the same phoneme, viz. /r/). In other words, the presence and absence of 'təxfim' in connexion with [ṁ] and [m] are phonologically distinctive and so they are designated as two relevant features, i.e. "mufəxxəmə" which characterizes /ṁ/ and "non-mufəxxəmə" which characterizes /m/, but in connexion with [ɽ] and [r] they are phonologically non-distinctive and so neither of them can be designated as a relevant feature of /r/. The consonant system of SIA can, therefore, be thought of as consisting of two major planes

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(1) For a detailed account of this matter, see section 8.6 further above in this thesis.

on one of which are situated those phonemes that are distinctively "non- $\mu f \acute{e} x x \acute{e} m \acute{e}$ " (e.g. /m/) as well as those phonemes that are neither distinctively 'non- $\mu f \acute{e} x x \acute{e} m \acute{e}$ ' nor distinctively ' $\mu f \acute{e} x x \acute{e} m \acute{e}$ ' (e.g. /r/), and on the other plane are situated those phonemes that are distinctively " $\mu f \acute{e} x x \acute{e} m \acute{e}$ " (e.g. /m/). That is to say, the former plane (i.e. the 'non- $\mu f \acute{e} x x \acute{e} m \acute{e}$ ' plane) accommodates the SIA consonant phonemes /p,b,f,m,t,d,θ,ð,k,g,x,γ,n,r,l,s,z,č,ǧ,ʃ,ħ,ʕ,ʔ,h/ (a total of 24 phonemes), and the latter plane (i.e. the " $\mu f \acute{e} x x \acute{e} m \acute{e}$ " plane) accommodates the SIA consonant phonemes / $\underline{m}$ , $\underline{t}$ , $\underline{d}$ , $\underline{k}$ , $\underline{l}$ , $\underline{s}$ /(a total of 6 phonemes).

Let us first consider the relationships existing among the phonemes of the 'non- $\mu f \acute{e} x x \acute{e} m \acute{e}$ ' plane. Some of these phonemes are related to each other on the basis of having one relevant feature in common (as in the case of /p,b,f,m/ which share the one relevant feature "labial"), and others are related to each other on the basis of having two or more relevant features in common (as in the case of /p,b/ which share three relevant features: "labial", "non-nasal" and "stop"). The maximum number of relevant features that two SIA consonant phonemes can have in common is 4, as in the case of /t,d/ which share the following relevant features: "apical", "non- $\mu f \acute{e} x x \acute{e} m \acute{e}$ ", "non-nasal" and "stop". This plane can further be thought of as consisting of three sub-planes: a plane of "stop" phonemes, a plane of "fricative" phonemes and in between can be positioned a plane of phonemes (to be conveniently called 'intermediate'<sup>(1)</sup>) which are neither distinctively "stop" nor distinctively

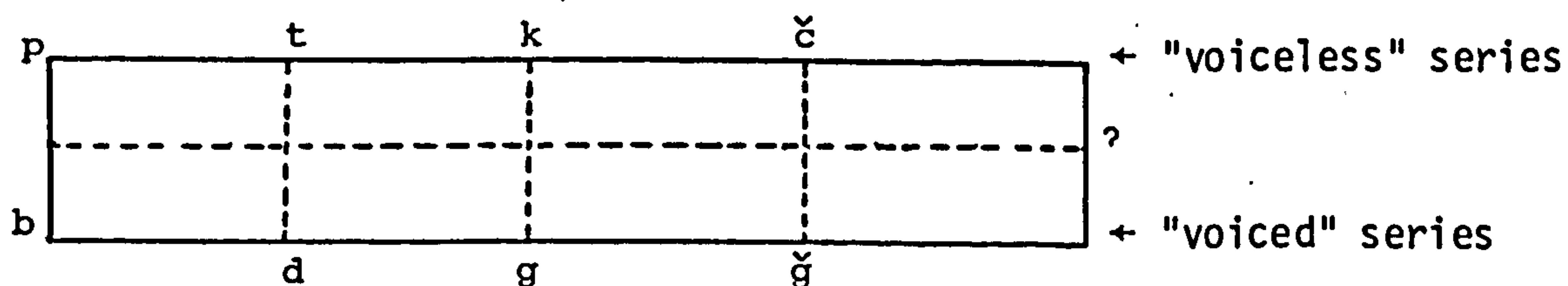
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(1) See further below.

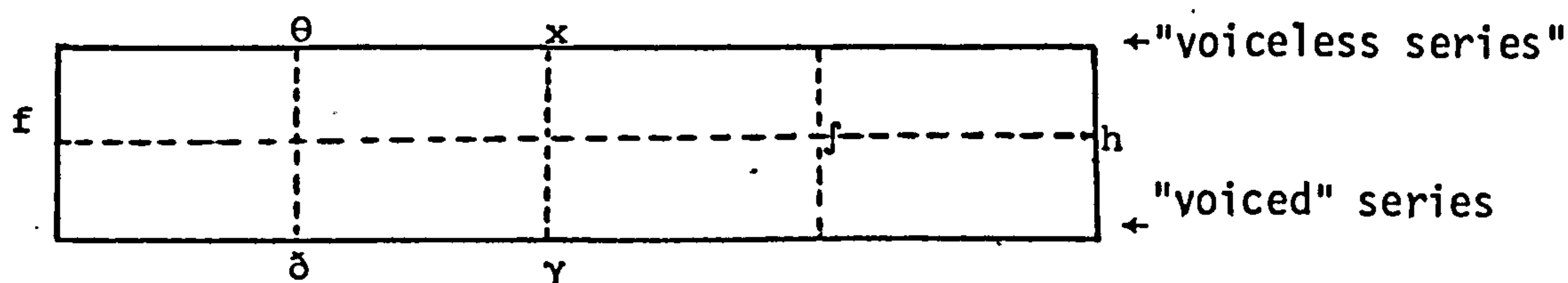


"fricative" phonemes.

The "stop" plane accommodates the consonant phonemes /p, b, t, d, k, g, č, ĝ, ʔ/ (a total of 9 phonemes). This plane is composed of a series of 4 distinctively "voiceless" phonemes (viz. /p, t, k, č/), a series of 4 distinctively "voiced" phonemes (viz. /b, d, g, ĝ/), and one phoneme (viz. /ʔ/) to which neither "voiceless" nor "voiced" is phonologically distinctive. Thus, the "stop" plane looks like this:

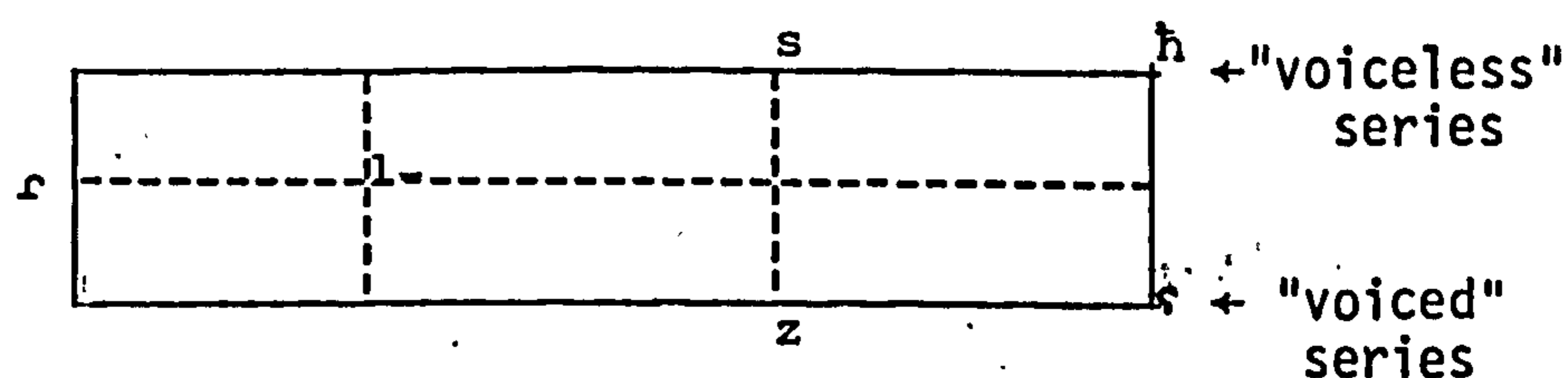


The "fricative" plane, on the other hand, accommodates the consonant phonemes /f, θ, ð, x, ɣ, ʃ, h/ (a total of 7 phonemes). This plane is composed of a series of 2 distinctively "voiceless" phonemes (viz. /θ, x/), a series of 2 distinctively "voiced" phonemes (viz. /ð, ɣ/), and a series of 3 phonemes (viz. /f, ʃ, h/) to which neither "voiceless" nor "voiced" is phonologically distinctive. Thus, the "fricative" plane looks like this:

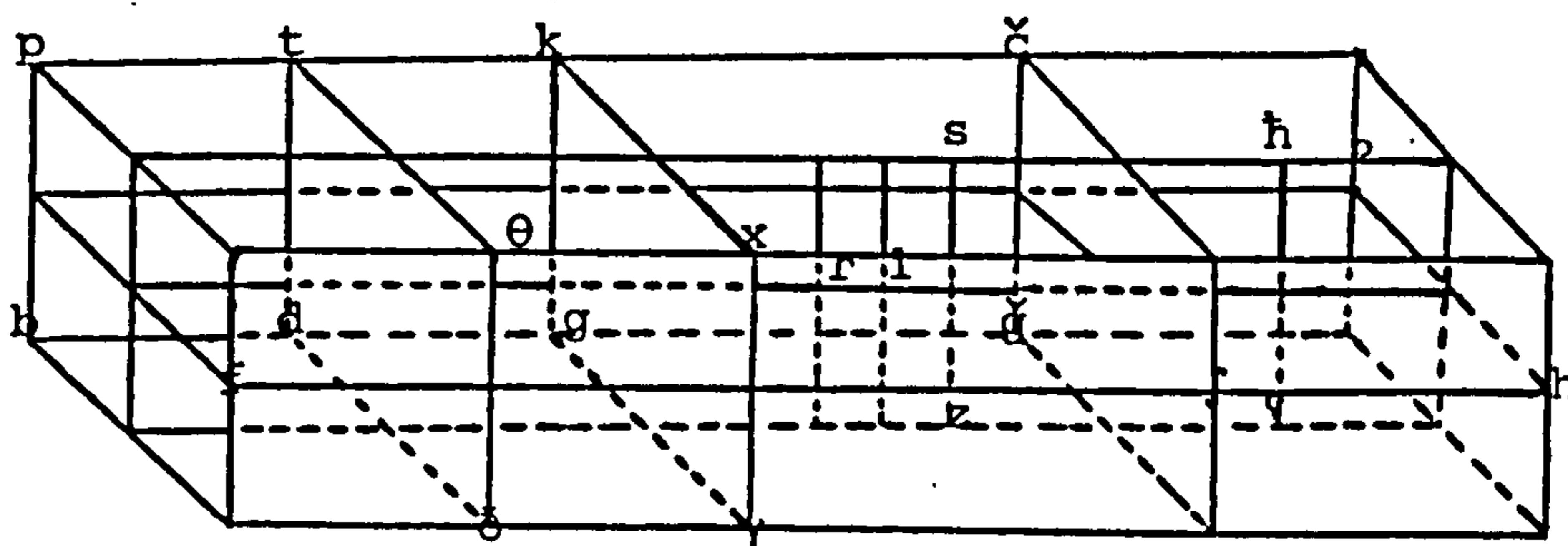


As regards the 'intermediate' plane, it accommodates the consonant phonemes /r, l, s, z, ʙ, ʕ/ (a total of 6 phonemes that are

neither distinctively "stops" nor distinctively "fricatives"). This plane is composed of a series of 2 distinctively "voiceless" phonemes (viz. /s, h/), a series of 2 distinctively "voiced" phonemes (viz. /z, r/), and a series of 2 phonemes (viz. /r, l/) to which neither "voiceless" nor "voiced" is phonologically distinctive. Thus, the intermediate plane looks like this:



In a multi-dimensional diagram, the above three sub-planes will look like this:



In addition to the above three sub-planes, the 'non-mufæxxæm' plane also contains a series of 2 "nasal" phonemes (viz. /m, n/). As the above multi-dimensional diagram shows, the distinction among the various phonemes within each of the above three sub-planes as well as the "nasal" series is made in two respects:

(a) If the respective phonemes (e.g. the "stop" phonemes

/č,ǰ/) share the same property of localization (i.e. "hush"), the distinction between them is based on the fact that one of them is "voiceless" (as in the case of /č/) and the other is "voiced" (as in the case of /ǰ/). In some cases (e.g. the "stop" phonemes /p,b/ which are both distinctively "labial"), the respective phonemes may share another relevant feature (viz. "non-nasal") and the distinction is still based on the relevant feature "voiceless" (in the case of /p/) as opposed to "voiced" (in the case of /b/). Furthermore, in other cases (e.g. the "fricative" phonemes /θ,ð/) the respective phonemes may even have three more relevant features in common (viz. "apical", "non-*мυφάκκωμ*" and "non-nasal") and the distinction between them is, yet again, based on the relevant feature "voiceless" (possessed by /θ/) as opposed to the relevant feature "voiced" (possessed by /ð/). In fewer cases, however, the respective phonemes only share the property of localization and the opposition between them is still maintained on the basis of the "voiceless"/"voiced" distinction, as in the case of the phonemes /ħ,ʕ/ which share only one relevant feature, viz. "pharyngeal", and the opposition between them is based on the fact that /ħ/ is distinctively "voiceless" while /ʕ/ is distinctively "voiced".

(b) If the respective phonemes share the relevant feature "voiceless" (as in the case of the "stop" phonemes /p,t/) or the relevant feature "voiced" (as in the case of the "stop" phonemes /b,d/), the distinction between the respective phonemes is based on different properties of localization (/p/, or similarly /b/,

being "labial" while /t/, or similarly /d/, being "apical"). In addition, the respective phonemes (i.e. /p,t/, or similarly /b,d/) have other relevant features in common (i.e. "non-nasal" and "stop"). In other cases, the relevant features common to the respective phonemes are greater in number still, as in the case of /t,k/ which share the relevant features "voiceless", "non-mufəxxəm", "non-nasal" and "stop". On the other hand, the only relevant feature that the phoneme /ʃ/, for example, shares with the other phonemes of the same plane (i.e. the "fricative" plane) is "fricative", which indicates that the opposition between /ʃ/ and any other phoneme of the same plane (e.g. /f/) is based solely on different properties of localization, i.e. on the "hush"/"labial" distinction. As regards the "nasal" series, the opposition between the two "nasal" phonemes is maintained purely on the basis of different properties of localization, i.e. the m/n opposition is based on the fact that /m/ is "labial" while /n/ is "non-labial".

To recapitulate, the distinction among the phonemes of the "stop" plane, the phonemes of the "fricative" plane, or the phonemes of the 'intermediate' plane is based on either different properties of localization or the "voiceless"/"voiced" opposition. In the case of the opposition between the phonemes of the "nasal" series (i.e. m/n), the distinction is based solely on different properties of localization; the "voiceless"/"voiced" distinction being phonologically non-distinctive to the "nasal" phonemes.

Not only are the phonemes of the same plane or series phonologically distinguished from each other, but they are also distinguished from the phonemes of the other planes or series. For example, a phoneme of the "stop" plane is placed in opposition to a phoneme of the "fricative" plane on the obvious basis of the "stop"/"fricative" distinction, e.g. the  $t/\theta$  opposition is based on the fact that  $/t/$  is distinctively "stop" while  $/\theta/$  is distinctively "fricative". In this connexion, it should be remembered that such oppositions are valid only among phonemes sharing the same property of localization, e.g. the "stop"/"fricative" distinction is the basis for the  $t/\theta$  opposition since both  $/t/$  and  $/\theta/$  share the same relevant feature of localization, viz. "apical". As regards the phonemes of the 'intermediate' plane, they are directly opposable to each other while they are indirectly opposable to the phonemes of the other planes or series.<sup>(1)</sup>

For example, the phoneme  $/r/$  (which belongs to the 'intermediate' plane) has only one relevant feature, viz. "vibrant" (see section 10.19 further above), by means of which it is placed in direct opposition to the phoneme  $/l/$  (which belongs to the same plane

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(1) The directness (or indirectness, as the case may be) of an opposition depends on the amount of difference (in terms of relevant features) between the members of the given opposition: when the difference is kept to the minimum (i.e. only one pair of relevant features), the respective opposition is said to be direct. Let us, for example, consider the  $p/b$  opposition. The phoneme  $/p/$  is distinctively characterized as being "voiceless, non-nasal, labial, stop" while the phoneme  $/b/$  is distinctively characterized as being "voiced, non-nasal, labial, stop". This clearly shows that the phonological difference between  $/p/$  and  $/b/$  is minimal, viz. "voiceless" vs. "voiced", respectively. Thus, I consider the  $p/b$  opposition to be direct. The  $t/r$  opposition, on the other hand,

and the same series; see further above), whereas it is in indirect opposition to the other phonemes of the same plane as well as those of the other planes or series. Where a "nasal" phoneme is involved, the other member of the respective opposition (be it distinctively "stop" or "fricative") is bound to share the same property of localization as that of the respective "nasal" phoneme, in which case the respective opposition is based on the "nasal"/"non-nasal"<sup>(1)</sup> distinction. For instance, the SIA oppositions m/p, m/b and m/ɸ are based on the fact that /m/ is distinctively "nasal" while /p/, /b/ and /ɸ/ are distinctively "non-nasal".

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contd. from previous page:- is considered to be indirect since the phonological difference between /t/ and /ɾ/ is great: the relevant features of /t/ are "voiceless, non-mufəxxəm, apical, non-nasal, stop" whereas "vibrant" is the only relevant feature of /ɾ/. In conclusion, only those oppositions that involve phonemes of the same series or order (on a series-and-order diagram, of course) are regarded as direct; all other oppositions being indirect.

(1) Alternatively, the term "oral" is used, though less frequently, for "non-nasal".



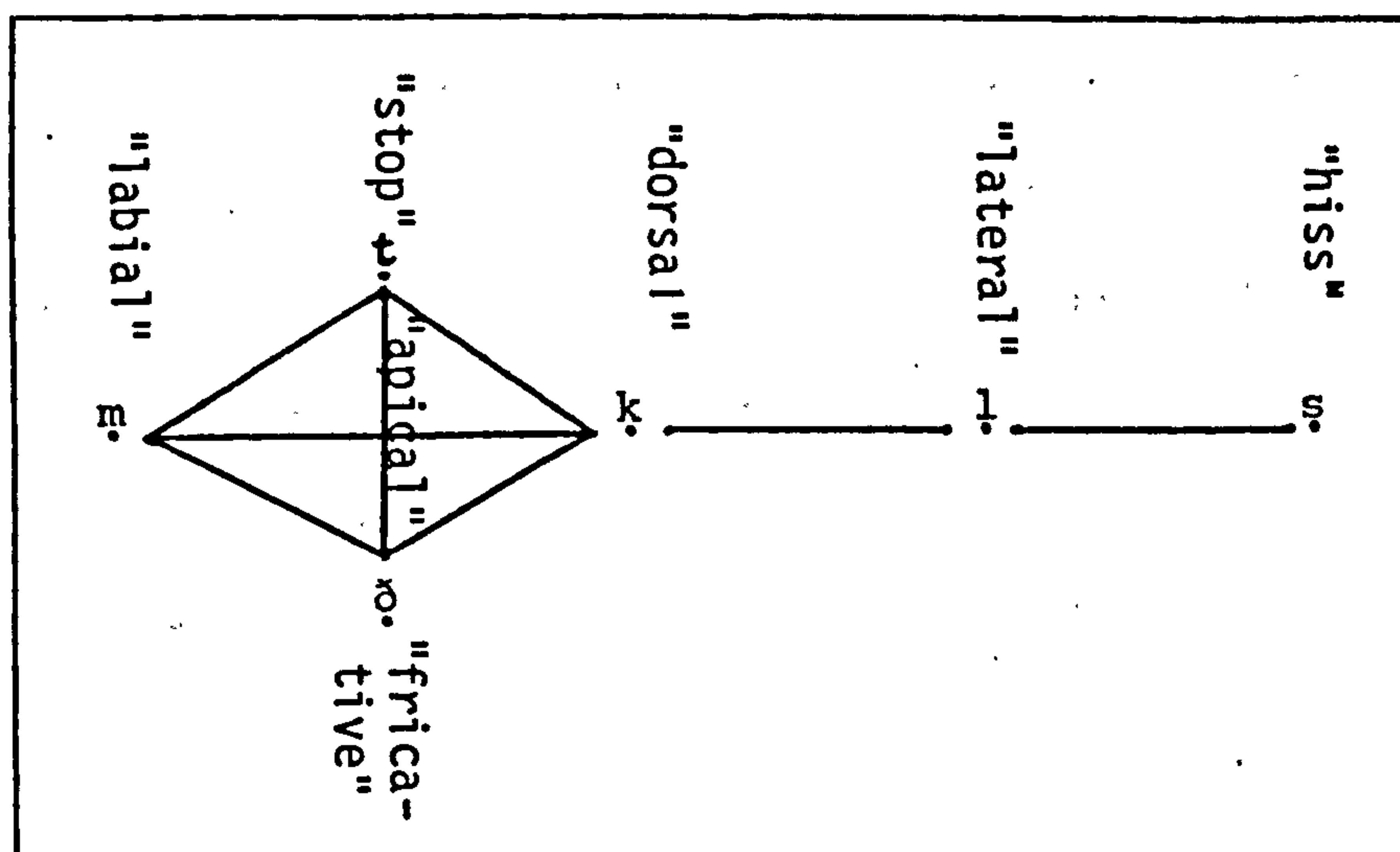
Let us now consider the relationships existing among the phonemes of the "ᵐᵒᶠᵉᵗᵗᵉᵐ" plane and subsequently try to show the nature of opposing the "ᵐᵒᶠᵉᵗᵗᵉᵐᵉ" phonemes to their respective "non-ᵐᵒᶠᵉᵗᵗᵉᵐᵉ" counterparts. The picture of the "ᵐᵒᶠᵉᵗᵗᵉᵐ" plane is easily imaginable due to the simplicity of the relationships existing among the phonemes of this plane. Generally speaking, a distinctively "ᵐᵒᶠᵉᵗᵗᵉᵐ" phoneme possesses two relevant features: one forms the basis of the relationship between the respective "ᵐᵒᶠᵉᵗᵗᵉᵐ" phoneme and the rest of the distinctively "ᵐᵒᶠᵉᵗᵗᵉᵐᵉ" phonemes, and the other forms the basis of the relationship between the respective "ᵐᵒᶠᵉᵗᵗᵉᵐ" phoneme and its "non-ᵐᵒᶠᵉᵗᵗᵉᵐ(ᵉ)" counterpart(s). The nature of the former relevant feature is that of a property of localization, for example the relationship between the "ᵐᵒᶠᵉᵗᵗᵉᵐᵉ" phonemes /ᵐ/ and /ᶠ/ is based on the distinction between the relevant feature "labial" (possessed by /ᵐ/) and the relevant feature "hiss" (possessed by /ᶠ/). Excepted from this is the relationship between the two "ᵐᵒᶠᵉᵗᵗᵉᵐᵉ" phonemes /ᵗ/ and /ᵗᵉ/; since it is the same property of localization (i.e. "apical") that is shared by these two phonemes, the opposition between the two phonemes is based on the fact that /ᵗ/ is distinctively "stop" while /ᵗᵉ/ is distinctively "fricative". Thus, the relationships existing among the phonemes of the "ᵐᵒᶠᵉᵗᵗᵉᵐ" plane may be summed up as follows:

(a) When "ᵐᵒᶠᵉᵗᵗᵉᵐ" is the only relevant feature common to the members of a given opposition, the distinction is maintained by virtue of their different properties of localization alone, e.g. the oppositions ᵐ/ᶠ, ᵗ/ᵗᵉ, etc.



(b) When the two members of a given opposition share the same property of localization as well as the relevant feature "mufəxxəm", they are nevertheless distinguished from each other by means of the "stop"/"fricative" distinction. This is very limited as it only applies to the opposition between the "mufəxxəmə" phonemes /t/ and /ð/; these two phonemes share the two relevant features "apical" and "mufəxxəm" and the opposition between them is based on the "stop"/"fricative" distinction.

The above relationships relating the phonemes of the "mufəxxəm" plane to each other may be represented by the following diagram:



A tabular representation of the relationships existing among the phonemes of the "mufəxxəm" plane will look like this:

	"labial"	"apical"	"dorsal"	"lateral"	"hiss"
"stop"	m	t	k	t	s
"fricative"		ð			

It should be pointed out that the "ṃṃfəxxəmə" phonemes /ṃ, k, l, s/ are opposable to the "ṃṃfəxxəm" phoneme /t/ (which is distinctively "stop") in the same way as they are opposable to the "ṃṃfəxxəm" phoneme /ð/ (which is distinctively "fricative"). This is because the "stop"/"fricative" distinction is phonologically non-distinctive to the "ṃṃfəxxəmə" phonemes /ṃ, k, l, s/. For example, the phonemic system of SIA does not have a "stop, labial, ṃṃfəxxəm" phoneme and a "fricative, labial, ṃṃfəxxəm" phoneme to be distinguished from each other, i.e. /ṃ/ is the only SIA "labial, ṃṃfəxxəm" phoneme.

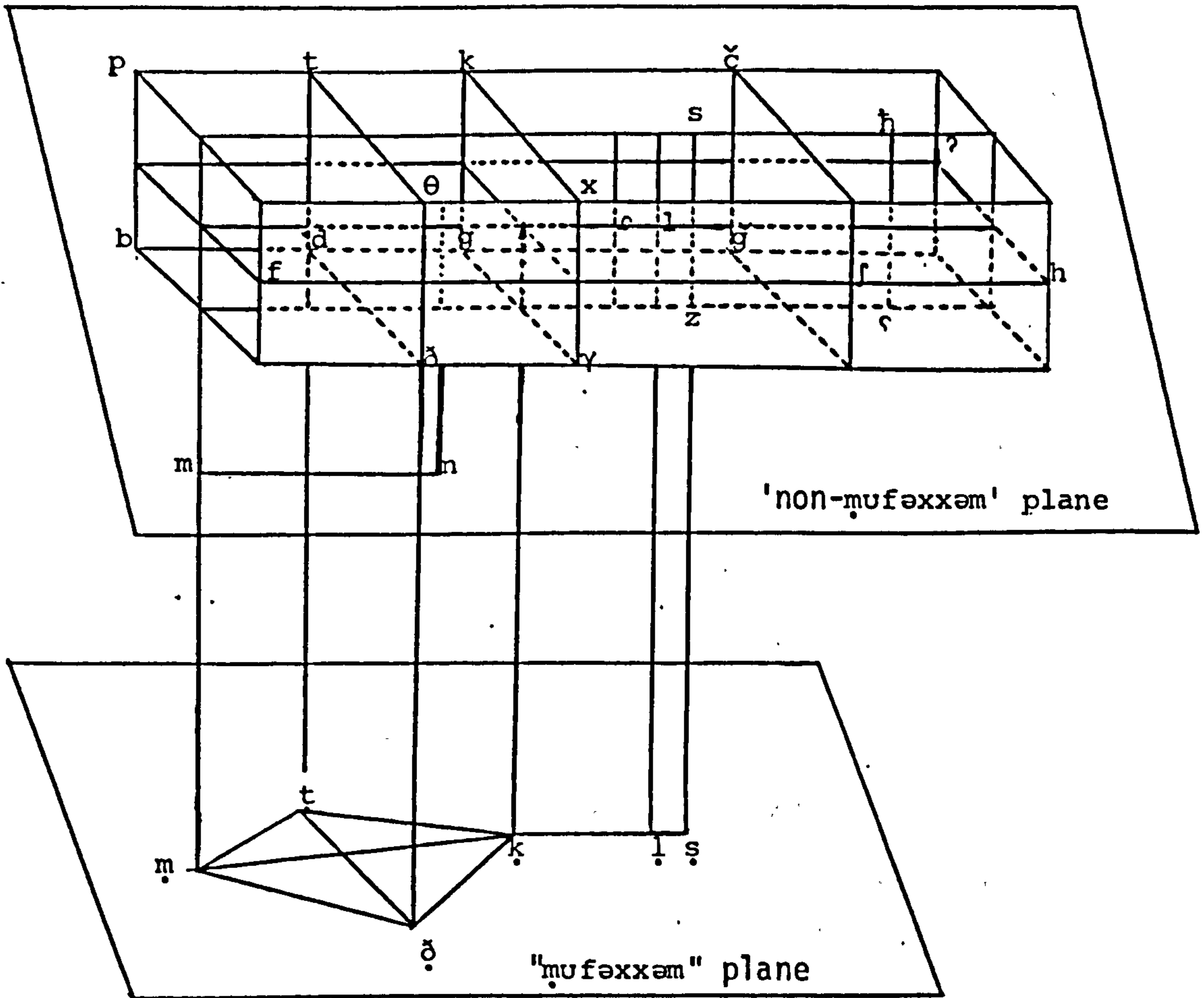
As regards the relationships existing among the phonemes of the "ṃṃfəxxəm" plane and those of the 'non-ṃṃfəxxəm' plane, it is very important to point out that, as is clear from the above table, the "ṃṃfəxxəm"/"non-ṃṃfəxxəm" phonemic distinction is only valid in the "labial", "apical", "dorsal", "lateral" and "hiss" orders. Direct opposition between the phonemes of the "ṃṃfəxxəm" plane and those of the 'non-ṃṃfəxxəm' plane is achieved only if we heed the following two warnings:

(a) We can directly oppose a phoneme of the "ṃṃfəxxəm" plane to a phoneme of the 'non-ṃṃfəxxəm' plane only if the two respective phonemes share the same property of localization, for example the ṃ/m opposition is direct since both /ṃ/ and /m/ are distinctively characterized as being "labial".

(b) A phoneme of the "ṃṃfəxxəm" plane is not necessarily directly opposable to all those phonemes of the 'non-ṃṃfəxxəm'

plane with which it shares the same property of localization. For example, the "mufəxxəm" phoneme /ṃ/ shares the relevant feature "labial" with the phonemes /m, f, p, b/ (which all belong to the 'non-mufəxxəm' plane), but it is only /ṃ/ that is distinctively characterized as being "non-mufəxxəm". This is because, on the one hand, /f/ is distinctively "fricative" and /p/ and /b/ are distinctively "stop" whereas, on the other hand, /ṃ/ and /m/ are neither distinctively "stop" nor distinctively "fricative", i.e. the phonological difference (in terms of relevant features) between /ṃ/ and /m/ is minimal compared with that between /ṃ/ and any of the phonemes /f/, /p/ and /b/. However, /ṃ/ is directly opposable to the phonemes /f, p, b/ since they not only belong to the same plane, viz. the 'non-mufəxxəm' plane, but they also share the same property of localization, viz. "labial". As we have seen before (e.g. in section 8.6), a "mufəxxəm" phoneme may have one or more distinctively "non-mufəxxəm" counterparts, i.e. ṃ/m; ṭ/t, d; ð/θ, ð; ḳ/k, g, x, γ; ḷ/l; and ṣ/s, z.

The relationships existing among the phonemes of the consonant system of SIA as a whole can be summed up by the following multi-dimensional diagram:



A tabular representation of the above multi-dimensional diagram will look like this:

	"labial"		"apical"		"dorsal"					"hush"			"glottal"	
	"stop"	"fricative"	"stop"	"fricative"	"stop"	"fricative"				"stop"	"fricative"		"pharyngeal"	"stop"
"voiceless"	p	f	t	θ	k	x	ɸ	l	s	ɸ	ɰ	ɸ	ʔ	h
"voiced"	b		d	ð	g	ɣ			z	ʃ	ʃ			
"nasal"	m		"non-labial"		n									
"mufəxxəm"	m		t	ð	k		l	s						

### 11.3. The SIA Vowel System.

Relationships among the phonemes of the vowel system of any language or dialect are generally less complicated than those existing among the phonemes of the consonant system of the same language or dialect. This is because there are usually fewer vowel phonemes than there are consonant phonemes in a given language or dialect; this is surely the case in SIA. The vowel phonemes of SIA are distinguished from each other on the following two bases:

(a) On the basis of different degrees of aperture, the vowel phonemes /i/ and /u/ are distinctively characterized by a "first-degree aperture"; the phonemes /ɪ/ and /ʊ/ by a "second-degree aperture"; the phoneme /ə/ by a "third-degree aperture"; the phonemes /e/ and /o/ by a fourth-degree aperture"; and finally the phonemes /a/ by a "fifth-degree aperture".

(b) On the basis of the "front"/"back" distinction, the phonemes /i/, /ɪ/ and /e/ are distinctively characterized by the relevant feature "front", and the phonemes /u/, /ʊ/ and /o/ are distinctively characterized by the relevant feature "back"; the phonemes /ə/ and /a/ being neither distinctively "front" nor distinctively "back".

Oppositions that are based on different degrees of aperture are regarded as direct only when the members of the respective opposition share, if phonologically possible, one of the two relevant features "front" and "back". For example, the opposition

between the vowel phoneme /i/ (which is distinctively characterized by a "first-degree aperture") and the vowel phoneme /ɪ/ (which is distinctively characterized by a "second-degree aperture") is said to be direct since both /i/ and /ɪ/ are distinctively characterized as being "front".. On the other hand, the vowel phonemes /ə/ and /a/ are distinctively characterized by only one relevant feature each, viz. "third-degree aperture" and "fifth-degree aperture", respectively. Therefore /ə/ and /a/ are opposable to each other directly while they are indirectly opposable to the other vowel phonemes of the SIA phonological system on the basis of different degrees of aperture. That is to say, the ə/a opposition is based on the "third-degree aperture"/"fifth-degree aperture" distinction; the a/u opposition is based on the "fifth-degree aperture"/"first-degree aperture" distinction, and so on.

On the other hand, oppositions that are based on the "front"/"back" distinction are regarded as direct only when the members of the respective opposition share the same relevant feature of degree of aperture (i.e. the case in the previous paragraph reversed). For example, the opposition between the vowel phoneme /i/ (which is distinctively characterized by the relevant feature "front") and the vowel phoneme /u/ (which is distinctively characterized by the relevant feature "back") is considered direct since /i/ and /u/ are both characterized by the same relevant feature of degree aperture, viz. "first-degree aperture". It follows that oppositions between /ə/ or /a/ and the other SIA vowel phonemes are regarded as indirect since neither /ə/ nor

/a/ is distinctively characterized by the relevant feature "front" or the relevant feature "back".

To recapitulate, if the members of a given vocalic opposition share the same relevant feature of degree of aperture, that opposition is said to be based on the "front"/"back" distinction, and if the relevant feature "front" or "back" is shared by the members of a given vocalic opposition, that opposition is said to be based on the distinction between the respective degrees of aperture.

The picture of the SIA vowel system can be described as follows: it contains a series of phonemes that are distinctively "front": /i,ɪ,e/; a series of phonemes that are distinctively "back": /u,ʊ,o/; and a series of phonemes that are neither distinctively "front" nor distinctively "back": /ə,a/. Each member of the first series represents one distinctive degree of aperture that is shared by its counterpart in the second series, e.g. /i/ is distinctively characterized by a "first-degree aperture" which is shared by /u/, and so on. Each member of the third series, on the other hand, represents one distinctive degree of aperture that is not shared by any other vowel phoneme of the SIA phonological system, e.g. the relevant feature "third-degree aperture" possessed by /ə/ is not shared by any SIA vowel phoneme. A conventional picture of the SIA vowel system looks like this (see section 8.16 further above):

i                      u  
   i                      u  
                     ə  
       e                o  
                     a

A tabular representation of the above vowel system will look like this:

	"front" "front"	"back" "back"
"first-degree aperture"	i	u
"second-degree aperture"	ɪ	ʊ
"third-degree aperture"	ə	
"fourth-degree aperture"	e	o
"fifth-degree aperture"	a	

A multi-dimensional representation of the vowel system of SIA is not possible since none of the SIA vowel phonemes has more than two relevant features, i.e. the SIA vowel system is purely two-dimensional. The above tabular representation of the SIA vowel system clearly shows the following direct relationships existing among the SIA vowel phonemes:

(1) an opposition between /i/ and /u/, i.e. i/u, based on the "front"/"back" distinction,

(2) an opposition between /i/ and /ɪ/, i.e. i/ɪ, based on the "first-degree aperture"/"second-degree aperture" distinction,



(3) an opposition between /i/ and /e/, i.e. i/e, based on the "first-degree aperture"/"fourth-degree aperture" distinction,

(4) an opposition between /ɪ/ and /ʊ/, i.e. ɪ/ʊ, based on the "front"/"back" distinction,

(5) an opposition between /ɪ/ and /e/, i.e. ɪ/e, based on the "second-degree aperture"/"fourth-degree aperture" distinction,

(6) an opposition between /ə/ and /a/, i.e. ə/a, based on the "third-degree aperture"/"fifth-degree aperture" distinction,

(7) an opposition between /e/ and /o/, i.e. e/o, based on the "front"/"back" distinction,

(8) an opposition between /u/ and /ʊ/, i.e. u/ʊ, based on the "first-degree aperture"/"second-degree aperture" distinction,

(9) an opposition between /u/ and /o/, i.e. u/o, based on the "first-degree aperture"/"fourth-degree aperture" distinction, and

(10) an opposition between /ʊ/ and /o/, i.e. ʊ/o, based on the "second-degree aperture"/"fourth-degree aperture" distinction.

The above are only those SIA vocalic oppositions that are regarded as direct, but phonologically speaking, any phoneme is opposable to every other phoneme of the system in some if not all contexts; a given opposition may be direct or indirect, as the case may be (see further above).

## Chapter Twelve

MEASURING 'FUNCTIONAL LOAD'12.1. Introduction.

As I have pointed out in section 4.14 above, measuring 'functional load' is a hard, complicated task which cannot possibly be a hundred per cent accurate. This is because 'functional load' is, in my view, the number of different distinctive oppositions that a given phoneme (or archiphoneme) can form with the other phonemes (or archiphonemes) of the given phonemic system, and the extent to which these distinctive oppositions are utilized in the various word contexts.<sup>(1)</sup> Therefore, I shall (as I have stated in section 4.14) restrict the present investigation to measuring the functional load of the SIA phonemes only. This will be done by means of calculating the total number of distinctive oppositions that a given SIA phoneme can enter into word-initially<sup>(2)</sup>, word-medially and word-finally in the phonemic system of SIA. However, a given consonant phoneme will be opposed to other consonant phonemes as well as the vowel phonemes /i/ and /u/ only, and a given vowel phoneme will only be opposed to other vowel phonemes (as well as consonant phonemes in the case of /i/ and /u/).<sup>(3)</sup>

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(1) For details of my views as well as other scholars' views on 'functional load' and my method of measuring it, see section 4.14 of this thesis.

(2) In this position, consonant clusters and 'mufəddədə' (i.e. doubled) phonemes will be used only occasionally.

(3) This is due to the fact that there is no opposition between vowel and consonant phonemes in SIA except between /i,u/ and consonant phonemes like /t/, /d/, etc.; /i/ and /u/ are, as we have seen in sections 9.32 and 9.33 above, the only SIA vowel phonemes that can be realized consonantally (i.e. as [j] and [w], respectively).

Then I shall change the resulting figures into percentages (for practical purposes) by applying the formula I have proposed on page 116, and finally list the SIA phonemes in descending order of functional load. It is to be remembered that I shall give only one example (i.e. minimal or quasi-minimal pair) to establish a given SIA phonological opposition in each of the three word positions specified above. It remains to be said that this chapter also investigates the word position where there occur more distinctive oppositions than in the other positions, i.e. the position of maximum differentiation.

#### (A) The SIA Consonant Phonemes

##### 12.2. The Opposability of /p/.

The opposability of the phoneme /p/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /p/ enters into the following distinctive oppositions:

1. p/b as in /'pərdə/ 'curtain' - /'bərdə/ 'cold spell of weather'.
2. p/f as in /'pərə/ 'the smallest unit of Turkish money' - /'fərə/ 'rat'.
3. p/m as in /'pia(d)ə/ 'on foot' - /'mia(t)ə/ 'dead'.
4. p/ṃ as in /'pačə/ 'calf of the leg' - /'ṃačə/ 'spade (suit in cards)'.
5. p/t as in /'pənkə/ 'air fan' - /'tənkə/ 'jerry can'.

6. p/d as in /'pəstə/ 'a kind of Iraqi folk song or verse' - /'dəstə/ 'dozen'.
7. p/ʧ as in /'pərdə/ 'curtain' - /'ʧərdə/ 'dismissal'.
8. p/θ as in /'pərə/ 'the smallest unit of Turkish money' - /'θərə/ 'his revenge'.
9. p/ð as in /pək/ 'even (adj.)' - /ðək/ 'that (one)'.
10. p/ð̥ as in /'pʊrət̥/ 'he disclosed inadvertently (a secret)' - /'ð̥ʊrət̥/ 'he broke wind'.
11. p/k as in /pek/ 'dram (of liquor)' - /kek/ 'cake'.
12. p/g as in /'pʊrət̥/ 'he disclosed inadvertently (a secret)' - /'gʊrət̥/ 'he chewed'.
13. p/x as in /paʃ/ 'bus' - /xaʃ/ 'special'.
14. p/ɣ as in /paʃ/ 'bus' - /ɣaʃ/ 'it or he dived'.
15. p/χ as in /paʃ/ 'bus' - /χaʃ/ 'narrator'.
16. p/n as in /'pafə/ 'pasha' - /'nafə/ 'he reached it or him'.
17. p/r as in /'paiə/ 'step (n.)' - /'raiə/ 'flag'.
18. p/s as in /pim/ 'pin joining a watch to its strap' - /sim/ 'thin metal rod'.
19. p/z as in /'pərə/ 'the smallest unit of Turkish money' - /'zərə/ 'he visited him'.
20. p/ʂ as in /paʃ/ 'bus' - /ʂaʃ/ 'sauce'.
21. p/č as in /'paiə/ 'step (n.)' - /'čaiə/ 'his tea'.
22. p/ǧ as in /'pərə/ 'the smallest unit of Turkish money' - /'ǧərə/ 'his neighbour'.
23. p/ʃ as in /'pəuʊəʃ/ 'he veiled (sb. or sth.)' - /'ʃəuʊəʃ/ 'he disturbed'.

24. p/h as in /'pačə/ 'calf of the leg' - /'hačə/ 'he spoke to (sb.)'.
25. p/s as in /'paɾə/ 'the smallest unit of Turkish money' - /'sɑɾə/ 'his disgrace'.
26. p/? as in /'puxtə/ 'mush' - /'?uxtə/ 'his sister'.
27. p/h as in /'paiə/ 'step (n.)' - /'haiə/ 'this (one)'.
28. p/i as in /'pɑɾdə/ 'curtain' - /'iɑɾdə/ 'yard'.
29. p/u as in /'pɑɾdə/ 'curtain' - /'uɑɾdə/ 'flower'.

(b) In word-medial position, /p/ enters into the following distinctive oppositions:

1. p/b as in /'ʃopə/ 'kerosene heater' - /'ʃobə/ 'his side or direction'.
2. p/f as in /'(p)ipɪ/ 'my barrel' - /'(f)ifɪ/ 'girl's name'.
3. p/m as in /'(p)ipɪ/ 'my barrel' - /'(m)imɪ/ 'girl's name'.
4. p/ṃ as in /'ʃopə/ 'kerosene heater' - /'ʃoṃə/ 'his fasting'.
5. p/t as in /'ʃopə/ 'kerosene heater' - /'ʃotə/ 'his voice'.
6. p/d as in /'ʃopə/ 'kerosene heater' - /'ʃodə/ 'soda water'.
7. p/ṭ as in /'ʃopə/ 'kerosene heater' - /'ʃoṭə/ 'his whip'.
8. p/ɣ as in /'ʃopə/ 'kerosene heater' - /'ʃoɣə/ 'present (n.)'.
9. p/n as in /'ʃopə/ 'kerosene heater' - /'ʃonə/ 'its or his rubbish'.
10. p/r as in /'ʃopə/ 'kerosene heater' - /'ʃorə/ 'his shape or appearance'.
11. p/l as in /'ʃopə/ 'kerosene heater' - /'ʃolə/ 'his key piece (in a game of marbles)'.
12. p/l̥ as in /'ʃopə/ 'kerosene heater' - /'ʃol̥ə/ 'his key piece (in a game of marbles)'.

(c) In word-final position, /p/ is not opposable to any of the SIA phonemes since it never occurs in this position.

Summary:

The phoneme /p/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, and 12 consonant phonemes word-medially; i.e. /p/ forms a total of 41 different distinctive oppositions within the SIA system of phonological oppositions.

12.3. The Opposability of /b/.

The opposability of the phoneme /b/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /b/ enters into the following distinctive oppositions:

1. b/p = p/b (see section 12.2 above).
2. b/f as in /bat/ 'he stayed overnight' - /fat/ 'he passed by'.
3. b/m as in /bat/ 'he stayed overnight' - /mat/ 'he died'.
4. b/ṃ as in /'bærɾə/ 'outside' - /'ṃærɾə/ 'once'.
5. b/t as in /'bazə/ 'cotton flannel' - /'tazə/ 'fresh'.
6. b/d as in /bar/ 'drinking bar' - /dar/ 'house'.
7. b/ṭ as in /bar/ 'drinking bar' - /ṭar/ 'it or he flew or vanished'.
8. b/θ as in /bar/ 'drinking bar' - /θar/ 'revenge (n.)'.
9. b/ð as in /'bærɾə/ 'outside' - /'ðærɾə/ 'atom'.
10. b/ḡ as in /bag/ 'he stole or robbed' - /ḡag/ 'he tasted'.
11. b/k as in /bas/ 'he kissed' - /kas/ 'cup'.

12. b/g as in /bas/ 'he kissed' - /gas/ 'he touched'.
13. b/x as in /bas/ 'he kissed' - /xas/ 'it went bad or spoiled'.
14. b/ɣ as in /bar/ 'drinking bar' - /ɣar/ 'he felt jealous'.
15. b/ɣ̣ as in /bas/ 'he kissed' - /ɣ̣as/ 'he measured'.
16. b/n as in /bas/ 'he kissed' - /nas/ 'people'.
17. b/r as in /bas/ 'he kissed' - /ras/ 'head'.
18. b/s as in /bar/ 'drinking bar' - /sar/ 'he walked'.
19. b/z as in /bar/ 'drinking bar' - /zar/ 'he visited'.
20. b/ʂ as in /bar/ 'drinking bar' - /ʂar/ 'he became'.
21. b/č as in /'barək/ 'he congratulated' - /'čarək/ 'quarter'.
22. b/ǧ as in /bar/ 'drinking bar' - /ǧar/ 'neighbour'.
23. b/ʃ as in /'barək/ 'he congratulated' - /'ʃarək/ 'he participated'.
24. b/ħ as in /bar/ 'drinking bar' - /ħar/ 'hot'.
25. b/ʕ as in /bar/ 'drinking bar' - /ʕar/ 'disgrace (n.)'
26. b/? as in /baʃ/ 'he kissed' - /ʔas/ 'ace (in a game of cards)'
27. b/h as in /'bənnə/ 'master brick-layer' - /'hənnə/ 'he congratulated'.
28. b/i as in /'bərdə/ 'cold spell of weather' - /'iərdə/ 'yard'.
29. b/u as in /'bərdə/ 'cold spell of weather' - /'uərdə/ 'flower'.

(b) In word-medial position, /p/ enters into the following distinctive oppositions:

1. b/p = p/b (see section 12.2 above).
2. b/f as in /'ǧɪbəl/ 'mountain' - /'ǧɪfəl/ 'he jumped with fright'.

3. b/m as in /'ǧɪbəl/ 'mountain' - /'ǧiməl/ 'camel'.
4. b/ṃ as in /'ʕubər/ 'he crossed over' - /'ʕuṃər/ 'boy's name'.
5. b/t as in /'ʂobə/ 'his side or direction' - /'ʂotə/ 'his voice'.
6. b/d as in /'ʂobə/ 'his side or direction' - /'ʂodə/ 'soda water'.
7. b/ṭ as in /ʕu'bʊr/ 'crossing over' - /ʕu'tʊr/ 'various kinds of perfumes'.
8. b/θ as in /'ʕɪbər/ 'lessons or warnings' - /'ʕɪθər/ 'he stumbled'.
9. b/ð as in /'ʕɪbər/ 'lessons or warnings' - /'ʕɪðər/ 'he excused'.
10. b/ð̣ as in /ʔə'biʕ/ 'I sell' - /ʔə'ð̣iʕ/ 'I get lost'.
11. b/k as in /'ʕubər/ 'he crossed over' - /'ʕukər/ 'lumps'.
12. b/g as in /'sɪbə/ 'he bothered greatly' - /'sigə/ 'he watered'.
13. b/x as in /'sɪbə/ 'he bothered greatly' - /'sɪxə/ 'he became generous'.
14. b/ɣ as in /'ʂobə/ 'his side or direction' - /'ʂoɣə/ 'present (n.)'.
15. b/ḳ as in /'ħəbɪl/ 'rope' - /'ħəḳɪl/ 'farm'.
16. b/n as in /ʕə'bid/ 'slaves' - /ʕə'nid/ 'stubborn'.
17. b/r as in /'sɪbə/ 'he bothered greatly' - /'sɪrə/ 'turn (n.)'.
18. b/l as in /'ʃɪbəs/ 'he became full' - /'ʃɪləs/ 'he took off (sth.)'.



19. b/l̥ as in /'s̥obə/ 'his side or direction' - /'s̥ol̥ə/  
'his key piece (in a game of marbles)'.
20. b/s as in /'ʔəbəd/ 'never' - /'ʔəsəd/ 'lion'.
21. b/z as in /'ǵɪbɪt/ 'I brought' - /'ǵɪzɪt/ 'I quit'.
22. b/ʂ as in /ʕu'bʊr/ 'crossing over' - /ʕu'ʂʊr/ 'ages'.
23. b/č as in /'ħɪbə/ 'he (i.e. a baby) crawled' - /'ħɪčə/  
'he talked'.
24. b/ǵ as in /'ʔubɾə/ 'needle' - /'ʔuǵɾə/ 'fare or wage'.
25. b/ʃ as in /'ʕəbrə/ 'tears' - /'ʕəʃɾə/ 'ten'.
26. b/ħ as in /ʔə'bɪd/ 'I exterminate' - /ʔə'ħɪd/ 'I  
deviate from'.
27. b/ʕ as in /ʔə'bɪd/ 'I exterminate' - /ʔə'ʕɪd/ 'I  
repeat'.
28. b/ʔ as in /'ɪɪbəs/ 'it became dry' - /'ɪɪʔəs/ 'he  
despaired'.
29. b/h as in /'sɪbə/ 'he bothered greatly' - /'sɪhə/  
'he was inattentive'.
30. b/i as in /ʔəx'bɑr/ 'news' - /ʔəx'ɪɑr/ 'honourable men'.
31. b/u as in /'rʊbə/ 'he grew up' - /'rʊuə/ 'it or he  
quenched the thirst'.

(c) In word-final position, /b/ is, like /p/, not opposable to any of the SIA phonemes since it never occurs in this position.

Summary:

The phoneme /b/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, and 29 consonant phonemes and

2 vowel phonemes word-medially, i.e. /b/ forms a total of 60 different distinctive oppositions within the SIA system of phonological oppositions.

#### 12.4. The Opposability of /ɛ/.

The opposability of the phoneme /ɛ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ɛ/ enters into the following distinctive oppositions:

1. ɛ/p = p/ɛ (see section 12.2 above).
2. ɛ/b = b/ɛ (see section 12.3 above).
3. ɛ/m as in /fiɪl/ 'elephant' - /miɪl/ 'mile'.
4. ɛ/ḿ as in /fæɾ/ 'he eloped' - /ḿæɾ/ 'he passed by'.
5. ɛ/t as in /fəɪl/ 'he untied' - /təɪl/ 'hill'.
6. ɛ/d as in /fæɾ/ 'rats' - /dæɾ/ 'house'.
7. ɛ/ṭ as in /fæɾ/ 'rats' - /ṭæɾ/ 'it or he flew'.
8. ɛ/θ as in /fæɾ/ 'rats' - /θæɾ/ 'revenge (n.)'.
9. ɛ/ð as in /fəɪl/ 'he untied' - /ðəɪl/ 'he humiliated'.
10. ɛ/ḷ as in /fəɪl/ 'he untied' - /ḷəɪl/ 'he stayed'.
11. ɛ/k as in /fas/ 'axe' - /kas/ 'cup'.
12. ɛ/g as in /fas/ 'axe' - /gas/ 'he touched'.
13. ɛ/x as in /fas/ 'axe' - /xas/ 'it went bad or spoiled'.
14. ɛ/ɣ as in /fæɾ/ 'rats' - /ɣæɾ/ 'he became jealous'.
15. ɛ/ḵ as in /fəɪl/ 'he untied' - /ḵəɪl/ 'it decreased'.
16. ɛ/n as in /fas/ 'axe' - /nas/ 'people'.
17. ɛ/r as in /fas/ 'axe' - /ras/ 'head'.

18. f/s as in /fɑr/ 'rats' - /sɑr/ 'he walked'.
19. f/z as in /fɑr/ 'rats' - /zɑr/ 'he visited'.
20. f/ʒ as in /fɑr/ 'rats' - /ʒɑr/ 'he became'.
21. f/č as in /'fɑrə/ 'rat' - /'čɑrə/ 'solution'.
22. f/ǵ as in /fɑr/ 'rats' - /ǵɑr/ 'neighbour'.
23. f/ʃ as in /fəl/ 'he untied' - /ʃəl/ 'he paralyzed'.
24. f/h as in /fəl/ 'he untied' - /həl/ 'solution'.
25. f/ʃ as in /fɑr/ 'rats' - /ʃɑr/ 'disgrace (n.)'.
26. f/? as in /fas/ 'axe' - /?as/ 'ace (in a game of cards)'.
27. f/h as in /fəl/ 'he untied' - /həl/ 'it or he came out'.
28. f/i as in /fas/ 'axe' - /ias/ 'privet'.
29. f/u as in /'fərdɪ/ 'odd (number)' - /'uərdɪ/ 'pink'.

(b) In word-medial position, /f/ enters into the following distinctive oppositions:

1. f/p = p/f (see section 12.2 above).
2. f/b = b/f (see section 12.3 above).
3. f/m as in /'hæflə/ 'party' - /'hæmlə/ 'campaign (n.)'.
4. f/ṃ as in /'hʊfrə/ 'hole in the ground' - /'hʊṃrə/ 'lip-stick'.
5. f/t as in /'sefə/ 'his sword' - /'setə/ 'his set'.
6. f/d as in /'ʃəfrə/ 'yellow (f. sing.)' - /'ʃədrə/ 'his chest'.
7. f/ṭ as in /'ʃəfrə/ 'hellow (f. sing.)' - /'ʃəṭrə/ 'slap (n.)'.
8. f/θ as in /'nɪfər/ 'he shied away' - /'nɪθər/ 'he scattered'.
9. f/ð as in /'nɪfər/ 'he shied away' - /'nɪðər/ 'he warned'.

10. f/ð as in /'nɪfəɹ/ 'he shied away' - /'nɪðəɹ/ 'he looked into'.
11. f/k as in /'nɪfəɹ/ 'he shied away' - /'nɪkəɹ/ 'he denied'.
12. f/g as in /'nɪfəɹ/ 'he shied away' - /'nɪgəɹ/ 'it or he tapped'.
13. f/x as in /'ʃəfɹə/ 'yellow (f. sing.)' - /'ʃəxɹə/ 'rock (n.)'.
14. f/ɣ as in /ʃə'fɪɹ/ 'whistling (n.)' - /ʃə'ɣɪɹ/ 'small'.
15. f/ɣ as in /'həflə/ 'party' - /'həkɫə/ 'his farm'.
16. f/n as in /'sɪfə/ 'he left it or him' - /'sɪnə/ 'he suffered'.
17. f/r as in /'sɪfə/ 'he left it or him' - /'sɪrə/ 'his disgrace'.
18. f/l as in /'sɪfə/ 'he left it or him' - /'sɪlə/ 'burden'.
19. f/ɹ as in /'ʃɪfəh/ 'he shook hands with' - /'ʃɪɹəh/ 'he made peace'.
20. f/s as in /'nɪfə/ 'he falsified' - /'nɪsə/ 'he forgot'.
21. f/z as in /'ʔəfɪəd/ 'more useful' - /'ʔəzɪəd/ 'more in quantity'.
22. f/ʃ as in /'sɪfə/ 'he forgave' - /'sɪʃə/ 'he disobeyed'.
23. f/č as in /'ntɪfə/ 'it ceased to be necessary' - /'ntɪčə/ 'he leant back'.
24. f/ǵ as in /'nɪfə/ 'he falsified' - /'nɪǵə/ 'he was safe'.
25. f/ɟ as in /'rɪfɪd/ 'resource' - /'rɪɟɪd/ 'mature man'.
26. f/h as in /ʔə'fɪd/ 'I make myself useful' - /ʔə'hɪd/ 'I deviate from'.

27.  $\text{f}/\text{r}$  as in  $/\text{r}\text{ə}'\text{fi}\text{d}/$  'I make myself useful' -  $/\text{r}\text{ə}'\text{si}\text{d}/$  'I repeat'.
28.  $\text{f}/\text{r}$  as in  $/\text{'s}\text{a}\text{f}\text{i}\text{l}/$  'ill-mannered' -  $/\text{'s}\text{a}^?\text{i}\text{l}/$  'person who asks (a question)'.
29.  $\text{f}/\text{h}$  as in  $/\text{'n}\text{i}\text{f}\text{ə}/$  'he falsified' -  $/\text{'n}\text{i}\text{h}\text{ə}/$  'he finished (sth.)'.
30.  $\text{f}/\text{i}$  as in  $/\text{'r}\text{a}\text{f}\text{i}\text{d}/$  'resource' -  $/\text{'r}\text{a}\text{i}\text{i}\text{d}/$  'willing (to do sth.)'.
31.  $\text{f}/\text{u}$  as in  $/\text{'t}\text{a}\text{f}\text{ə}/$  'tough guy' -  $/\text{'t}\text{a}\text{u}\text{ə}/$  'he sheltered'.

(c) In word-final position,  $/\text{f}/$  enters into the following distinctive oppositions:

1.  $\text{f}/\text{m}$  as in  $/\text{d}\text{ə}\text{f}/$  'tambourine' -  $/\text{d}\text{ə}\text{m}/$  'blood'.
2.  $\text{f}/\text{m}$  as in  $/\text{s}\text{ə}\text{f}/$  'class (n.)' -  $/\text{s}\text{ə}\text{m}/$  'handful'.
3.  $\text{f}/\text{t}$  as in  $/\text{g}\text{ə}\text{f}/$  'it became dry' -  $/\text{g}\text{ə}\text{t}/$  'clover'.
4.  $\text{f}/\text{d}$  as in  $/\text{g}\text{ə}\text{f}/$  'it became dry' -  $/\text{g}\text{ə}\text{d}/$  'he worked hard'.
5.  $\text{f}/\text{t}$  as in  $/\text{s}\text{a}\text{f}/$  'he left' -  $/\text{s}\text{a}\text{t}/$  'he screamed'.
6.  $\text{f}/\text{θ}$  as in  $/\text{r}\text{ə}\text{f}/$  'shelf' -  $/\text{r}\text{ə}\text{θ}/$  'worn-out'.
7.  $\text{f}/\text{ð}$  as in  $/\text{j}\text{a}\text{f}/$  'he saw' -  $/\text{j}\text{a}\text{ð}/$  'eccentric'.
8.  $\text{f}/\text{ð}$  as in  $/\text{x}\text{ə}\text{f}/$  'it became less concentrated' -  $/\text{x}\text{ə}\text{ð}/$  'he shook'.
9.  $\text{f}/\text{k}$  as in  $/\text{g}\text{ə}\text{f}/$  'it became dry' -  $/\text{g}\text{ə}\text{k}/$  'jug'.
10.  $\text{f}/\text{g}$  as in  $/\text{t}\text{a}\text{f}/$  'it floated' -  $/\text{t}\text{a}\text{g}/$  'arch'.
11.  $\text{f}/\text{x}$  as in  $/\text{j}\text{a}\text{f}/$  'he saw' -  $/\text{j}\text{a}\text{x}/$  'he became self-important or pompous'.
12.  $\text{f}/\text{ɣ}$  as in  $/\text{d}\text{ə}\text{f}/$  'tambourine' -  $/\text{d}\text{ə}\text{ɣ}/$  'he pinched (sb.) for attention'.

13.  $\text{f}/\text{k}$  as in  $/\text{saf}/$  'it wore out' -  $/\text{sak}/$  'he drove'.
14.  $\text{f}/\text{n}$  as in  $/\text{xəf}/$  'it became less concentrated' -  $/\text{xən}/$  'he spoke nasally'.
15.  $\text{f}/\text{r}$  as in  $/\text{ʳaf}/$  'he left' -  $/\text{ʳar}/$  'disgrace (n.)'.
16.  $\text{f}/\text{l}$  as in  $/\text{ʃaf}/$  'he saw' -  $/\text{ʃal}/$  'he moved out'.
17.  $\text{f}/\text{l̥}$  as in  $/\text{xəf}/$  'it became less concentrated' -  $/\text{xəl̥}/$  'vinegar'.
18.  $\text{f}/\text{s}$  as in  $/\text{xəf}/$  'it became less concentrated' -  $/\text{xəs}/$  'lettuce'.
19.  $\text{f}/\text{z}$  as in  $/\text{dəf}/$  'tambourine' -  $/\text{dəz}/$  'he sent'.
20.  $\text{f}/\text{ʒ}$  as in  $/\text{xəf}/$  'it became less concentrated' -  $/\text{xəʒ}/$  'he specified'.
21.  $\text{f}/\text{č}$  as in  $/\text{dəf}/$  'tambourine' -  $/\text{dəč}/$  'he packed'.
22.  $\text{f}/\text{ǰ}$  as in  $/\text{ʳaf}/$  'he left' -  $/\text{ʳaǰ}/$  'ivory'.
23.  $\text{f}/\text{j}$  as in  $/\text{ʳaf}/$  'he left' -  $/\text{ʳaj}/$  'he lived'.
24.  $\text{f}/\text{h}$  as in  $/\text{ʔaf}/$  'it floated' -  $/\text{ʔah}/$  'it or he dropped down'.
25.  $\text{f}/\text{ʳ}$  as in  $/\text{ʃaf}/$  'he saw' -  $/\text{ʃaʳ}/$  'it became widespread'.
26.  $\text{f}/\text{ʔ}$  as in  $/\text{saf}/$  'it wore out' -  $/\text{saʔ}/$  'it became worse'.
27.  $\text{f}/\text{h}$  as in  $/\text{ʃaf}/$  'he saw' -  $/\text{ʃah}/$  'Shah'.
28.  $\text{f}/\text{i}$  as in  $/\text{həf}/$  'he removed hair' -  $/\text{həi}/$  'alive'.
29.  $\text{f}/\text{u}$  as in  $/\text{ǰəf}/$  'it became dry' -  $/\text{ǰəu}/$  'weather'.

### Summary:

The phoneme  $/\text{f}/$  is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 29 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel

phonemes word-finally, i.e. /ɛ/ forms a total of 89 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.5. The Opposability of /m/.

The opposability of the phoneme /m/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /m/ enters into the following distinctive oppositions:

1. m/p = p/m (see section 12.2 above).
2. m/b = b/m (see section 12.3 above).
3. m/f = f/m (see section 12.4 above).
4. m/m̄ as in /m̄ei/ 'name of a girl' - /m̄ei/ 'water'.
5. m/t as in /'mɪtɪn/ 'thickness' - /'tɪtɪn/ 'tobacco'.
6. m/d as in /maɪ/ 'wealth' - /daɪ/ 'the name of the letter "d"'.  
"d"'.  
.
7. m/ɕ as in /'mɪɪə/ 'he filled up' - /'ɕɪɪə/ 'he plated'.
8. m/θ as in /'mæɪɪ/ 'spreading with a trowel' -  
/'θæɪɪ/ 'ice (n.)'.
9. m/ð as in /mæɪ/ 'he became tired or fed up' - /ðæɪ/  
'he humiliated'.
10. m/ð̣ as in /mæɪ/ 'he became tired or fed up' - /ð̣æɪ/  
'he stayed'.
11. m/k as in /'mɪɪə/ 'he filled up' - /'kɪɪə/ 'kidneys'.
12. m/g as in /maɪ/ 'wealth' - /gaɪ/ 'he said'.
13. m/x as in /maɪ/ 'wealth' - /xaɪ/ 'mole'.

14. m/γ as in /'mɪlə/ 'he filled up' - /'ɣɪlə/ 'it went up in price'.
15. m/κ as in /məl/ 'he became tired or fed up' - /κəl/ 'it decreased'.
16. m/n as in /maf/ 'green grain' - /naf/ 'he reached'.
17. m/r as in /məd/ 'he stretched' - /rəd/ 'reply (n.)'.
18. m/s as in /məd/ 'he stretched' - /səd/ 'dam'.
19. m/z as in /mal/ 'wealth' - /zal/ 'it disappeared'.
20. m/ʃ as in /məd/ 'he stretched' - /ʃəd/ 'he threw back'.
21. m/ʒ as in /mal/ 'wealth' - /ʒal/ 'he measured out'.
22. m/ɣ as in /məd/ 'he stretched' - /ɣəd/ 'he worked hard'.
23. m/ʃ as in /mal/ 'wealth' - /ʃal/ 'he moved out'.
24. m/h as in /məd/ 'he stretched' - /həd/ 'limit (n.)'.
25. m/ʃ as in /məd/ 'he stretched' - /ʃəd/ 'he counted'.
26. m/? as in /'mɪlə/ 'he filled up' - /'ʔɪlə/ 'to him'.
27. m/h as in /məd/ 'he stretched' - /həd/ 'he let go'.
28. m/i as in /məd/ 'he stretched' - /iəd/ 'hand (n.)'.
29. m/u as in /məd/ 'he stretched' - /uəd/ 'he liked'.

(b) In word-medial position, /m/ enters into the following distinctive oppositions:

1. m/p = p / m (see section 12.2 above).
2. m/b = b / m (see section 12.3 above).
3. m/f = f / m (see section 12.4 above).
4. m/m̄ as in /ʔə'man/ 'safe(ty)' - /ʔə'm̄an/ '(an expression of enthusiastic approval) great, wonderful!'.



5. m/t as in /ʃɪ'mad/ 'boy's name' - /ʃɪ'tad/ 'war material'.
6. m/d as in /'ɪməɪ/ 'he worked' - /'ɪdəɪ/ 'he was impartial toward'.
7. m/ɰ as in /'ɪməɪ/ 'he worked' - /'ɪɰəɪ/ 'it was out of order'.
8. m/θ as in /'ʔəməɪ/ 'hope (n.)' - /'ʔəθəɪ/ 'tamarisk'.
9. m/ð as in /'ʔə'man/ 'safe(ty)' - /'ʔə'dan/ 'Islamic call to prayer'.
10. m/ð̥ as in /ʃə'mid/ 'dean' - /ʃə'd̥id/ 'backer or supporter'.
11. m/k as in /'ʔəməɪ/ 'hope (n.)' - /'ʔəkəɪ/ 'he ate'.
12. m/g as in /'ɪməɪd/ 'deliberately' - /'ɪəgɪd/ 'narrow street'.
13. m/x as in /'ʔə'mɪɾ/ 'prince' - /'ʔə'xɪɾ/ 'final'.
14. m/ɣ as in /'ɾəməd/ 'inflammation of the eyes' - /'ɾəɣəd/ 'girl's name'.
15. m/k̥ as in /'ɪməɪd/ 'deliberately' - /'ɪək̥ɪd/ 'contract (n.)'.
16. m/n as in /sə'maʔ/ 'sky' - /sə'naʔ/ 'girl's name'.
17. m/ɾ as in /'ʃəɪs/ 'sun' - /'ʃəɾɪs/ 'ferocious'.
18. m/l as in /'ɪmə/ 'he became blind' - /'ɪlə/ 'it became higher'.
19. m/s as in /'ɪməɪ/ 'work (n.)' - /'ɪsəɪ/ 'honey'.
20. m/z as in /'ɪmə/ 'blindness' - /'ɪzə/ 'mourning ceremony'.
21. m/ʂ as in /'ɪmə/ 'blindness' - /'ɪʂə/ 'walking stick'.
22. m/č as in /'ħɪmə/ 'he warmed up' - /'ħɪčə/ 'he spoke'.
23. m/ǧ as in /'ʔəməɪ/ 'hope (n.)' - /'ʔəǧəɪ/ '(appointed) time of death'.

24. m/f as in /'səmə/ 'blindness' - /'səfə/ 'supper'.
25. m/h as in /'pɛ'mɪr/ 'prince' - /'pɛ'hɪr/ 'I become confused or undecided'.
26. m/s as in /'pɛ'mɪr/ 'prince' - /'pɛ'sɪr/ 'I lend (sth.)'.
27. m/? as in /'sɪməl/ 'unwanted (clothes)' - /'sɪ?əl/ 'he asked'.
28. m/h as in /'sɪməl/ 'unwanted (clothes)' - /'sɪhəl/ 'it became simple'.
29. m/i as in /'səmə/ 'blindness' - /'səiə/ 'sickness'.
30. m/u as in /'sɛ'lɑmə/ 'mark (n.)' - /'sɛ'lɑuə/ '(yearly) pay rise'.

(c) In word-final position, /m/ enters into the following distinctive oppositions:

1. m/f = f/m (see section 12.4 above).
2. m/m̩ as in /'hɪkəm/ 'maxims' - /'hɪkəm̩/ 'he ruled'.
3. m/t as in /fəm/ 'mouth' - /fət/ 'it or he broke'.
4. m/d as in /səm/ 'paternal uncle' - /səd/ 'he counted'.
5. m/t̩ as in /səm/ 'general (adj.)' - /sət̩/ 'he screamed'.
6. m/θ as in /γem/ 'clouds' - /γeθ/ 'rain (n.)'.
7. m/ð as in /ʃəm/ 'he smelled' - /ʃəð/ 'he deviated (from)'.
8. m/ð̩ as in /səm/ 'paternal uncle' - /səð̩/ 'it or he bit'.
9. m/k as in /ʃəm/ 'he smelled (sth.)' - /ʃək/ 'he doubted'.
10. m/g as in /ʃəm/ 'he smelled (sth.)' - /ʃəg/ 'tear (n.)'.
11. m/x as in /dəm/ 'it lasted' - /dax/ 'he was dizzy'.
12. m/ɣ as in /dəm/ 'blood' - /dəɣ/ 'he pinched (sb.) for attention'.

13. m/ɣ as in /sɑm/ 'poisonous' - /sɑɣ/ 'he drove'.
14. m/n as in /ʃəm/ 'he smelled (sth.)' - /ʃən/ 'he launched (an attack)'.
15. m/r as in /dɑm/ 'it lasted' - /dɑr/ 'house'.
16. m/l as in /ʃəm/ 'he smelled (sth.)' - /ʃəl/ 'he paralyzed'.
17. m/s as in /dɑm/ 'it lasted' - /dɑs/ 'he trod (on)'.
18. m/z as in /dəm/ 'blood' - /dəz/ 'he sent'.
19. m/ʃ as in /hə'fɪm/ 'women of a family' - /hə'fɪʃ/ 'dedicated'.
20. m/č as in /fəm/ 'mouth' - /fəč/ 'jawbone'.
21. m/ǰ as in /ʃəm/ 'general (adj.)' - /ʃaǰ/ 'ivory'.
22. m/j as in /ʃəm/ 'general (adj.)' - /ʃaʃ/ 'he lived'.
23. m/h as in /ʃəm/ 'he smelled (sth.)' - /ʃəh/ 'it became scarce'.
24. m/ʕ as in /ǰam/ 'glass (n.)' - /ǰaʕ/ 'he felt hungry'.
25. m/? as in /sɑm/ 'poisonous' - /sa?/ 'it became worse'.
26. m/h as in /ʃɑm/ 'Damascus, or, loosely, Syria' - /ʃah/ 'Shah'.
27. m/i as in /fəm/ 'mouth' - /fəi/ 'shade (n.)'.
28. m/u as in /'ʃɪləm/ 'he knew' - /'ʃɪləu/ 'they became higher'.

### Summary:

The phoneme /m/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 26 consonant phonemes and 2 vowel phonemes word-finally; i.e. /m/ forms a total of 87 different

distinctive oppositions within the SIA system of phonological oppositions.

### 12.6. The Opposability of /m̩/.

The opposability of the phoneme /m̩/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /m̩/ enters into the following distinctive oppositions:

1. m̩/p = p/m̩ (see section 12.2 above).
2. m̩/b = b/m̩ (see section 12.3 above).
3. m̩/f = f/m̩ (see section 12.4 above).
4. m̩/m = m/m̩ (see section 12.5 above).
5. m̩/t as in /'m̩ərə/ 'woman' - /'tərə/ 'or else'.
6. m̩/d as in /m̩ərə/ 'he passed by' - /dəərə/ 'it or he was productive'.
7. m̩/ʈ as in /m̩ug/ 'target hole in boys' marble games' - /ʈug/ 'arches'.
8. m̩/θ as in /'m̩əuuəl/ 'he financed' - /'θəuuəl/ 'he confused (sb.)'.
9. m̩/ð as in /'m̩ərə/ 'once' - /'ðərə/ 'atom'.
10. m̩/ð̩ as in /m̩ərə/ 'he passed by' - /ð̩ərə/ 'he harmed'.
11. m̩/k as in /'m̩ərə/ 'he let pass' - /'kərə/ 'he repeated'.
12. m̩/g as in /'m̩ərə/ 'he smashed' - /'gərə/ 'he held back'.
13. m̩/x as in /m̩ərə/ 'he passed by' - /xərə/ 'it leaked'.
14. m̩/ɣ as in /m̩əs/ 'he sucked' - /ɣəs/ 'he choked'.
15. m̩/ɕ as in /m̩ərə/ 'he passed by' - /ɕərə/ 'he confessed (a crime)'.

16.  $\text{ṁ}/n$  as in  $/\text{ṁ}\text{ə}\text{s}/$  'he sucked' -  $/n\text{ə}\text{s}/$  'text'.
17.  $\text{ṁ}/r$  as in  $/\text{ṁ}\text{ə}\text{s}/$  'he sucked' -  $/r\text{ə}\text{s}/$  'he compressed'.
18.  $\text{ṁ}/s$  as in  $/\text{ṁ}\text{u}\text{g}/$  'target hole in boys' marble games' -  $/s\text{u}\text{g}/$  'market'.
19.  $\text{ṁ}/z$  as in  $/\text{ṁ}\text{ə}\text{r}\text{g}\text{ə}/$  'stew' -  $/z\text{ə}\text{r}\text{g}\text{ə}/$  'blue (sing. f.)'.
20.  $\text{ṁ}/\text{ʃ}$  as in  $/\text{ṁ}\text{u}\text{r}\text{r}\text{ə}/$  'bitter (sing. f.)' -  $/\text{ʃ}\text{u}\text{r}\text{r}\text{ə}/$  'navel'.
21.  $\text{ṁ}/\text{č}$  as in  $/\text{ṁ}\text{ə}\text{r}\text{i}\text{d}/$  'crushing (n.)' -  $/\text{č}\text{ə}\text{r}\text{i}\text{d}/$  'cigar'.
22.  $\text{ṁ}/\text{ǵ}$  as in  $/\text{ṁ}\text{ə}\text{r}/$  'he passed by' -  $/\text{ǵ}\text{ə}\text{r}/$  'he pulled'.
23.  $\text{ṁ}/\text{ʃ}$  as in  $/\text{ṁ}\text{ə}\text{r}\text{r}\text{ə}/$  'once' -  $/\text{ʃ}\text{ə}\text{r}\text{r}\text{ə}/$  'his wickedness'.
24.  $\text{ṁ}/h$  as in  $/\text{ṁ}\text{ə}\text{r}/$  'he passed by' -  $/h\text{ə}\text{r}/$  'hot weather'.
25.  $\text{ṁ}/\text{ʕ}$  as in  $/\text{ṁ}\text{ə}\text{r}\text{g}\text{ə}/$  'stew' -  $/\text{ʕ}\text{ə}\text{r}\text{g}\text{ə}/$  'period of sweating'.
26.  $\text{ṁ}/\text{ʔ}$  as in  $/\text{ṁ}\text{ə}\text{r}\text{r}\text{ə}\text{x}/$  'he massaged' -  $/\text{ʔ}\text{ə}\text{r}\text{r}\text{ə}\text{x}/$  'he affixed the date to'.
27.  $\text{ṁ}/h$  as in  $/\text{ṁ}\text{ə}\text{u}\text{u}\text{ə}\text{l}/$  'he financed' -  $/h\text{ə}\text{u}\text{u}\text{ə}\text{l}/$  'he exaggerated'.
28.  $\text{ṁ}/i$  as in  $/\text{ṁ}\text{a}\text{i}/$  'water' -  $/i\text{a}\text{i}/$  'spring (n.)'.
29.  $\text{ṁ}/u$  as in  $/\text{ṁ}\text{ə}\text{r}\text{ə}\text{g}/$  'stew' -  $/u\text{ə}\text{r}\text{ə}\text{g}/$  'leaves'.

(b) In word-medial position,  $/\text{ṁ}/$  enters into the following distinctive oppositions:

1.  $\text{ṁ}/p = p/\text{ṁ}$  (see section 12.2 above).
2.  $\text{ṁ}/b = b/\text{ṁ}$  (see section 12.3 above).
3.  $\text{ṁ}/\text{ɸ} = \text{ɸ}/\text{ṁ}$  (see section 12.4 above).
4.  $\text{ṁ}/m = m/\text{ṁ}$  (see section 12.5 above).
5.  $\text{ṁ}/t$  as in  $/\text{ṁ}\text{ə}\text{ṁ}\text{ə}/$  'his fasting' -  $/\text{ṁ}\text{ə}\text{t}\text{ə}/$  'his voice'.
6.  $\text{ṁ}/d$  as in  $/\text{ṁ}\text{ə}\text{ṁ}\text{ə}/$  'his fasting' -  $/\text{ṁ}\text{ə}\text{d}\text{ə}/$  'soda water'.
7.  $\text{ṁ}/\text{t}$  as in  $/\text{ṁ}\text{ə}\text{ṁ}\text{ə}\text{ṁ}\text{ə}/$  'emirates' -  $/\text{ṁ}\text{ə}\text{ṁ}\text{ə}\text{ṁ}\text{ə}/$  'frames'.

8. ṃ/θ as in /'xuṃrə/ 'fermenting agent' - /'xuθrə/ 'curdling agent'.
9. ṃ/ð as in /'ʕuṃur/ 'age' - /'ʕuður/ 'excuse (n.)'.
10. ṃ/ð̣ as in /'xuṃrə/ 'fermenting agent' - /'xuð̣rə/ 'vegetables'.
11. ṃ/k as in /'ʕuṃər/ 'boy's name' - /'ʕukər/ 'bumps'.
12. ṃ/g as in /'buṃə/ 'owl' - /'bugə/ 'steal it!'.
13. ṃ/x as in /'ʔuṃər/ 'he ordered' - /'ʔuxər/ 'others'.
14. ṃ/ɣ as in /'ʕoṃə/ 'his fasting' - /'ʕoyə/ 'present (n.)'.
15. ṃ/ɣ̣ as in /'buṃə/ 'owl' - /'buɣ̣ə/ 'his bugle'.
16. ṃ/n as in /ʔɪ'ṃarə/ 'emirate' - /ʔɪ'narə/ 'lighting (n.)'.
17. ṃ/r as in /'ʕoṃə/ 'his fasting' - /'ʕorə/ 'his shape or appearance'.
18. ṃ/l as in /'xaṃə/ 'his cloth' - /'xalə/ 'his mole'.
19. ṃ/ḷ as in /'xaṃə/ 'his cloth' - /'xaḷə/ 'his maternal uncle'.
20. ṃ/s as in /'ʔuṃər/ 'he ordered' - /'ʔusər/ 'families'.
21. ṃ/z as in /'buṃə/ 'owl' - /'buzə/ 'his chin'.
22. ṃ/ʂ as in /'buṃə/ 'owl' - /'buʂə/ 'inch'.
23. ṃ/ǧ as in /ʔu'ṃur/ 'matters' - /ʔu'ǧur/ 'wages'.
24. ṃ/ʃ as in /ʔɪ'ṃarə/ 'emirate' - /ʔɪ'ʃarə/ 'signal (n.)'.
25. ṃ/ḥ as in /'ʔəsṃər/ 'brown-skinned' - /'ʔəʃḥər/ 'I fascinate'.
26. ṃ/ʕ as in /'ḳəṃər/ 'moon' - /'ḳəʕər/ 'bottom'.
27. ṃ/ʔ as in /ṃəs'ṃu(ʕ)/ 'audible' - /ṃəs'ʔu(1)/ 'responsible'.
28. ṃ/ḥ as in /'ḳəṃər/ 'moon' - /'ḳəḥər/ 'sadness'.

29.  $\text{m}/i$  as in /'sæmmær/ 'he repaired' - /'sæiiær/ 'he weighed (sth.)'.

30.  $\text{m}/u$  as in /'xamə/ 'his cloth' - /'xauə/ 'protection money'.

(c) In word-final position, /m/ enters into the following distinctive oppositions:

1.  $\text{m}/\text{f} = \text{f}/\text{m}$  (see section 12.4 above).
2.  $\text{m}/\text{m} = \text{m}/\text{m}$  (see section 12.5 above).
3.  $\text{m}/\text{t}$  as in /sɔm/ 'fasting (n.)' - /sɔt/ 'voice (n.)'.
4.  $\text{m}/\text{d}$  as in /səm/ 'handful' - /səd/ 'he threw back'.
5.  $\text{m}/\text{t}$  as in /sɔm/ 'fasting (n.)' - /sɔt/ 'whip (n.)'.
6.  $\text{m}/\theta$  as in /ɣəm/ 'he dismissed (with a gesture)' - /ɣəθ/ 'he upset (sb.)'.
7.  $\text{m}/\delta$  as in /xəm/ 'he searched' - /xəð/ 'he shook'.
8.  $\text{m}/\text{k}$  as in /səm/ 'handful' - /sək/ 'cheque'.
9.  $\text{m}/\text{g}$  as in /təm/ 'he buried' - /tæg/ 'it or he exploded'.
10.  $\text{m}/\text{x}$  as in /ðəm/ 'he hid' - /ðəx/ 'pumping (n.)'.
11.  $\text{m}/\text{ɣ}$  as in /səm/ 'he fasted' - /səɣ/ 'he worded'.
12.  $\text{m}/\text{k}$  as in /bum/ 'owl' - /buk/ 'bugle'.
13.  $\text{m}/\text{n}$  as in /xəm/ 'cloth' - /xan/ 'he betrayed'.
14.  $\text{m}/\text{r}$  as in /səm/ 'he fasted' - /sar/ 'he became'.
15.  $\text{m}/\text{l}$  as in /xəm/ 'cloth' - /xal/ 'mole'.
16.  $\text{m}/\text{l}$  as in /xəm/ 'cloth' - /xal/ 'maternal uncle'.
17.  $\text{m}/\text{s}$  as in /xəm/ 'he searched' - /xəs/ 'lettuce'.
18.  $\text{m}/\text{z}$  as in /bum/ 'owl' - /buz/ 'chin'.
19.  $\text{m}/\text{s}$  as in /xəm/ 'he searched' - /xəs/ 'he specified'.

20. m/č as in /šum/ 'fast!' - /šuč/ 'fault'.
21. m/ǵ as in /šam/ 'he fasted' - /šaǵ/ 'teakwood'.
22. m/ʃ as in /xəm/ 'he searched' - /xəʃ/ 'he entered'.
23. m/ħ as in /šəm/ 'handful' - /šəħ/ 'correct (adj.)'.
24. m/ʕ as in /ðam/ '(he) having hidden' - /ðaʕ/ 'he was lost'.
25. m/? as in /xam/ 'cloth' - /xaʔ/ 'the name of the letter "x"'
26. m/i as in /ðəm/ 'he hid' - /ðəi/ 'girl's name'.
27. m/u as in /xam/ 'cloth' - /xau/ 'protection money'.

### Summary:

The phoneme /m/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 25 consonant phonemes and 2 vowel phonemes word-finally; i.e. /m/ forms a total of 86 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.7 The Opposability of /t/.

The opposability of the phoneme /t/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /t/ enters into the following distinctive oppositions:

1. t/p = p/t (see section 12.2 above).
2. t/b = b/t (see section 12.3 above).
3. t/f = f/t (see section 12.4 above).
4. t/m = m/t (see section 12.5 above).



5. t/m̥ = m̥/t (see section 12.6 above).
6. t/d̥ as in /tin/ 'figs' - /din/ 'religion'.
7. t/ɸ̥ as in /tin/ 'figs' - /ɸ̥in/ 'mud'.
8. t/θ̥ as in /'tobə/ 'repentance' - /'θobə/ 'his shirt'.
9. t/ð̥ as in /təl/ 'hill' - /ð̥əl/ 'he humiliated'.
10. t/ð̥̥ as in /təl/ 'hill' - /ð̥̥əl/ 'it or he stayed'.
11. t/k̥ as in /tom̥/ 'twins' - /kom̥/ 'pile (n.)'.
12. t/g̥ as in /tom̥/ 'twins' - /gom̥/ 'enemies'.
13. t/x̥ as in /təl/ 'hill' - /x̥əl/ 'he violated (a law)'.
14. t/ɣ̥ as in /'talɪ/ 'end (n.)' - /'ɣalɪ/ 'expensive'.
15. t/k̥̥ as in /təl/ 'hill' - /k̥̥əl/ 'it decreased'.
16. t/n̥ as in /tom̥/ 'twins' - /nom̥/ 'sleep (n.)'.
17. t/r̥ as in /'tabɪʳ̥/ 'follower' - /'rabɪʳ̥/ 'fourth'.
18. t/s̥ as in /'tabɪʳ̥/ 'follower' - /'sabɪʳ̥/ 'seventh'.
19. t/z̥ as in /'tɪnə/ 'he waited' - /'zɪnə/ 'he committed adultery'.
20. t/ʃ̥ as in /tin/ 'figs' - /ʃ̥in/ 'China'.
21. t/ʧ̥ as in /təm/ 'it was completed' - /ʧ̥əm/ 'how many?'.
22. t/ǰ̥ as in /'tɪnə/ 'he waited' - /'ǰɪnə/ 'he wronged'.
23. t/ʃ̥̥ as in /təl/ 'hill' - /ʃ̥̥əl/ 'he paralyzed'.
24. t/h̥ as in /'tin/ 'figs' - /hin/ 'time'.
25. t/ʰ̥ as in /'talɪ/ 'end (n.)' - /'ʰalɪ/ 'high'.
26. t/?̥ as in /'tɪlə/ 'he recited' - /'?ɪlə/ 'to him'.
27. t/h̥̥ as in /təm/ 'it was completed' - /h̥̥əm/ 'worry (n.)'.
28. t/i̥ as in /tom̥/ 'twins' - /iom̥/ 'day'.
29. t/u̥ as in /təl/ 'lamp-post' - /uel/ 'distress (n.)'.

(b) In word-medial position, /t/ enters into the following distinctive oppositions:

1. t/p = p/t (see section 12.2 above).
2. t/b = b/t (see section 12.3 above).
3. t/f = f/t (see section 12.4 above).
4. t/m = m/t (see section 12.5 above).
5. t/ṃ = ṃ/t (see section 12.6 above).
6. t/d̥ as in /'xɪtəm/ 'he completed' - /'xɪdəm/ 'he served'.
7. t/ɸ as in /'nɪtər/ 'he spoke sharply' - /'nɪɸər/ 'he awaited'.
8. t/θ as in /'nɪtər/ 'he spoke sharply' - /'nɪθər/ 'he scattered'.
9. t/ð as in /'nɪtər/ 'he spoke sharply' - /'nɪðər/ 'he warned'.
10. t/ɔ̥ as in /'nɪtər/ 'he spoke sharply' - /'nɪɔ̥ər/ 'he looked into'.
11. t/k as in /'rʊtbə/ 'status or rank' - /'rʊkbə/ 'knee'.
12. t/g as in /'rʊtbə/ 'status or rank' - /'rʊgbə/ 'neck'.
13. t/x as in /'sɪtər/ 'jackets' - /'sɪxər/ 'he spoke ironically of'.
14. t/ɣ as in /'ʂotə/ 'his voice' - /'ʂoɣə/ 'present (n.)'.
15. t/ɰ as in /'jæftə/ 'his shift' - /'jæfɰə/ 'hat'.
16. t/n as in /'jɪftə/ 'I saw him' - /'jɪfnə/ 'we saw'.
17. t/r as in /'jæftə/ 'his shift' - /'jæfrə/ 'blade'.
18. t/l̥ as in /tə̆'tɪm/ 'blackout' - /tə̆'lim/ 'education'.
19. t/l̥ as in /'ʂotə/ 'his voice' - /'ʂol̥ə/ 'his key piece (in a game of marbles)'.

20. t/s as in /'batət/ 'she stayed overnight' - /'basət/ 'she kissed'.
21. t/z as in /'bitər/ 'he cut off' - /'bizər/ 'he begot'.
22. t/ʒ as in /'nitər/ 'he spoke sharply' - /'niʒər/ 'he granted victory to'.
23. t/č as in /'nətɪr/ 'speaking sharply' - /'nəčɪr/ 'defiant'.
24. t/ǵ as in /'nətɪr/ 'speaking sharply' - /'nəǵɪr/ 'chopping (n.)'.
25. t/ʃ as in /'nətɪr/ 'speaking sharply' - /'nəʃɪr/ 'publishing (n.)'.
26. t/h as in /'sɪtər/ 'jackets' - /'sɪhər/ 'he fascinated'.
27. t/ʳ as in /'sɪtɪr/ 'protection' - /'sɪʳɪr/ 'price'.
28. t/? as in /'tʃatəm/ 'exchanged insults with (sb.)' - /'tʃa?əm/ 'he was pessimistic'.
29. t/h as in /'sɪtər/ 'jackets' - /'sɪhər/ 'he stayed up late at night'.
30. t/i as in /'ʃatɪl/ '(he) having planted' - /'ʃaɪl/ '(he) having moved out'.
31. t/u as in /?əh'taɪ/ 'I deceive' - /?əh'uaɪ/ 'conditions or matters'.

(c) In word-final position, /t/ enters into the following distinctive oppositions:

1. t/f = f/t (see section 12.4 above).
2. t/m = m/t (see section 12.5 above).
3. t/ṁ = ṁ/t (see section 12.6 above).
4. t/d as in /ʃɪt/ 'fame' - /ʃɪd/ 'hunt!'

5. t/ɕ as in /ʂot/ 'voice (n.)' - /ʂotɕ/ 'whip (n.)'.
6. t/θ as in /bət/ 'thin bracelet' - /bəθ/ 'broadcasting (n.)'.
7. t/ð as in /fət/ 'it (i.e. the mind) wandered' - /fəð/ 'he deviated from'.
8. t/ð̣ as in /bet/ 'house' - /beð̣/ 'egg(s)'.
9. t/k as in /ǰət/ 'clover' - /ǰək/ 'jug'.
10. t/g as in /bat/ 'he stayed overnight' - /bag/ 'he stole or robbed'.
11. t/x as in /fət/ 'it (i.e. the mind) wandered' - /fəx/ 'he urinated'.
12. t/ɣ as in /ʂit/ 'fame' - /ʂiɣ/ 'word!'.
13. t/ɕ̣ as in /fat/ '(the mind) having wandered' - /faḳ/ 'difficult'.
14. t/n as in /ǰət/ 'clover' - /ǰən/ 'he became mad'.
15. t/r as in /bat/ 'he stayed overnight' - /bar/ 'drinking bar'.
16. t/l as in /bat/ 'he stayed overnight' - /bal/ 'mind or brain'.
17. t/ḷ as in /ʂot/ 'voice (n.)' - /ʂoḷ/ 'key piece (in a game of marbles)'.
18. t/s as in /bat/ 'he stayed overnight' - /bas/ 'he kissed'.
19. t/z as in /fat/ 'he passed by' - /faz/ 'he won'.
20. t/ʂ as in /bat/ 'he stayed overnight' - /baʂ/ 'bus'.
21. t/č as in /'ʂəuuət/ 'he voted' - /'ʂəuuəč/ 'he held (sb.) responsible'.
22. t/ǰ̣ as in /bet/ 'house' - /beǰ̣/ 'beige'.
23. t/ʃ as in /bet/ 'house' - /beʃ/ 'how much for?'.

24. t/h as in /bat/ 'he stayed overnight' - /baʰ/ 'he revealed (a secret)'.  
 25. t/s as in /bat/ 'he stayed overnight' - /baʳ/ 'he sold'.  
 26. t/? as in /bat/ 'he stayed overnight' - /baʔ/ 'the name of the letter "b"'.  
 27. t/h as in /'ʃəuuət/ 'he kicked a ball' - /'ʃəuuəh/ 'he distorted'.  
 29. t/i as in /fæt/ 'it broke' - /fəi/ 'shade'.  
 30. t/u as in /ʒət/ 'clover' - /ʒəu/ 'weather'.

### Summary:

The phoneme /t/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 29 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally; i.e. /t/ forms a total of 89 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.8 The Opposability of /d/.

The opposability of the phoneme /d/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /d/ enters into the following distinctive oppositions:

1. d/p = p/d (see section 12.2 above).
2. d/b = b/d (see section 12.3 above).
3. d/f = f/d (see section 12.4 above).

4.  $\text{d}/\text{m} = \text{m}/\text{d}$  (see section 12.5 above).
5.  $\text{d}/\text{m} = \text{m}/\text{d}$  (see section 12.6 above).
6.  $\text{d}/\text{t} = \text{t}/\text{d}$  (see section 12.7 above).
7.  $\text{d}/\text{t}$  as in  $/\text{d}\text{i}\text{n}/$  'religion' -  $/\text{t}\text{i}\text{n}/$  'mud'.
8.  $\text{d}/\theta$  as in  $/\text{d}\text{a}\text{r}/$  'house' -  $/\theta\text{a}\text{r}/$  'revenge (n.)'.
9.  $\text{d}/\delta$  as in  $/\text{d}\text{a}\text{l}/$  'it indicated or proved' -  $/\delta\text{a}\text{l}/$  'he humiliated'.
10.  $\text{d}/\delta$  as in  $/\text{d}\text{a}\text{l}/$  'it indicated or proved' -  $/\delta\text{a}\text{l}/$  'he stayed'.
11.  $\text{d}/\text{k}$  as in  $/\text{d}\text{a}\text{s}/$  'he trod (on)' -  $/\text{k}\text{a}\text{s}/$  'cup'.
12.  $\text{d}/\text{g}$  as in  $/\text{d}\text{a}\text{s}/$  'he trod (on)' -  $/\text{g}\text{a}\text{s}/$  'he touched'.
13.  $\text{d}/\text{x}$  as in  $/\text{'d}\text{a}\text{l}\text{l}\text{e}\text{t}/$  'coffee pot' -  $/\text{'x}\text{a}\text{l}\text{l}\text{e}\text{t}/$  'he put'.
14.  $\text{d}/\gamma$  as in  $/\text{d}\text{a}\text{r}/$  'house' -  $/\gamma\text{a}\text{r}/$  'he became jealous'.
15.  $\text{d}/\text{k}$  as in  $/\text{d}\text{a}\text{s}/$  'he trod (on)' -  $/\text{k}\text{a}\text{s}/$  'he measured'.
16.  $\text{d}/\text{n}$  as in  $/\text{d}\text{a}\text{r}/$  'house' -  $/\text{n}\text{a}\text{r}/$  'fire (n.)'.
17.  $\text{d}/\text{r}$  as in  $/\text{d}\text{a}\text{s}/$  'he trod (on)' -  $/\text{r}\text{a}\text{s}/$  'head (n.)'.
18.  $\text{d}/\text{s}$  as in  $/\text{d}\text{a}\text{m}/$  'blood' -  $/\text{s}\text{a}\text{m}/$  'he poisoned'.
19.  $\text{d}/\text{z}$  as in  $/\text{d}\text{a}\text{r}/$  'house' -  $/\text{z}\text{a}\text{r}/$  'he visited'.
20.  $\text{d}/\text{s}$  as in  $/\text{d}\text{a}\text{r}/$  'house' -  $/\text{s}\text{a}\text{r}/$  'he became'.
21.  $\text{d}/\text{č}$  as in  $/\text{d}\text{a}\text{m}/$  'blood' -  $/\text{č}\text{a}\text{m}/$  'how many?'.
22.  $\text{d}/\text{g}$  as in  $/\text{d}\text{a}\text{r}/$  'house' -  $/\text{g}\text{a}\text{r}/$  'neighbour'.
23.  $\text{d}/\text{j}$  as in  $/\text{d}\text{a}\text{m}/$  'blood' -  $/\text{j}\text{a}\text{m}/$  'he smelled (sth.)'.
24.  $\text{d}/\text{h}$  as in  $/\text{d}\text{a}\text{r}/$  'house' -  $/\text{h}\text{a}\text{r}/$  'hot'.
25.  $\text{d}/\text{r}$  as in  $/\text{d}\text{a}\text{r}/$  'house' -  $/\text{r}\text{a}\text{r}/$  'disgrace (n.)'.
26.  $\text{d}/\text{?}$  as in  $/\text{d}\text{a}\text{s}/$  'he trod (on)' -  $/\text{?}\text{a}\text{s}/$  'ace (in a game of cards)'.

27. a/h as in /dæm/ 'blood' - /hæm/ 'worry (n.)'.
28. a/i as in /das/ 'he trod (on)' - /ias/ 'privet'.
29. a/u as in /'dærɪd/ 'bad luck' - /'uærɪd/ 'flowers'.

(b) In word-medial position, /a/ enters into the following distinctive oppositions:

1. a/p = p/a (see section 12.2 above).
2. a/b = b/a (see section 12.3 above).
3. a/f = f/a (see section 12.4 above).
4. a/m = m/a (see section 12.5 above).
5. a/ṃ = ṃ/a (see section 12.6 above).
6. a/t = t/a (see section 12.7 above).
7. a/ṭ as in /'sədə/ 'except' - /'səṭə/ 'boy's name'.
8. a/θ as in /'nɪdər/ 'it became scarce' - /'nɪθər/ 'he scattered'.
9. a/ð as in /'sədɪl/ 'just (adj.)' - /'sədɪl/ 'enemy'.
10. a/ḡ as in /'nɪdər/ 'it became scarce' - /'nɪḡər/ 'he looked into'.
11. a/k as in /'nɪdər/ 'it became scarce' - /'nɪkər/ 'he denied'.
12. a/g as in /'rɪdəs/ 'he punished (sb.) for being offensive' - /'rɪgəs/ 'he patched'.
13. a/x as in /?ə'daɪr/ 'I manage' - /?ə'xɪr/ 'final'.
14. a/ɣ as in /'sɒdə/ 'soda water' - /'sɒɣə/ 'present (n.)'.
15. a/ḵ as in /'sədɪl/ 'just (adj.)' - /'səḵɪl/ 'sensible'.
16. a/n as in /'sədə/ 'habit' - /'sənə/ 'he suffered'.
17. a/r as in /'sədə/ 'habit' - /'?arə/ 'his disgrace'.
18. a/l as in /'sədə/ 'habit' - /'salə/ 'burden'.

19. d/l̥ as in /'sɔdə/ 'soda water' - /'sɔl̥ə/ 'his key piece (in a game of marbles)'.
20. d/s as in /ʔə'dɪr/ 'I manage' - /ʔə'sɪr/ 'captive'.
21. d/z as in /'sədə/ 'except' - /'ʔəzə/ 'mourning ceremony'.
22. d/ʃ as in /'sədə/ 'except' - /'səʃə/ 'walking stick'.
23. d/č as in /'hɪdə/ 'he sang (to urge camels on)' - /'hɪčə/ 'he spoke'.
24. d/ǵ as in /'rɪdəʃ/ 'he punished (sb.) for being offensive' - /'rɪǵəʃ/ 'he came back'.
25. d/ʃ as in /'sədə/ 'except' - /'səʃə/ 'supper'.
26. d/h̥ as in /'nɪdər/ 'it became scarce' - /'nɪh̥ər/ 'he slaughtered'.
27. d/ʃ as in /ʔə'dɪr/ 'I manage' - /ʔə'sɪr/ 'I lend'.
28. d/ʔ as in /'sɪdəl/ 'he closed (his eyes)' - /'sɪʔəl/ 'he asked'.
29. d/h̥ as in /'sɪdəl/ 'he closed (his eyes)' - /'sɪh̥əl/ 'it became simple'.
30. d/i as in /'sədə/ 'except' - /'səiə/ 'sickness'.
31. d/u as in /'hɑlɪ/ 'my condition' - /'haur/ 'containing (adj.)'.

(c) In word-final position, /d/ enters into the following distinctive oppositions:

1. d/f = f/d (see section 12.4 above).
2. d/m = m/d (see section 12.5 above).
3. d/m̥ = m̥/d (see section 12.6 above).
4. d/t = t/d (see section 12.7 above).



5. a/ɥ as in /xəd/ 'cheek' - /xət/ 'handwriting'.
6. a/θ as in /'ɹɪbəd/ 'he worshipped' - /'ɹɪbəθ/ 'he caused disorder'.
7. a/ð as in /ʃəd/ 'he tied' - /ʃəð/ 'he deviated (from)'.
8. a/ð̥ as in /ʃəd/ 'he counted' - /ʃəð̥/ 'it or he bit'.
9. a/k as in /ʃəd/ 'he tied' - /ʃək/ 'suspicion'.
10. a/g as in /ʃəd/ 'he tied' - /ʃəg/ 'tear (n.)'.
11. a/x as in /dəd/ 'brother' - /dax/ 'he felt dizzy'.
12. a/ɣ as in /ʃəd/ 'he hunted' - /ʃəɣ/ 'he worded'.
13. a/k̥ as in /həd/ 'limit (n.)' - /hək̥/ 'justice'.
14. a/n as in /xəd/ 'cheek' - /xən/ 'he spoke nasally'.
15. a/r as in /həd/ 'limit (n.)' - /hər/ 'hot weather'.
16. a/l as in /həd/ 'limit (n.)' - /həl/ 'solution'.
17. a/l̥ as in /xəd/ 'cheek' - /xəl̥/ 'vinegar'.
18. a/s as in /xəd/ 'cheek' - /xəs/ 'lettuce'.
19. a/z as in /həd/ 'limit (n.)' - /həz/ 'notch (n.)'.
20. a/ʃ as in /xəd/ 'cheek' - /xəʃ/ 'he specified'.
21. a/č as in /bɪd/ 'with one's hand' - /bɪč/ 'in you (sing. f.)'.
22. d/ǧ as in /ʃəd/ 'he came back' - /ʃəǧ/ 'ivory'.
23. a/ʃ as in /ʃəd/ 'he came back' - /ʃəʃ/ 'he lived'.
24. a/h̥ as in /ʃəd/ 'he threw back' - /ʃəh̥/ 'correct (adj.)'.
25. a/ʃ̥ as in /ʃəd/ 'he tied' - /ʃəʃ̥/ 'it or he shone'.
26. a/? as in /səd/ 'it prevailed' - /sa?/ 'it became worse'.
27. a/h as in /ʃəd/ 'he praised' - /ʃah/ 'Shah'.
28. a/i as in /həd/ 'limit (n.)' - /həi/ 'alive'.
29. a/u as in /ǧəd/ 'he worked hard' - /ǧəu/ 'weather'.

Summary:

The phoneme /a/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 29 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally; i.e. /a/ forms a total of 89 different distinctive oppositions within the SIA system of phonological oppositions.

12.9 The Opposability of /ṭ/.

The opposability of the phoneme /ṭ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ṭ/ enters into the following distinctive oppositions:

1. ṭ/p = p/ṭ (see section 12.2 above).
2. ṭ/b = b/ṭ (see section 12.3 above).
3. ṭ/f = f/ṭ (see section 12.4 above).
4. ṭ/m = m/ṭ (see section 12.5 above).
5. ṭ/ṃ = ṃ/ṭ (see section 12.6 above).
6. ṭ/t = t/ṭ (see section 12.7 above).
7. ṭ/d = d/ṭ (see section 12.8 above).
8. ṭ/θ as in /ṭar/ 'it or he flew' - /θar/ 'revenge (n.)'.
9. ṭ/ð as in /ṭal/ 'it became longer' - /ðal/ 'the name of the letter "ð"'.  
 10. ṭ/ḍ as in /ṭar/ 'it or he flew' - /ḍar/ 'harmful'.
11. ṭ/k as in /ṭus/ 'drinking bowls' - /kus/ 'cups'.

12. t̥/g as in /t̥aɪ/ 'it became longer' - /gɪ/ 'he said'.
13. t̥/x as in /t̥əs/ 'he visited unexpectedly' - /xəs/ 'lettuce'.
14. t̥/ɣ as in /t̥ɑr/ 'it or he flew' - /ɣɑr/ 'he became jealous'.
15. t̥/k̥ as in /t̥əs/ 'he visited unexpectedly' - /k̥əs/ 'priest'.
16. t̥/n as in /t̥ɑr/ 'it or he flew' - /nɑr/ 'fire (n.)'.
17. t̥/r as in /'t̥asə/ 'drinking bowl' - /'rəsə/ 'his head'.
18. t̥/s as in /t̥ɑr/ 'it or he flew' - /sɑr/ 'he walked'.
19. t̥/z as in /t̥ɑr/ 'it or he flew' - /zɑr/ 'he visited'.
20. t̥/ʃ as in /t̥ɪn/ 'mud' - /ʃɪn/ 'China'.
21. t̥/č as in /'t̥ɪbnə/ 'we recovered' - /'čɪbnə/ 'felt pad'.
22. t̥/ǧ as in /t̥ɪbnə/ 'we recovered' - /'ǧɪbnə/ 'we brought'.
23. t̥/ʃ as in /t̥aɪ/ 'it became longer' - /ʃaɪ/ 'he moved out'.
24. t̥/h̥ as in /t̥ɪn/ 'mud' - /h̥ɪn/ 'time'.
25. t̥/ʃ as in /t̥ɑr/ 'it or he flew' - /ʃɑr/ 'disgrace (n.)'.
26. t̥/? as in /t̥əx/ 'it or he hit' - /?əx/ 'brother'.
27. t̥/h̥ as in /'t̥əbbəʃ/ 'he played (in water)' - /'həbbəʃ/ 'he milled'.
28. t̥/i as in /'t̥ərdə/ 'dismissal' - /'iərdə/ 'yard'.
29. t̥/u as in /'t̥ərdə/ 'dismissal' - /'uərdə/ 'flower'.

(b) In word-medial position, /t̥/ enters into the following distinctive oppositions:

1. t̥/p = p/t̥ (see section 12.2 above).
2. t̥/b = b/t̥ (see section 12.3 above).
3. t̥/f = f/t̥ (see section 12.4 above).
4. t̥/m = m/t̥ (see section 12.5 above).
5. t̥/ɱ = ɱ/t̥ (see section 12.6 above).

6. ɬ/t = t/ɬ (see section 12.7 above).
7. ɬ/d = d/ɬ (see section 12.8 above).
8. ɬ/θ as in /ʰu'ɬur/ 'various types of perfume' - /ʰu'θur/ 'finding (lost property)'.
9. ɬ/ð as in /'ʃəɬir/ 'cutting into two equal parts' - /'ʃəðir/ 'turquoise'.
10. ɬ/ð̥ as in /'ʔəɬtər/ 'more dangerous' - /'ʔəð̥tər/ 'green'.
11. ɬ/k as in /'ʃiɬər/ 'he cut into two equal parts' - /'ʃikər/ 'he thanked'.
12. ɬ/g as in /'ʔəʃtər/ 'cleverer' - /'ʔəʃgər/ 'blonde (adj.)'.
13. ɬ/x as in /'ʃiɬər/ 'he cut into two equal parts' - /'ʃixər/ 'he snored'.
14. ɬ/ɣ as in /'ʃiɬər/ 'he cut into two equal parts' - /'ʃiɣər/ 'it became vacant'.
15. ɬ/ḳ as in /'bət̪tər/ 'dissatisfaction' - /'bət̪kər/ 'cows'.
16. ɬ/n as in /'ziɬə/ 'wagtail' - /'zinə/ 'decoration'.
17. ɬ/r as in /xə'ɬir/ 'dangerous' - /xə'rir/ 'the sound of flowing water'.
18. ɬ/l as in /'ʰət̪tə/ 'boy's name' - /'ʰəl̪tə/ 'on'.
19. ɬ/ɭ as in /'ʃiɬtə/ 'he burgled' - /'ʃiɭtə/ 'he sprayed with gunfire'.
20. ɬ/s as in /'ʔəɬtər/ 'more dangerous' - /'ʔəxsər/ 'I lose'.
21. ɬ/z as in /'ʰət̪tə/ 'boy's name' - /'ʰəzə/ 'mourning ceremony'.
22. ɬ/ʃ as in /'ʰət̪tə/ 'boy's name' - /'ʰəʃə/ 'walking stick'.
23. ɬ/č as in /'fərɬət/ 'she split the seeds' - /'fərčət/ 'she brushed'.

24. ʈ/ǧ as in /'nɪʈə/ 'he gave' - /'nɪǧə/ 'he was safe'.
25. ʈ/ʃ as in /'səʈə/ 'boy's name' - /'səʃə/ 'supper'.
26. ʈ/ħ as in /'ʃɪʈə/ 'he burgled' - /'ʃɪħə/ 'he sobered up'.
27. ʈ/ʕ as in /'nɪʈər/ 'he awaited' - /'nɪʕər/ 'it or he roared'.
28. ʈ/? as in /'naʈɪ/ '(he) having given' - /'naʔɪ/ 'very far'.
29. ʈ/h as in /'kəʈər/ 'Qatar' - /'kəhər/ 'sadness'.
30. ʈ/i as in /'səʈə/ 'boy's name' - /'səiə/ 'sickness'.
31. ʈ/u as in /'ʃaʈɪr/ 'clever' - /'ʃauɪr/ 'whisper!'

(c) In word-final position, /ʈ/ enters into the following distinctive oppositions:

1. ʈ/ɸ = ɸ/ʈ (see section 12.4 above).
2. ʈ/m = m/ʈ (see section 12.5 above).
3. ʈ/ṃ = ṃ/ʈ (see section 12.6 above).
4. ʈ/t = t/ʈ (see section 12.7 above).
5. ʈ/d = .d/ʈ (see section 12.8 above).
6. ʈ/θ as in /ħəʈ/ 'he put' - /ħəθ/ 'he encouraged'.
7. ʈ/ð as in /ʃəʈ/ 'river' - /ʃəð/ 'he deviated from'.
8. ʈ/ð̣ as in /xəʈ/ 'handwriting' - /xəð̣/ 'he shook'.
9. ʈ/k as in /ʃəʈ/ 'river' - /ʃək/ 'suspicion'.
10. ʈ/g as in /ʃəʈ/ 'river' - /ʃəg/ 'tear (n.)'.
11. ʈ/x as in /ʃəʈ/ 'river' - /ʃex/ 'he urinated'.
12. ʈ/ɣ as in /ʃaʈ/ 'he became upset' - /ʃaɣ/ 'he reacted emotionally to bad news'.
13. ʈ/ḳ as in /ħəʈ/ 'he put' - /ħəḳ/ 'justice'.
14. ʈ/n as in /ħəʈ/ 'he put' - /ħən/ 'he longed for'.



### 12.10. The Opposability of /ə/.

The opposability of the phoneme /ə/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ə/ enters into the following distinctive oppositions:

1. ə/p = p/ə (see section 12.2 above).
2. ə/b = b/ə (see section 12.3 above).
3. ə/f = f/ə (see section 12.4 above).
4. ə/m = m/ə (see section 12.5 above).
5. ə/ṃ = ṃ/ə (see section 12.6 above).
6. ə/t = t/ə (see section 12.7 above).
7. ə/d = d/ə (see section 12.8 above).
8. ə/ṭ = ṭ/ə (see section 12.9 above).
9. ə/ð as in /'θəruə/ 'wealth' - /'ðəruə/ 'peak (of power or success)'.
10. ə/ð̣ as in /θaɾ/ 'revenge (n.)' - /ð̣aɾ/ 'harmful'.
11. ə/k as in /'θɪrəṃ/ 'he chopped' - /'kɪrəṃ/ 'he was generous'.
12. ə/g as in /θuṃ/ 'garlic' - /guṃ/ 'stand up!'.
13. ə/x as in /θaɪ/ 'he became confused' - /xaɪ/ 'mole'.
14. ə/ɣ as in /θaɾ/ 'revenge (n.)' - /ɣaɾ/ 'he became jealous'.
15. ə/ḵ as in /'θanɪ/ 'second (adj.)' - /'ḵanɪ/ 'light (colour)'.
16. ə/n as in /θaɾ/ 'revenge (n.)' - /naɾ/ 'fire (n.)'.
17. ə/r as in /'θobə/ 'his shirt' - /'robə/ 'thick yoghurt'.
18. ə/s as in /θaɾ/ 'revenge (n.)' - /saɾ/ 'he walked'.
19. ə/z as in /θaɾ/ 'revenge (n.)' - /zaɾ/ 'he visited'.
20. ə/š as in /θaɾ/ 'revenge (n.)' - /šaɾ/ 'he became'.

21.  $\theta/\check{c}$  as in /'θarə/ 'his revenge' - /'čarə/ 'solution'.
22.  $\theta/\check{g}$  as in /θar/ 'revenge (n.)' - /ǵar/ 'neighbour'.
23.  $\theta/\jmath$  as in /θaɪ/ 'he became confused' - /ʃaɪ/ 'he moved out'.
24.  $\theta/h$  as in /θar/ 'revenge (n.)' - /har/ 'hot'.
25.  $\theta/s$  as in /θar/ 'revenge (n.)' - /sar/ 'disgrace (n.)'.
26.  $\theta/?$  as in /'θanɪ/ 'second (adj.)' - /'ʔanɪ/ 'I'.
27.  $\theta/h$  as in /θor/ 'bull' - /hor/ 'marsh'.
28.  $\theta/i$  as in /θə'mɪn/ 'valuable' - /iə'mɪn/ 'oath'.
29.  $\theta/u$  as in /'θʊbər/ 'it or he bothered continually' - /'ʊbər/ 'camel hair'.

(b) In word-medial position, /θ/ enters into the following distinctive oppositions:

1.  $\theta/b = b/\theta$  (see section 12.3 above).
2.  $\theta/f = f/\theta$  (see section 12.4 above).
3.  $\theta/m = m/\theta$  (see section 12.5 above).
4.  $\theta/m̥ = m̥/\theta$  (see section 12.6 above).
5.  $\theta/t = t/\theta$  (see section 12.7 above).
6.  $\theta/d = d/\theta$  (see section 12.8 above).
7.  $\theta/t̥ = t̥/\theta$  (see section 12.9 above).
8.  $\theta/\delta$  as in /'sɪθər/ 'he stumbled' - /'sɪðər/ 'he excused'.
9.  $\theta/\delta$  as in /'xuθrə/ 'curdling agent' - /'xuðrə/ 'vegetables'.
10.  $\theta/k$  as in /mə'θanə/ '(urinary) bladder' - /mə'kanə/ 'his place'.
11.  $\theta/g$  as in /'nɪθər/ 'he scattered' - /'nɪgər/ 'it or he tapped'.
12.  $\theta/x$  as in /ʔə'θɪr/ 'ether' - /ʔə'xɪr/ 'final'.



13. θ/γ as in /ʔə'θaɾ/ 'it or he aroused' - /ʔə'ɣaɾ/ 'I feel jealous'.
14. θ/κ as in /'ɾiθə/ 'he lamented' - /'ɾiκə/ 'he was promoted'.
15. θ/n as in /ʔə'θiɾ/ 'ether' - /ʔə'niɾ/ 'I light up (the way)'.
16. θ/ɾ as in /'ɿiθiɾ/ 'bunch (of dates)' - /'ɿiɾiɾ/ 'root (n.)'.
17. θ/l as in /'diθu/ '(a contemptuous term) idiot' - /'diɿu/ 'simpleton'.
18. θ/ɹ as in /'ɾoθə/ 'its (e.g. the horse's) dung' - /'ɾoɹə/ 'road-roller'.
19. θ/s as in /ʔə'θiɾ/ 'ether' - /ʔə'siɾ/ 'captive'.
20. θ/z as in /ʔə'θuɾ/ 'I rebel' - /ʔə'zuɾ/ 'I visit'.
21. θ/ʂ as in /ʔə'θiɾ/ 'ether' - /ʔə'ʂiɾ/ 'I become'.
22. θ/č as in /'nəθiɾ/ 'scattering (n.)' - /'nəčiɾ/ 'defiant'.
23. θ/ǵ as in /'niθəɾ/ 'he scattered' - /'niǵəɾ/ 'he chopped'.
24. θ/ʃ as in /ʔə'θiɾ/ 'ether' - /ʔə'ʃiɾ/ 'I point to'.
25. θ/h as in /'niθəɾ/ 'he scattered' - /'niħəɾ/ 'he slaughtered'.
26. θ/ɿ as in /ʔə'θiɾ/ 'ether' - /ʔə'ɿiɾ/ 'I lend'.
27. θ/? as in /mu'θənnə/ 'boy's name' - /mu'ʔənnə/ 'our provisions'.
28. θ/h as in /'ʔəθəl/ 'tamarisk' - /'ʔəhəl/ 'one's home or family'.
29. θ/i as in /mə'θanə/ 'bladder' - /mə'ianə/ 'close friendship'.
30. θ/u as in /ʔəm'θaɪ/ 'proverbs' - /ʔəm'uaɪ/ 'wealth'.

(c) In word-final position, /θ/ enters into the following distinctive oppositions:

1.  $\theta/\varepsilon = \varepsilon/\theta$  (see section 12.4 above).
2.  $\theta/m = m/\theta$  (see section 12.5 above).
3.  $\theta/\underset{\cdot}{m} = \underset{\cdot}{m}/\theta$  (see section 12.6 above).
4.  $\theta/t = t/\theta$  (see section 12.7 above).
5.  $\theta/d = d/\theta$  (see section 12.8 above).
6.  $\theta/\underset{\cdot}{t} = \underset{\cdot}{t}/\theta$  (see section 12.9 above).
7.  $\theta/\delta$  as in  $/'nɪ(k)\theta/$  'he broke (an obligation)' -  $/'nɪ(b)\delta/$  'he rejected'.
8.  $\theta/\delta$  as in  $/h\theta/$  'he encouraged' -  $/h\delta/$  'luck'.
9.  $\theta/k$  as in  $/h\theta/$  'he encouraged' -  $/h\theta k/$  'he scratched'.
10.  $\theta/g$  as in  $/b\theta/$  'broadcasting (n.)' -  $/b\theta g/$  'mosquitoes'.
11.  $\theta/x$  as in  $/b\theta/$  'broadcasting (n.)' -  $/b\theta x/$  'he sprayed'.
12.  $\theta/\gamma$  as in  $/n\theta/$  'it rained lightly' -  $/n\theta \gamma/$  'he pinched (sb.) for attention'.
13.  $\theta/k$  as in  $/h\theta/$  'he encouraged' -  $/h\theta k/$  'justice'.
14.  $\theta/n$  as in  $/h\theta/$  'he encouraged' -  $/h\theta n/$  'he longed for'.
15.  $\theta/r$  as in  $/h\theta/$  'he encouraged' -  $/h\theta r/$  'hot weather'.
16.  $\theta/l$  as in  $/h\theta/$  'he encouraged' -  $/h\theta l/$  'solution'.
17.  $\theta/\underset{\cdot}{l}$  as in  $/\gamma\theta/$  'he upset' -  $/\gamma\theta \underset{\cdot}{l}/$  'he poked'.
18.  $\theta/s$  as in  $/h\theta/$  'he encouraged' -  $/h\theta s/$  'he felt'.
19.  $\theta/z$  as in  $/h\theta/$  'he encouraged' -  $/h\theta z/$  'notch (n.)'.
20.  $\theta/\underset{\cdot}{s}$  as in  $/\gamma\theta/$  'he upset' -  $/\gamma\theta \underset{\cdot}{s}/$  'he choked'.
21.  $\theta/\check{c}$  as in  $/b\theta/$  'broadcasting (n.)' -  $/b\theta \check{c}/$  'packing (n.)'.
22.  $\theta/\check{g}$  as in  $/h\theta/$  'he encouraged' -  $/h\theta \check{g}/$  'he made the pilgrimage (to Mecca)'.
23.  $\theta/j$  as in  $/h\theta/$  'he encouraged' -  $/h\theta j/$  'he mowed the lawn'.

24.  $\theta/h$  as in  $/b\theta/$  'broadcasting (n.)' -  $/b\theta h/$  'it (i.e. the voice) became husky'.
25.  $\theta/s$  as in  $/ba\theta/$  '(he) having broadcast' -  $/ba^s/$  'he sold'.
26.  $\theta/?$  as in  $/ba\theta/$  '(he) having broadcast' -  $/ba^?/$  'the name of the letter "b"'. .
27.  $\theta/i$  as in  $/h\theta/$  'he encouraged' -  $/h\theta i/$  'alive'.
28.  $\theta/u$  as in  $/h\theta/$  'he encouraged' -  $/h\theta u/$  'wild plant'.

Summary:

The phoneme  $/\theta/$  is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 26 consonant phonemes and 2 vowel phonemes word-finally; i.e.  $/\theta/$  forms a total of 87 different distinctive oppositions within the SIA system of phonological oppositions.

12.11. The Opposability of  $/\delta/$ .

The opposability of the phoneme  $/\delta/$  within the SIA system of phonological oppositions is as follows:

(a) In word-initial position,  $/\delta/$  enters into the following distinctive oppositions:

1.  $\delta/p = p/\delta$  (see section 12.2 above).
2.  $\delta/b = b/\delta$  (see section 12.3 above).
3.  $\delta/f = f/\delta$  (see section 12.4 above).
4.  $\delta/m = m/\delta$  (see section 12.5 above).
5.  $\delta/\text{m} = \text{m}/\delta$  (see section 12.6 above).
6.  $\delta/t = t/\delta$  (see section 12.7 above).

7. ð/a = a/ð (see section 12.8 above).
8. ð/ʈ = ʈ/ð (see section 12.9 above).
9. ð/θ = θ/ð (see section 12.10 above).
10. ð/ð̥ as in /ð̥ɪl/ 'humiliation' - /ð̥ɪl/ 'shade'.
11. ð/k as in /'ðəɪlɪə/ 'he humiliated him' - /'kəɪlɪə/ 'header (in football)'.
12. ð/g as in /'ðəɪlɪə/ 'he humiliated him' - /'gəɪlɪə/ 'he said to him'.
13. ð/x as in /'ðəɪlɪə/ 'he humiliated him' - /'xəɪlɪə/ 'he put'.
14. ð/ɣ as in /'ðəɪlɪə/ 'he humiliated him' - /'ɣəɪlɪə/ 'he raised the price'.
15. ð/ɰ as in /'ðɪbəl/ 'it wilted' - /'ɰɪbəl/ 'he agreed'.
16. ð/n as in /'ðɪbəh/ 'he slaughtered' - /'nɪbəh/ 'it (i.e. the dog) barked'.
17. ð/r as in /'ðoɪə/ 'these (people)' - /'roɪə/ 'road-roller'.
18. ð/s as in /'ðəɪlɪə/ 'he humiliated him' - /'səɪlɪə/ 'basket'.
19. ð/z as in /'ðəɪlɪə/ 'he humiliated him' - /'zəɪlɪə/ 'mistake (n.)'.
20. ð/ʂ as in /ðəɾ/ 'he threw or scattered' - /ʂəɾ/ 'he wrapped in a cloth bundle'.
21. ð/č as in /ðak/ 'that (one)' - /čak/ 'base down, the winning position'.
22. ð/ǰ as in /'ðɪbəl/ 'it wilted' - /'ǰɪbəl/ 'mountain'.
23. ð/ʃ as in /'ðærɾə/ 'atom' - /'ʃærɾə/ 'his wickedness'.
24. ð/h̥ as in /ðəɾ/ 'he threw or scattered' - /h̥əɾ/ 'hot weather'.
25. ð/ʃ̥ as in /'ðəɪlɪə/ 'he humiliated him' - /'ʃ̥əɪlɪə/ 'he made (sth.) higher'.

26. ð/? as in /ðə'xɪrə/ 'ammunition' - /?ə'xɪrə/ 'final (f. sing.)'.
27. ð/h as in /ðak/ 'that (one)' - /hak/ 'take!'.
28. ð/i as in /ðəm/ 'he spoke ill of' - /iəm/ 'near'.
29. ð/u as in /ðeɪl/ 'tail' - /ueɪl/ 'distress (n.)'.

(b) In word-medial position, /ð/ enters into the following distinctive oppositions:

1. ð/b = b/ð (see section 12.3 above).
2. ð/ɸ = ɸ/ð (see section 12.4 above).
3. ð/m = m/ð (see section 12.5 above).
4. ð/ḡ = ḡ/ð (see section 12.6 above).
5. ð/t = t/ð (see section 12.7 above).
6. ð/d̥ = d̥/ð (see section 12.8 above).
7. ð/ʈ = ʈ/ð (see section 12.9 above).
8. ð/θ = θ/ð (see section 12.10 above).
9. ð/ð̥ as in /'nɪð̥ər/ 'he warned' - /'nɪð̥ər/ 'he looked into'.
10. ð /k as in /'nɪð̥ər/ 'he warned' - /'nɪkər/ 'he denied'.
11. ð/g as in /'nɪð̥ər/ 'he warned' - /'nɪgər/ 'it or he tapped'.
12. ð/x as in /bu'ður/ 'seeds' - /bu'xur/ 'incense (n.)'.
13. ð/ɣ as in /'ʃaðɪl/ 'boy's name' - /'ʃaɣɪl / '(he) having occupied'.
14. ð/ḵ as in /'s̥aðɪl/ 'enemy' - /'s̥aḵɪl/ 'sensible'.
15. ð/n as in /'hɪðə/ 'shoe(s)' - /'hɪnə/ 'he bent forward'.
16. ð/r as in /bə'ði?/ 'obscene' - /bə'ri?/ 'innocent'.
17. ð/l as in /'hɪðə/ 'shoe(s)' - /'hɪlə/ 'it or he became prettier'.

18. ð/ɹ̥ as in /'ɣæð(ð)ə/ 'he fed' - /'ɣæɹ̥(ɹ̥)ə/ 'he raised (the price)'.
19. ð/s as in /'nɪðɪɹ/ 'solemn pledge' - /'nɪsɪɹ/ 'eagle'.
20. ð/z as in /'sæðɪl/ 'enemy' - /'sæzɪl/ 'insulator'.
21. ð/ʒ as in /'nɪðəɹ/ 'he warned' - /'nɪʒəɹ/ 'he granted victory to'.
22. ð/ʃ as in /'hɪðə/ 'shoe(s)' - /'hɪʃə/ 'he spoke'.
23. ð/ʒ as in /'hɪðə/ 'he talked irrationally' - /'hɪʒə/ 'he satirized'.
24. ð/ʒ as in /'nɪðəɹ/ 'he warned' - /'nɪʒəɹ/ 'he published'.
25. ð/h as in /'nɪðəɹ/ 'he warned' - /'nɪhəɹ/ 'he slaughtered'.
26. ð/s as in /'ʃæðrə/ 'turquoise' - /'ʃæsɹə/ 'hair'.
27. ð/h as in /'ʃæðɹɪ/ 'turquoise-coloured' - /'ʃəhɹɪ/ 'monthly'.
28. ð/i as in /'hɪðə/ 'shoe(s)' - /'hɪiə/ 'he brought back to life'.
29. ð/u as in /'hæðɪ/ 'this one (f.)' - /'hauɪ/ 'amateur'.

(c) In word-final position, /ð/ enters into the following distinctive oppositions:

1. ð /f = f/ð (see section 12.4 above).
2. ð/m = m/ð (see section 12.5 above).
3. ð/t = t/ð (see section 12.7 above).
4. ð/d = d/ð (see section 12.8 above).
5. ð/ɰ = ɰ/ð (see section 12.9 above).
6. ð/θ = θ/ð (see section 12.10 above).
7. ð/ð̥ as in /fæð̥/ 'ingenious' - /fæð̥/ 'he got (it)over with'.

8. ð/k as in /fəð/ 'ingenious' - /fək/ 'he opened'.
9. ð/g as in /ʃəð/ 'he deviated from' - /ʃəg/ 'tear (n.)'.
10. ð/x as in /fəð/ 'ingenious' - /fəx/ 'trap (n.)'.
11. ð/ɣ as in /ʃað/ 'eccentric' - /ʃaɣ/ 'he reacted emotionally to bad news'.
12. ð/ɣ̣ as in /ʃað/ 'eccentric' - /ʃaɣ̣/ 'difficult'.
13. ð/n as in /fəð/ 'ingenious' - /fən/ 'art'.
14. ð/r as in /fəð/ 'ingenious' - /fər/ 'he eloped'.
15. ð/l as in /ʃað/ 'eccentric' - /ʃal/ 'he moved out'.
16. ð/z as in /fəð/ 'ingenious' - /fəz/ 'he was startled'.
17. ð/ʒ as in /'nɪbəð/ 'he rejected' - /'nɪbəʒ/ 'he interfered unnecessarily'.
18. ð/č as in /fəð/ 'ingenious' - /fəč/ 'jawbone'.
19. ð/ǰ as in /hað/ 'this one (m.)' - /haǰ/ 'it or he became furious'.
20. ð/ʃ as in /ʃað/ 'eccentric' - /ʃaʃ/ 'cheesecloth'.
21. ð/h̄ as in /ʃəð/ 'he deviated from' - /ʃəh̄/ 'it became scarce'.
22. ð/ʃ̣ as in /ʃəð/ 'he deviated from' - /ʃəʃ̣/ 'it or he shone'.
23. ð/? as in /ʃað/ 'eccentric' - /ʃa?/ 'he wanted'.
24. ð/h as in /ʃað/ 'eccentric' - /ʃah/ 'Shah'.
25. ð/i as in /fəð/ 'ingenious' - /fəi/ 'shade'.
26. ð/u as in /'həbbəð/ 'he preferred' - /'həbbəu/ 'they liked'.

### Summary:

The phoneme /ð/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 27 consonant phonemes and 2 vowel phonemes word-medially, and 24 consonant phonemes and 2 vowel phonemes word-finally, i.e. /ð/ forms a total of 84 different

distinctive oppositions within the SIA system of phonological oppositions.

### 12.12. The Opposability of /ǝ/.

The opposability of the phoneme /ǝ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ǝ/ enters into the following distinctive oppositions:

1. ǝ/p = p/ǝ (see section 12.2 above).
2. ǝ/b = b/ǝ (see section 12.3 above).
3. ǝ/f = f/ǝ (see section 12.4 above).
4. ǝ/m = m/ǝ (see section 12.5 above).
5. ǝ/ṁ = ṁ/ǝ (see section 12.6 above).
6. ǝ/t = t/ǝ (see section 12.7 above).
7. ǝ/d = d/ǝ (see section 12.8 above).
8. ǝ/ṭ = ṭ/ǝ (see section 12.9 above).
9. ǝ/θ = θ/ǝ (see section 12.10 above).
10. ǝ/ǎ = ǎ/ǝ (see section 12.11 above).
11. ǝ/k as in /'ǝɪfə/ 'river bank' - /'kɪfə/ 'it sufficed'.
12. ǝ/g as in /ǝəd/ 'he opposed' - /gəd/ 'equal to'.
13. ǝ/x as in /'ǝubəṭ/ 'he controlled' - /'xubəṭ/ 'he mixed'.
14. ǝ/ɣ as in /ǝar/ 'harmful' - /ɣar/ 'he became jealous'.
15. ǝ/ḳ as in /ǝəd/ 'he opposed' - /ḳəd/ 'perhaps'.
16. ǝ/n as in /ǝar/ 'harmful' - /nar/ 'fire (n.)'.
17. ǝ/r as in /ǝəd/ 'he opposed' - /rəd/ 'reply (n.)'.
18. ǝ/s as in /ǝəd/ 'he opposed' - /səd/ 'dam'.



19. ɔ̣/z as in /ɔ̣ar/ 'harmful' - /zar/ 'he visited'.
20. ɔ̣/ɟ as in /ɔ̣aɟ/ 'he became bored' - /ɟaɟ/ 'teakwood'.
21. ɔ̣/ʑ as in /ɔ̣əɔ̣/ 'he opposed' - /ʑəɔ̣/ 'he worked hard'.
22. ɔ̣/ɣ as in /ɔ̣ar/ 'harmful' - /ɣar/ 'neighbour'.
23. ɔ̣/ʃ as in /ɔ̣əɔ̣/ 'he opposed' - /ʃəɔ̣/ 'he tied'.
24. ɔ̣/h as in /ɔ̣ar/ 'harmful' - /har/ 'hot'.
25. ɔ̣/ʁ as in /ɔ̣ar/ 'harmful' - /ʁar/ 'disgrace (n.)'.
26. ɔ̣/? as in /ɔ̣əx/ 'pumping (n.)' - /?əx/ 'brother'.
27. ɔ̣/h as in /ɔ̣əɔ̣/ 'he opposed' - /həɔ̣/ 'he let go'.
28. ɔ̣/i as in /ɔ̣əɔ̣/ 'he opposed' - /iəɔ̣/ 'hand (n.)'.
29. ɔ̣/u as in /ɔ̣əɔ̣/ 'he opposed' - /uəɔ̣/ 'he liked'.

(b) In word-medial position, /ɔ̣/ enters into the following distinctive oppositions:

1. ɔ̣/b = b/ɔ̣ (see section 12.3 above).
2. ɔ̣/β = β/ɔ̣ (see section 12.4 above).
3. ɔ̣/m = m/ɔ̣ (see section 12.5 above).
4. ɔ̣/ṁ = ṁ/ɔ̣ (see section 12.6 above).
5. ɔ̣/t = t/ɔ̣ (see section 12.7 above).
6. ɔ̣/d = d/ɔ̣ (see section 12.8 above).
7. ɔ̣/ɗ = ɗ/ɔ̣ (see section 12.9 above).
8. ɔ̣/θ = θ/ɔ̣ (see section 12.10 above).
9. ɔ̣/ð = ð/ɔ̣ (see section 12.11 above).
10. ɔ̣/k as in /'niɔ̣ər/ 'he looked into' - /'nikər/ 'he denied'.
11. ɔ̣/g as in /'niɔ̣ər/ 'he looked into' - /'niɣər/ 'it or he tapped'.

12. ɔ̌/x as in /'baɔ̌ət/ 'it (i.e. the hen) laid eggs' - /'baxət/ 'it became insipid'.
13. ɔ̌/ɣ as in /'baɔ̌ət/ 'it (i.e. the hen) laid eggs' - /'bayət/ 'he took (sb.) by surprise'.
14. ɔ̌/ɣ̌ as in /ʃə'ɔ̌im/ 'great' - /ʃə'ɣ̌im/ 'sterile'.
15. ɔ̌/n as in /ʃə'ɔ̌id/ 'backer or supporter' - /ʃə'niɔ̌/ 'stubborn'.
16. ɔ̌/r as in /'raɔ̌ə/ 'he conciliated' - /'rarə/ 'it was transparent'.
17. ɔ̌/l as in /'xɪɔ̌əʃ/ 'he bowed' - /'xɪləʃ/ 'he dislocated'.
18. ɔ̌/ľ as in /'xaɔ̌ə/ 'he went through it' - /'xalə/ 'maternal aunt'.
19. ɔ̌/s as in /'raɔ̌ə/ 'he conciliated' - /'rasə/ 'his head'.
20. ɔ̌/z as in /'hɪɔ̌ər/ 'he was present' - /'hɪzər/ 'he guessed (correctly)'.
21. ɔ̌/ʃ as in /ʃə'ɔ̌idə/ 'his backer or supporter' - /ʃə'ʃidə/ 'thick porridge made of flour, oil or butter, and sugar'.
22. ɔ̌/ʃ̌ as in /'hɪɔ̌ə/ 'he witnessed' - /'hɪʃ̌ə/ 'he spoke'.
23. ɔ̌/ʃ̌ as in /'hɪɔ̌ər/ 'he was present' - /'hɪʃ̌ər/ 'rooms'.
24. ɔ̌/ʃ̌ as in /'hɪɔ̌ər/ 'he was present' - /'hɪʃ̌ər/ 'it stuck'.
25. ɔ̌/ȟ as in /'nɪɔ̌ər/ 'he looked into' - /'nɪȟər/ 'he slaughtered'.
26. ɔ̌/ʃ̌ as in /'raɔ̌ɪ/ 'in agreement (with)' - /'raʃ̌ɪ/ 'shepherd'.
27. ɔ̌/? as in /'rɪɔ̌ə/ 'he agreed' - /'rɪ?ə/ 'lung'.
28. ɔ̌/ȟ as in /'nəɔ̌ər/ 'eye sight' - /'nəȟər/ 'river'.
29. ɔ̌/i as in /'həɔ̌ɪr/ 'present (adj.)' - /'həɪr/ 'bewildered'.
30. ɔ̌/u as in /'raɔ̌ɪ/ 'in agreement (with)' - /'raʊɪ/ from Rawa (a town)'.

(c) In word-final position, / / enters into the following distinctive oppositions:

1. ǫ/ɛ = ɛ/ǫ (see section 12.4 above).
2. ǫ/m = m/ǫ (see section 12.5 above).
3. ǫ/ṃ = ṃ/ǫ (see section 12.6 above).
4. ǫ/t = t/ǫ (see section 12.7 above).
5. ǫ/d = d/ǫ (see section 12.8 above).
6. ǫ/ṭ = ṭ/ǫ (see section 12.9 above).
7. ǫ/θ = θ/ǫ (see section 12.10 above).
8. ǫ/ð = ð/ǫ (see section 12.11 above).
9. ǫ/k as in /həǫ/ 'luck' - /hək/ 'he scratched'.
10. ǫ/g as in /həǫ/ 'luck' - /hæg/ 'right (n.)'.
11. ǫ/x as in /fəǫ/ 'he solved' - /fəx/ trap (n.)'.
12. ǫ/ɣ as in /'fʊrəǫ/ 'he imposed (sth.) by force' - /'fʊrəɣ/ 'it was empty'.
13. ǫ/k̄ as in /həǫ/ 'luck' - /hək̄/ 'justice'.
14. ǫ/n as in /həǫ/ 'luck' - /hən/ 'he longed for'.
15. ǫ/r as in /həǫ/ 'luck' - /hər/ 'hot weather'.
16. ǫ/l as in /həǫ/ 'luck' - /həl/ 'solution'.
17. ǫ/l̄ as in /xəǫ/ 'he shook' - /xəl̄/ 'vinegar'.
18. ǫ/s as in /xəǫ/ 'he shook' - /xəs/ 'lettuce'.
19. ǫ/z as in /həǫ/ 'luck' - /həz/ 'notch (n.)'.
20. ǫ/s̄ as in /xəǫ/ 'he shook' - /xəs̄/ 'he specified'.
21. ǫ/č as in /fəǫ/ 'he solved' - /fəč/ 'jawbone'.
22. ǫ/ǧ as in /həǫ/ 'luck' - /həǧ/ 'he made the pilgrimage (to Mecca)'.

23. ə/ʃ as in /xəð/ 'he shook' - /xəʃ/ 'it or he entered'.
24. ə/h as in /fað/ 'it exceeded the limit' - /faħ/ 'it (i.e. odour) spread'.
25. ə/ʳ as in /beð/ 'egg(s)' - /beʳ/ 'selling (n.)'.
26. ə/? as in /mə'rið/ 'patient (n.)' - /mə'ri?/ 'esophagus'.
27. ə/i as in /həð/ 'luck' - /həi/ 'alive'.
28. ə/u as in /həð/ 'luck' - /həʷ/ 'wild plant'.

### Summary:

The phoneme /ə/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 26 consonant phonemes and 2 vowel phonemes word-finally; i.e. /ə/ forms a total of 87 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.13. The Opposability of /k/.

The opposability of the phoneme /k/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /k/ enters into the following distinctive oppositions:

1. k/p = p/k (see section 12.2 above).
2. k/b = b/k (see section 12.3 above).
3. k/f = f/k (see section 12.4 above).
4. k/m = m/k (see section 12.5 above).
5. k/ṃ = ṃ/k (see section 12.6 above).
6. k/t = t/k (see section 12.7 above).
7. k/d = d/k (see section 12.8 above).
8. k/ṭ = ṭ/k (see section 12.9 above).

9. k/θ = θ/k (see section 12.10 above).
10. k/ð = ð/k (see section 12.11 above).
11. k/ð̥ = ð̥/k (see section 12.12 above).
12. k/g as in /'kʊbbə/ 'meatballs made from meat with rice or cracked wheat and spices' - /'gʊbbə/ 'room'.
13. k/x as in /kəd/ 'he worked hard' - /xəd/ 'cheek'.
14. k/ɣ as in /kɑɾ/ 'profession' - /ɣɑɾ/ 'he felt jealous'.
15. k/ɕ as in /kas/ 'cup' - /ɕas/ 'he measured'.
16. k/n as in /kas/ 'cup' - /nas/ 'people'.
17. k/r as in /kas/ 'cup' - /ras/ 'head (n.)'.
18. k/s as in /kəd/ 'he worked hard' - /səd/ 'dam'.
19. k/z as in /kɑɾ/ 'profession' - /zɑɾ/ 'he visited'.
20. k/ʂ as in /kəd/ 'he worked hard' - /ʂəd/ 'he threw back'.
21. k/č as in /kak/ 'tap or cock' - /čak/ 'base down, the winning position'.
22. k/ǰ as in /kɑɾ/ 'profession' - /ǰɑɾ/ 'neighbour'.
23. k/ʃ as in /kəd/ 'he worked hard' - /ʃəd/ 'he tied'.
24. k/h̥ as in /kəd/ 'he worked hard' - /h̥əd/ 'limit (n.)'.
25. k/ʕ as in /kɑɾ/ 'profession' - /ʕɑɾ/ 'disgrace (n.)'.
26. k/? as in /kas/ 'cup' - /ʔas/ 'ace (in a game of cards)'.
27. k/h as in /kəd/ 'he worked hard' - /həd/ 'he let go'.
28. k/i as in /kas/ 'cup' - /ias/ 'privet'.
29. k/u as in /kəd/ 'he worked hard' - /uəd/ 'he liked'.

(b) In word-medial position, /a/ enters into the following distinctive oppositions:

1. k/b = b/k (see section 12.3 above).
2. k/f = f/k (see section 12.4 above).
3. k/m = m/k (see section 12.5 above).
4. k/ṁ = ṁ/k (see section 12.6 above).
5. k/t = t/k (see section 12.7 above).
6. k/d = d/k (see section 12.8 above).
7. k/ṭ = ṭ/k (see section 12.9 above).
8. k/θ = θ/k (see section 12.10 above).
9. k/ð = ð/k (see section 12.11 above).
10. k/ḍ = ḍ/k (see section 12.12 above).
11. k/g as in /'ʃɪkə/ 'he complained' - /'ʃɪgə/ 'he worked very hard'.
12. k/x as in /'ʔəkʊ/ 'there is' - /'ʔəxu/ 'brother'.
13. k/ɣ as in /'ʃakɪɾ/ 'boy's name' - /'ʃaɣɪɾ/ 'vacant'.
14. k/ḵ as in /'sɪkət/ 'he shut up' - /'sɪḵət/ 'she watered'.
15. k/n as in /'kəkə/ 'coke' - /'konə/ 'argument'.
16. k/r as in /'ʃəkʊə/ 'complaint' - /'ʃəruə/ 'buy (n.)'.
17. k/l as in /'xakɪ/ 'khaki' - /'xalɪ/ 'empty'.
18. k/ɭ as in /'xakɪ/ 'khaki' - /'xalɪ/ 'my maternal uncle'.
19. k/s as in /'ħɪkəm/ 'maxims' - /'ħɪsəm/ 'he settled (a case)'.
20. k/z as in /'ħakɪm/ 'judge (n.)' - /'ħazɪm/ 'decisive'.
21. k/ʂ as in /'ħtɪkər/ 'he monopolized' - /'ħtɪʂər/ 'he became depressed'.
22. k/č as in /'bakɪɾ/ 'virgin' - /'bačɪɾ/ 'tomorrow'.
23. k/ǵ as in /'ʃɪkər/ 'he thanked' - /'ʃɪǵər/ 'pumpkin (s)'.

24. k/ʃ as in /'nɪkəɹ/ 'he denied' - /'nɪʃəɹ/ 'he published'.
25. k/h as in /'sɪkəɹ/ 'he became drunk' - /'sɪhəɹ/ 'he fascinated'.
26. k/ʰ as in /'ʃəkəɹ/ 'sugar' - /'ʃəʰəɹ/ 'hair'.
27. k/? as in /'rɪkəs/ 'it or he went down' - /'rɪʰəs/ 'he headed or became Chairman'.
28. k/h as in /'sɪkəɹ/ 'he became drunk' - /'sɪhəɹ/ 'he stayed up late'.
29. k/i as in /'mɑkɪl/ '(he) having eaten' - /'maɪl/ 'bent'.
30. k/u as in /'ʃɑkɪɹ/ 'grateful' - /'ʃɑuɪɹ/ 'whisper!'

(c) In word-final position, /k/ enters into the following distinctive oppositions:

1. k/ɛ = ɛ/k (see section 12.4 above).
2. k/m = m/k (see section 12.5 above).
3. k/m̄ = m̄/k (see section 12.6 above).
4. k/t = t/k (see section 12.7 above).
5. k/d = d/k (see section 12.8 above).
6. k/t̄ = t̄/k (see section 12.9 above).
7. k/θ = θ/k (see section 12.10 above).
8. k/ð = ð/k (see section 12.11 above).
9. k/ð̄ = ð̄/k (see section 12.12 above).
10. k/g as in /ʃək/ 'suspicion' - /ʃəg/ 'tear (n.)'.
11. k/x as in /fək/ 'he opened' - /fəx/ 'trap (n.)'.
12. k/ɣ as in /'fʊrək/ 'he rubbed' - /'fʊrɛɣ/ 'it was empty'.
13. k/k̄ as in /hək/ 'he scratched' - /hək̄/ 'justice'.
14. k/n as in /hək/ 'he scratched' - /hən/ 'he longed (for)'.





#### 12.14. The Opposability of /g/.

The opposability of the phoneme /g/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /g/ enters into the following distinctive oppositions:

1. g/p = p/g (see section 12.2 above).
2. g/b = b/g (see section 12.3 above).
3. g/f = f/g (see section 12.4 above).
4. g/m = m/g (see section 12.5 above).
5. g/ṁ = ṁ/g (see section 12.6 above).
6. g/t = t/g (see section 12.7 above).
7. g/d = d/g (see section 12.8 above).
8. g/ṭ = ṭ/g (see section 12.9 above).
9. g/θ = θ/g (see section 12.10 above).
10. g/ð = ð/g (see section 12.11 above).
11. g/ḏ = ḏ/g (see section 12.12 above).
12. g/k = k/g (see section 12.13 above).
13. g/x as in /gas/ 'he touched' - /xas/ 'it went bad or spoiled'.
14. g/γ as in /gəṣ/ 'he cut off' - /γəṣ/ 'he choked'.
15. g/ḵ as in /gas/ 'he touched' - /ḵas/ 'he measured'.
16. g/n as in /gas/ 'he touched' - /nas/ 'people'.
17. g/r as in /gas/ 'he touched' - /ras/ 'head (n.)'.
18. g/s as in /gaḏ/ 'he held (sb.) by the hand' - /saḏ/ 'it or he prevailed'.
19. g/z as in /gaḏ/ 'he held (sb.) by the hand' - /zaḏ/ 'it increased'.

20. g/ʂ as in /gʌm/ 'he stood up' - /ʂʌm/ 'he fasted'.
21. g/č as in /gaɪ/ 'he said' - /čaɪ/ 'he measured out'.
22. g/ǵ as in /gaɪ/ 'he held (sb.) by the hand' - /ǵaɪ/ 'conscientious'.
23. g/ʃ as in /gaɪ/ 'he said' - /ʃaɪ/ 'he moved out'.
24. g/h̥ as in /gəd/ 'equal to' - /h̥əd/ 'limit (n.)'.
25. g/ʳ as in /gaɪ/ 'he held (sb.) by the hand' - /ʳaɪ/ 'he returned'.
26. g/? as in /gas/ 'he touched' - /ʔas/ 'ace (in a game of cards)'.
27. g/h̥ as in /gəd/ 'equal to' - /h̥əd/ 'he let go'.
28. g/i as in /gəd/ 'equal to' - /iəd/ 'hand (n.)'.
29. g/u as in /gəd/ 'equal to' - /uəd/ 'he liked'.

(b) In word-medial position, /g/ enters into the following distinctive oppositions:

1. g/b = b/g (see section 12.3 above).
2. g/f = f/g (see section 12.4 above).
3. g/m = m/g (see section 12.5 above).
4. g/ṃ = ṃ/g (see section 12.6 above).
5. g/t = t/g (see section 12.7 above).
6. g/d̥ = d̥/g (see section 12.8 above).
7. g/ṭ = ṭ/g (see section 12.9 above).
8. g/θ = θ/g (see section 12.10 above).
9. g/ð̥ = ð̥/g (see section 12.11 above).
10. g/ð̣ = ð̣/g (see section 12.12 above).
11. g/k = k/g (see section 12.13 above).

12. g/x as in /'səgɪ/ 'irrigation' - /'səxɪ/ 'generous'.
13. g/ɣ as in /'ʃɪgɛr/ 'eagle' - /'ʃɪɣɛr/ 'childhood'.
14. g/ħ as in /'ʕəgɪd/ 'narrow street' - /'ʕəħɪd/ 'contract (n.)'.
15. g/n as in /'sugə/ 'his market' - /'sunə/ 'boy's name'.
16. g/r as in /'bagə/ 'bunch' - /'barə/ 'his drinking bar'.
17. g/l as in /'bagə/ 'bunch' - /'balə/ 'his mind or brain'.
18. g/ɭ as in /'bagə/ 'bunch' - /'baɭə/ 'bale'.
19. g/s as in /'bagə/ 'bunch' - /'basə/ 'he kissed him'.
20. g/z as in /'bagə/ 'bunch' - /'bazə/ 'cotton fabric'.
21. g/ʂ as in /'nɪgɛr/ 'it or he tapped' - /'nɪʂɛr/ 'he granted victory to'.
22. g/č as in /'nəgɪr/ 'tapping (n.)' - /'nəčɪr/ 'defiant'.
23. g/ǧ as in /'nɪgɛr/ 'it or he tapped' - /'nɪǧɛr/ 'he chopped'.
24. g/ʃ as in /'nəgɪr/ 'tapping (n.)' - /'nəʃɪr/ 'publication'.
25. g/h as in /'nɪgɛr/ 'it or he tapped' - /'nɪhɛr/ 'he slaughtered'.
26. g/ʕ as in /'sɪgə/ 'he watered' - /'sɪʕə/ 'capacity'.
27. g/? as in /'sagət/ 'she drove or rode (an animal)' - /'saʔət/ 'it or she became worse'.
28. g/h as in /'sɪgə/ 'he watered' - /'sɪhə/ 'he was inattentive'.
29. g/i as in /'nagə/ 'female camel' - /'naiə/ 'his lute'.
30. g/u as in /'sagə/ 'he drove it' - /'sauə/ 'it or he equalled'.

(c) In word-final position, /g/ enters into the following distinctive oppositions:

1. g/ɛ = ɛ/g (see section 12.4 above).
2. g/m = m/g (see section 12.5 above).
3. g/ṁ = ṁ/g (see section 12.6 above).
4. g/t = t/g (see section 12.7 above).
5. g/d = d/g (see section 12.8 above).
6. g/ṭ = ṭ/g (see section 12.9 above).
7. g/θ = θ/g (see section 12.10 above).
8. g/ð = ð/g (see section 12.11 above).
9. g/ḑ = ḑ/g (see section 12.12 above).
10. g/k = k/g (see section 12.13 above).
11. g/x as in /ʃæg/ 'tear (n.)' - /ʃæx/ 'he urinated'.
12. g/ɣ as in /dæg/ 'he knocked' - /dæɣ/ 'he pinched (sb.) for attention'.
13. g/ḵ as in /dæg/ 'he knocked' - /dæḵ/ 'he sickened sb. (with irritation, etc.)'.
14. g/n as in /ʃæg/ 'tear (n.)' - /ʃæn/ 'he launched (an attack)'.
15. g/ɽ as in /ḑag/ 'he tasted' - /ḑaɽ/ 'harmful'.
16. g/l as in /bog/ 'stealing or robbing' - /boɭ/ 'urine'.
17. g/ɭ as in /bog/ 'stealing or robbing' - /boɭ/ 'ill-mannered woman'.
18. g/s as in /bag/ 'he stole or robbed' - /bas/ 'he kissed'.
19. g/z as in /dæg/ 'he knocked' - /dæz/ 'he sent'.
20. g/ʂ as in /bag/ 'he stole or robbed' - /baʂ/ 'bus'.
21. g/č as in /dæg/ 'he knocked' - /dæč/ 'packing (n.)'.
22. g/ǧ as in /ḑag/ 'he tasted' - /ḑaǧ/ 'he became bored'.

23. g/f as in /hæg/ 'right (n.)' - /həf/ 'he mowed the lawn'.  
 24. g/h as in /fæg/ 'tear (n.)' - /fəh/ 'it became scarce'.  
 25. g/s as in /fæg/ 'tear (n.)' - /fəs/ 'it or he shone'.  
 26. g/? as in /bag/ 'he stole or robbed' - /ba?/ 'the name of the letter "b"'.  
 27. g/h as in /fag/ '(he) having torn' - /fah/ 'Shah'.  
 28. g/i as in /hæg/ 'right (n.)' - /həi/ 'alive'.  
 29. g/u as in /hæg/ 'right (n.)' - /həu/ 'wild plant'.

### Summary:

The phoneme /g/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally; i.e. /g/ forms a total of 88 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.15. The Opposability of /x/.

The opposability of the phoneme /x/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /x/ enters into the following distinctive oppositions:

1. x/p = p/x (see section 12.2 above).
2. x/b = b/x (see section 12.3 above).
3. x/f = f/x (see section 12.4 above).
4. x/m = m/x (see section 12.5 above).
5. x/ṃ = ṃ/x (see section 12.6 above).

6. x/t = t/x (see section 12.7 above).
7. x/d = d/x (see section 12.8 above).
8. x/ɸ = ɸ/x (see section 12.9 above).
9. x/θ = θ/x (see section 12.10 above).
10. x/ð = ð/x (see section 12.11 above).
11. x/ð̥ = ð̥/x (see section 12.12 above).
12. x/k = k/x (see section 12.13 above).
13. x/g = g/x (see section 12.14 above).
14. x/ɣ as in /xəʃ/ 'he specified' - /ɣəʃ/ 'he choked'.
15. x/ç as in /xəs/ 'lettuce' - /çəs/ 'priest'.
16. x/n as in /xas/ 'it went bad or spoiled' - /nas/ 'people!'.
17. x/r as in /xas/ 'it went bad or spoiled' - /ras/ 'head (n.)'.
18. x/s as in /xal/ 'mole' - /sal/ 'it flowed'.
19. x/z as in /xal/ 'mole' - /zal/ 'it disappeared'.
20. x/ʃ as in /xəd/ 'cheek' - /ʃəd/ 'he threw back'.
21. x/č as in /xal/ 'mole' - /čal/ 'he measured out'.
22. x/ǵ as in /xər/ 'it leaked' - /ǵər/ 'he pulled'.
23. x/ʃ as in /xal/ 'mole' - /ʃal/ 'he moved out'.
24. x/h as in /xəs/ 'lettuce' - /həs/ 'he felt'.
25. x/ʃ as in /xəd/ 'cheek' - /ʃəd/ 'he counted'.
26. x/? as in /xas/ 'it went bad or spoiled' - /ʔas/ 'ace (in a game of cards)'.
27. x/h as in /xəd/ 'cheek' - /həd/ 'he let go'.
28. x/i as in /xas/ 'it went bad or spoiled' - /ias/ 'privet'.
29. x/u as in /xəd/ 'cheek' - /uəd/ 'he liked'.

(b) In word-medial position, /x/ enters into the following

distinctive oppositions:

1. x/b = b/x (see section 12.3 above).
2. x/f = f/x (see section 12.4 above).
3. x/m = m/x (see section 12.5 above).
4. x/ṁ = ṁ/x (see section 12.6 above).
5. x/t = t/x (see section 12.7 above).
6. x/d̄ = d̄/x (see section 12.8 above).
7. x/ṭ = ṭ/x (see section 12.9 above).
8. x/θ = θ/x (see section 12.10 above).
9. x/ð = ð/x (see section 12.11 above).
10. x/ḑ = ḑ/x (see section 12.12 above).
11. x/k = k/x (see section 12.13 above).
12. x/g = g/x (see section 12.14 above).
13. x/γ as in /'ʔəxbər/ 'he told' - /'ʔəybər/ 'dull'.
14. x/k̄ as in /'səxɪ/ 'generous' - /'sək̄ɪ/ 'irrigation'.
15. x/n as in /ʔə'xɪr/ 'final' - /ʔə'nɪr/ 'I light up (the way)'.
16. x/r as in /'sɪxə/ 'he was generous' - /'sɪrə/ 'turn (n.)'.
17. x/l as in /'ʃɪxə/ 'he was generous' - /'ʃɪlə/ 'relation'.
18. x/ḷ as in /'ʃɪxə/ 'he was generous' - /'ʃɪḷə/ 'he sprayed with gunfire'.
19. x/s as in /ʔə'xɪr/ 'final' - /ʔə'sɪr/ 'captive'.
20. x/z as in /ʔə'xur/ 'I go to various places' - /ʔə'zur/ 'I visit'.
21. x/š as in /ʔə'xɪr/ 'final' - /ʔə'ʃɪr/ 'I become'.
22. x/č as in /'rtɪxə/ 'it became loose' - /'rtičə/ 'he leant back'.

23. x/ǧ as in /'ʃixəɾ/ 'he snored' - /'ʃiǧəɾ/ 'pumpkin(s)'.
24. x/ʃ as in /'ɾixə/ 'it became loose' - /'ɾiʃə/ 'he bribed'.
25. x/h̄ as in /'sɪxəɾ/ 'he ridiculed' - /'sɪh̄əɾ/ 'he fascinated'.
26. x/ʕ as in /'ʃixəɾ/ 'he snored' - /'ʃiʕəɾ/ 'he felt'.
27. x/? as in /'ɾixə/ 'it became loose' - /'ɾi?ə/ 'lung'.
28. x/h as in /'ʃixəɾ/ 'he snored' - /'ʃihəɾ/ 'he made well-known'.
29. x/i as in /'ʔaxə/ 'he helped people to become friends' - /'ʔaiə / 'verse of the Koran'.
30. x/u as in /'ɾaxɪ/ 'loose' - /'ɾauɪ/ 'from Rawa (a town)'.

(c) In word-final position, /x/ enters into the following distinctive oppositions:

1. x/f = f/x (see section 12.4 above).
2. x/m = m/x (see section 12.5 above).
3. x/ṁ = ṁ/x (see section 12.6 above).
4. x/t = t/x (see section 12.7 above).
5. x/d = d/x (see section 12.8 above).
6. x/ṭ = ṭ/x (see section 12.9 above).
7. x/θ = θ/x (see section 12.10 above).
8. x/ð = ð/x (see section 12.11 above).
9. x/ḏ = ḏ/x (see section 12.12 above).
10. x/k = k/x (see section 12.13 above).
11. x/g = g/x (see section 12.14 above).
12. x/γ as in /ʃax/ 'he became self-important or pompous' - /ʃay/ 'he reacted emotionally to bad news'.



13. x/k as in /ʃax/ 'he became self-important or pompous' - /ʃak/ 'difficult'.
14. x/n as in /fəx/ 'trap (n.)' - /fən/ 'art'.
15. x/r as in /fəx/ 'trap (n.)' - /fər/ 'he eloped'.
16. x/l as in /ʃax/ 'he became self-important or pompous' - /ʃal/ 'he moved out'.
17. x/ɫ as in /ðəx/ 'pumping (n.)' - /ðəɫ/ 'it or he stayed'.
18. x/s as in /bax/ 'it became insipid' - /bas/ 'he kissed'.
19. x/z as in /fəx/ 'trap (n.)' - /fəz/ 'he woke up'.
20. x/ʃ as in /mʊx/ 'brain or mind' - /mʊʃ/ 'suck!'.
21. x/č as in /fəx/ 'trap (n.)' - /fəč/ 'jawbone'.
22. x/ǵ as in /ðəx/ '(he) having pumped' - /ðəǵ/ 'he became bored'.
23. x/ʃ as in /fəx/ 'trap (n.)' - /fəʃ/ 'it or he deflated'.
24. x/h as in /ʃəx/ 'he urinated' - /ʃəh/ 'it became scarce'.
25. x/ʃ as in /ʃəx/ 'he urinated' - /ʃəʃ/ 'it or he shone'.
26. x/? as in /ʃax/ 'he became self-important or pompous' - /ʃa?/ 'he wanted'.
27. x/h as in /ʃax/ 'he became self-important or pompous' - /ʃah/ 'Shah'.
28. x/i as in /fəx/ 'trap (n.)' - /fəi/ 'shade'.
29. x/u as in /?əx/ 'brother' - /?əu/ 'or'.

Summary:

The phoneme /x/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2

vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally; i.e. /x/ forms a total of 88 different distinctive oppositions within the SIA system of phonological oppositions.

#### 12.16. The Opposability of /ɣ/.

The opposability of the phoneme /ɣ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ɣ/ enters into the following distinctive oppositions:

1.  $\gamma/p = p/\gamma$  (see section 12.2 above).
2.  $\gamma/b = b/\gamma$  (see section 12.3 above).
3.  $\gamma/f = f/\gamma$  (see section 12.4 above).
4.  $\gamma/m = m/\gamma$  (see section 12.5 above).
5.  $\gamma/\text{ṁ} = \text{ṁ}/\gamma$  (see section 12.6 above).
6.  $\gamma/t = t/\gamma$  (see section 12.7 above).
7.  $\gamma/d = d/\gamma$  (see section 12.8 above).
8.  $\gamma/\text{ṭ} = \text{ṭ}/\gamma$  (see section 12.9 above).
9.  $\gamma/\theta = \theta/\gamma$  (see section 12.10 above).
10.  $\gamma/\delta = \delta/\gamma$  (see section 12.11 above).
11.  $\gamma/\deltạ = \deltạ/\gamma$  (see section 12.12 above).
12.  $\gamma/k = k/\gamma$  (see section 12.13 above).
13.  $\gamma/g = g/\gamma$  (see section 12.14 above).
14.  $\gamma/x = x/\gamma$  (see section 12.15 above).
15.  $\gamma/\text{ḳ} = \text{ḳ}/\gamma$  as in /ɣəṣ/ 'he choked' - /ḳəṣ/ 'he narrated or told (a story)'

16.  $\gamma/n$  as in / $\gamma\text{ə}\text{ʃ}$ / 'he choked' - / $n\text{ə}\text{ʃ}$ / 'text'.
17.  $\gamma/r$  as in / $\gamma\text{a}\text{d}$ / 'over there' - / $r\text{a}\text{d}$ / 'he wanted'.
18.  $\gamma/s$  as in / $\gamma\text{a}\text{d}$ / 'over there' - / $s\text{a}\text{d}$ / 'it prevailed'.
19.  $\gamma/z$  as in / $\gamma\text{a}\text{d}$ / 'over there' - / $z\text{a}\text{d}$ / 'it increased'.
20.  $\gamma/\text{ʃ}$  as in / $\gamma\text{a}\text{ʃ}$ / 'it or he dived' - / $\text{ʃ}\text{a}\text{ʃ}$ / 'sauce'.
21.  $\gamma/\check{c}$  as in / $\gamma\text{ai}\text{ə}$ / 'purpose' - / $\check{c}\text{ai}\text{ə}$ / 'his tea'.
22.  $\gamma/\check{g}$  as in / $\gamma\text{a}\text{d}$ / 'over there' - / $\check{g}\text{a}\text{d}$ / 'conscientious'.
23.  $\gamma/\text{ʃ}$  as in / $\gamma\text{e}\text{b}\text{ə}$ / 'absence' - / $\text{ʃ}\text{e}\text{b}\text{ə}$ / 'streak or touch of grey hair'.
24.  $\gamma/h$  as in / $\gamma\text{a}\text{d}$ / 'over there' - / $h\text{a}\text{d}$ / 'sharp (knife)'.
25.  $\gamma/\text{ʳ}$  as in / $\gamma\text{a}\text{d}$ / 'over there' - / $\text{ʳ}\text{a}\text{d}$ / 'he returned'.
26.  $\gamma/\text{ʔ}$  as in / $\gamma\text{ai}\text{ə}$ / 'purpose' - / $\text{ʔ}\text{ai}\text{ə}$ / 'verse of the Koran'.
27.  $\gamma/h$  as in / $\gamma\text{ai}\text{ə}$ / 'purpose' - / $h\text{ai}\text{ə}$ / 'this one (f.)'.
28.  $\gamma/i$  as in / $\gamma\text{ə}\text{d}\text{d}\text{ə}$ / 'he offered lunch (to sb.)' - / $i\text{ə}\text{d}\text{d}\text{ə}$ / 'handle (n.)'.
29.  $\gamma/u$  as in / $\gamma\text{ə}\text{d}\text{d}\text{ə}$ / 'he offered lunch (to sb.)' - / $u\text{ə}\text{d}\text{d}\text{ə}$ / 'he sent'.

(b) In word-medial position, / $\gamma$ / enters into the following distinctive oppositions:

1.  $\gamma/p = p/\gamma$  (see section 12.2 above).
2.  $\gamma/b = b/\gamma$  (see section 12.3 above).
3.  $\gamma/f = f/\gamma$  (see section 12.4 above).
4.  $\gamma/m = m/\gamma$  (see section 12.5 above).
5.  $\gamma/\text{ṃ} = \text{ṃ}/\gamma$  (see section 12.6 above).

6.  $\gamma/t = t/\gamma$  (see section 12.7 above).
7.  $\gamma/d = d/\gamma$  (see section 12.8 above).
8.  $\gamma/\text{t} = \text{t}/\gamma$  (see section 12.9 above).
9.  $\gamma/\theta = \theta/\gamma$  (see section 12.10 above).
10.  $\gamma/\delta = \delta/\gamma$  (see section 12.11 above).
11.  $\gamma/\delta = \delta/\gamma$  (see section 12.12 above).
12.  $\gamma/k = k/\gamma$  (see section 12.13 above).
13.  $\gamma/g = g/\gamma$  (see section 12.14 above).
14.  $\gamma/x = x/\gamma$  (see section 12.15 above).
15.  $\gamma/\text{k}$  as in  $/b\theta'\gamma a^?/$  'prostitution' -  $/b\theta'\text{k} a^?/$  'survival'.
16.  $\gamma/n$  as in  $/'b\ddot{u}\gamma i\theta/$  'desired object' -  $/'b\ddot{u}n i\theta/$  'physique'.
17.  $\gamma/r$  as in  $/'b a\gamma\theta/$  'plastic' -  $/'b a r\theta/$  'his drinking bar'.
18.  $\gamma/l$  as in  $/'b a\gamma\theta/$  'plastic' -  $/'b a l\theta/$  'his mind or brain'.
19.  $\gamma/l$  as in  $/'b a\gamma\theta/$  'plastic' -  $/'b a l\theta/$  'bale'.
20.  $\gamma/s$  as in  $/'b a\gamma\theta/$  'plastic' -  $/'b a s\theta/$  'he kissed him'.
21.  $\gamma/z$  as in  $/'b a\gamma\theta/$  'plastic' -  $/'b a z\theta/$  'cotton fabric'.
22.  $\gamma/\text{s}$  as in  $/'\text{s} a\gamma\theta/$  'he worded it' -  $/'\text{s} a \text{s}\theta/$  'his sauce'.
23.  $\gamma/\text{č}$  as in  $/'b a\gamma\theta/$  'plastic' -  $/'b a \text{č}\theta/$  'calf of the leg'.
24.  $\gamma/\text{ğ}$  as in  $/'j i\gamma\theta r/$  'it was vacant' -  $/'j i\text{ğ}\theta r/$  'pumpkin(s)'.
25.  $\gamma/\text{f}$  as in  $/'n a\gamma\theta/$  'he spoke softly' -  $/'n a f\theta/$  'he reached it or him'.
26.  $\gamma/\text{h}$  as in  $/'\text{s} a\gamma\theta/$  'he worded it' -  $/'\text{s} a \text{h}\theta/$  'he called for him'.
27.  $\gamma/\text{c}$  as in  $/'b a\gamma\theta/$  'plastic' -  $/'b a \text{c}\theta/$  'he sold it'.
28.  $\gamma/?$  as in  $/'j a\gamma\theta t/$  'she reacted emotionally to bad news' -  $/'j a^? \theta t/$  'she wanted'.

29.  $\gamma/h$  as in /'baya/ 'plastic' - /'bahə/ 'he boasted'.  
 30.  $\gamma/i$  as in /'şaya/ 'he worded it' - /'şaiə/ 'smock'.  
 31.  $\gamma/u$  as in /'fayır/ 'vacant' - /'fauır/ 'whisper!'.

(c) In word-final position, / $\gamma$ / enters into the following distinctive oppositions:

1.  $\gamma/f = f/\gamma$  (see section 12.4 above).
2.  $\gamma/m = m/\gamma$  (see section 12.5 above).
3.  $\gamma/m̥ = m̥/\gamma$  (see section 12.6 above).
4.  $\gamma/t = t/\gamma$  (see section 12.7 above).
5.  $\gamma/d = d/\gamma$  (see section 12.8 above).
6.  $\gamma/t̥ = t̥/\gamma$  (see section 12.9 above).
7.  $\gamma/\theta = \theta/\gamma$  (see section 12.10 above).
8.  $\gamma/\delta = \delta/\gamma$  (see section 12.11 above).
9.  $\gamma/\deltḁ = \deltḁ/\gamma$  (see section 12.12 above).
10.  $\gamma/k = k/\gamma$  (see section 12.13 above).
11.  $\gamma/g = g/\gamma$  (see section 12.14 above).
12.  $\gamma/x = x/\gamma$  (see section 12.15 above).
13.  $\gamma/k̥$  as in /fay/ 'he reacted emotionally to bad news' - /fak̥/ 'difficult'.
14.  $\gamma/n$  as in /şay/ 'he worded' - /şan/ 'he respected and protected'.
15.  $\gamma/r$  as in /şay/ 'he worded' - /şar/ 'he became'.
16.  $\gamma/l$  as in /fay/ 'he reacted emotionally to bad news' - /fal/ 'he moved out'.
17.  $\gamma/s$  as in /dəy/ 'he pinched (sb.) for attention' - /dəs/ 'insinuation'.

18.  $\gamma/z$  as in /də $\gamma$ / 'he pinched (sb.) for attention' - /dəz/ 'he sent'.
19.  $\gamma/\zeta$  as in /ʂa $\gamma$ / 'he worded' - /ʂa $\zeta$ / 'sauce'.
20.  $\gamma/\check{c}$  as in /də $\gamma$ / 'he pinched (sb.) for attention' - /də $\check{c}$ / 'packing (n.)'.
21.  $\gamma/\check{g}$  as in /ʂa $\gamma$ / 'he worded' - /ʂa $\check{g}$ / 'teakwood'.
22.  $\gamma/\jmath$  as in /ʃa $\gamma$ / 'he reacted emotionally to bad news' - /ʃa $\jmath$ / 'cheescloth'.
23.  $\gamma/\hbar$  as in /ʂa $\gamma$ / 'he worded' - /ʂa $\hbar$ / 'he shouted'.
24.  $\gamma/\text{ʃ}$  as in /ʃa $\gamma$ / 'he reacted emotionally to bad news' - /ʃa $\text{ʃ}$ / 'it became widespread'.
25.  $\gamma/?$  as in /ʃa $\gamma$ / 'he reacted emotionally to bad news' - /ʃa $?$ / 'he wanted'.
26.  $\gamma/h$  as in /ʃa $\gamma$ / 'he reacted emotionally to bad news' - /ʃa $h$ / 'Shah'.
27.  $\gamma/i$  as in /ʂa $\gamma$ / 'he worded' - /ʂa $i$ / 'piece (in a game of dominoes or backgammon)'.
28.  $\gamma/u$  as in /'bɪlə $\gamma$ / 'it came to' - /'bɪlə $u$ / 'they accused'.

### Summary

The phoneme / $\gamma$ / is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 29 consonant phonemes and 2 vowel phonemes word-medially, and 26 consonant phonemes and 2 vowel phonemes word-finally; i.e. / $\gamma$ / forms a total of 88 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.17. The Opposability of /ḳ/.

The opposability of the phoneme /ḳ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ḳ/ enters into the following distinctive oppositions:

1. ḳ/p = p/ḳ (see section 12.2 above).
2. ḳ/b = b/ḳ (see section 12.3 above).
3. ḳ/f = f/ḳ (see section 12.4 above).
4. ḳ/m = m/ḳ (see section 12.5 above).
5. ḳ/ṃ = ṃ/ḳ (see section 12.6 above).
6. ḳ/t = t/ḳ (see section 12.7 above).
7. ḳ/d = d/ḳ (see section 12.8 above).
8. ḳ/ṭ = ṭ/ḳ (see section 12.9 above).
9. ḳ/θ = θ/ḳ (see section 12.10 above).
10. ḳ/ð = ð/ḳ (see section 12.11 above).
11. ḳ/ḏ = ḏ/ḳ (see section 12.12 above).
12. ḳ/k = k/ḳ (see section 12.13 above).
13. ḳ/g = g/ḳ (see section 12.14 above).
14. ḳ/x = x/ḳ (see section 12.15 above).
15. ḳ/γ = γ/ḳ (see section 12.16 above).
16. ḳ/n as in /ḳas/ 'he measured' - /nas/ 'people'.
17. ḳ/r as in /ḳas/ 'he measured' - /ras/ 'head (n.)'.
18. ḳ/s as in /ḳəd/ 'perhaps' - /səd/ 'dam'.
19. ḳ/z as in /ḳad/ 'he led' - /zad/ 'it increased'.
20. ḳ/š as in /ḳəd/ 'perhaps' - /šəd/ 'he threw back'.
21. ḳ/č as in /ḳəd/ 'perhaps' - /čəd/ 'he worked hard'.

22.  $\text{ɔ̣}/\text{g}$  as in  $/\text{ɔ̣}ad/$  'he led' -  $/\text{g}ad/$  'conscientious'.
23.  $\text{ɔ̣}/\text{ʃ}$  as in  $/\text{ɔ̣}əd/$  'perhaps' -  $/\text{ʃ}əd/$  'he tied'.
24.  $\text{ɔ̣}/\text{h}$  as in  $/\text{ɔ̣}əd/$  'perhaps' -  $/\text{h}əd/$  'limit (n.)'.
25.  $\text{ɔ̣}/\text{ʃ}$  as in  $/\text{ɔ̣}əd/$  'perhaps' -  $/\text{ʃ}əd/$  'he counted'.
26.  $\text{ɔ̣}/\text{ʔ}$  as in  $/\text{ɔ̣}as/$  'he measured' -  $/\text{ʔ}as/$  'ace (in a game of cards)'.
27.  $\text{ɔ̣}/\text{h}$  as in  $/\text{ɔ̣}əd/$  'perhaps' -  $/\text{h}əd/$  'he let go'.
28.  $\text{ɔ̣}/\text{i}$  as in  $/\text{ɔ̣}əd/$  'perhaps' -  $/\text{i}əd/$  'hand (n.)'.
29.  $\text{ɔ̣}/\text{u}$  as in  $/\text{ɔ̣}əd/$  'perhaps' -  $/\text{u}əd/$  'he liked'.

(b) In word-medial position,  $/\text{ɔ̣}/$  enters into the following distinctive oppositions:

1.  $\text{ɔ̣}/\text{b} = \text{b}/\text{ɔ̣}$  (see section 12.3 above).
2.  $\text{ɔ̣}/\text{f} = \text{f}/\text{ɔ̣}$  (see section 12.4 above).
3.  $\text{ɔ̣}/\text{m} = \text{m}/\text{ɔ̣}$  (see section 12.5 above).
4.  $\text{ɔ̣}/\text{m̥} = \text{m̥}/\text{ɔ̣}$  (see section 12.6 above).
5.  $\text{ɔ̣}/\text{t} = \text{t}/\text{ɔ̣}$  (see section 12.7 above).
6.  $\text{ɔ̣}/\text{d} = \text{d}/\text{ɔ̣}$  (see section 12.8 above).
7.  $\text{ɔ̣}/\text{t̥} = \text{t̥}/\text{ɔ̣}$  (see section 12.9 above).
8.  $\text{ɔ̣}/\text{θ} = \text{θ}/\text{ɔ̣}$  (see section 12.10 above).
9.  $\text{ɔ̣}/\text{ð} = \text{ð}/\text{ɔ̣}$  (see section 12.11 above).
10.  $\text{ɔ̣}/\text{ð̥} = \text{ð̥}/\text{ɔ̣}$  (see section 12.12 above).
11.  $\text{ɔ̣}/\text{k} = \text{k}/\text{ɔ̣}$  (see section 12.13 above).
12.  $\text{ɔ̣}/\text{g} = \text{g}/\text{ɔ̣}$  (see section 12.14 above).
13.  $\text{ɔ̣}/\text{x} = \text{x}/\text{ɔ̣}$  (see section 12.15 above).
14.  $\text{ɔ̣}/\text{ɣ} = \text{ɣ}/\text{ɔ̣}$  (see section 12.16 above).
15.  $\text{k}/\text{n}$  as in  $/\text{ʃ}a\text{ɔ̣}əd/$  'he signed a contract' -  $/\text{ʃ}a\text{n}əd/$  'he was stubborn'.



16. k/r as in /'sɪkə/ 'he watered' - /'sɪrə/ 'turn (n.)'.
17. k/l as in /'bəkə/ 'bunch' - /'balə/ 'his mind or brain'.
18. k/ɫ as in /'bəkə/ 'bunch' - /'balə/ 'bale'.
19. k/s as in /'hɪkəd/ 'he begrudged' - /'hɪsəd/ 'he envied'.
20. k/z as in /'sə'kɪmə/ 'sterile (f. sing.)' - /'sə'zɪmə/ 'invitation'.
21. k/ʃ as in /'htɪkər/ 'he despised' - /'htɪʃər/ 'he became depressed'.
22. k/č as in /'bəkə/ 'bunch' - /'bačə/ 'calf of the leg'.
23. k/ǵ as in /'ðəkət/ 'it became narrow' - /'ðəǵət/ 'she became bored'.
24. k/ʃ as in /'bəkər/ 'cows' - /'bəʃər/ 'humans'.
25. k/h as in /'bəkər/ 'cows' - /'bəhər/ 'sea'.
26. k/ʃ as in /'ðəkət/ 'it became narrow' - /'ðəʃət/ 'it or she was lost'.
27. k/? as in /'ðəkət/ 'it became narrow' - /'ðəʔət/ 'it lit up'.
28. k/h as in /'sə'kɪl/ 'smooth' - /'sə'hɪl/ 'neighing (n.)'.
29. k/i as in /'səkəd/ 'he signed a contract' - /'saiəd/ 'he exchanged greetings'.
30. k/u as in /'səkəd/ 'he signed a contract' - /'sauəd/ 'he resumed'.

(c) In word-final position, /k/ enters into the following distinctive oppositions:

1. k/ɸ = ɸ/k (see section 12.4 above)..
2. k/m = m/k (see section 12.5 above).

3.  $\text{ḳ}/\text{ṃ} = \text{ṃ}/\text{ḳ}$  (see section 12.6 above).
4.  $\text{ḳ}/\text{ṭ} = \text{ṭ}/\text{ḳ}$  (see section 12.7 above).
5.  $\text{ḳ}/\text{ḍ} = \text{ḍ}/\text{ḳ}$  (see section 12.8 above).
6.  $\text{ḳ}/\text{ṭṭ} = \text{ṭṭ}/\text{ḳ}$  (see section 12.9 above).
7.  $\text{ḳ}/\text{ḫ} = \text{ḫ}/\text{ḳ}$  (see section 12.10 above).
8.  $\text{ḳ}/\text{ḏ} = \text{ḏ}/\text{ḳ}$  (see section 12.11 above).
9.  $\text{ḳ}/\text{ḏḏ} = \text{ḏḏ}/\text{ḳ}$  (see section 12.12 above).
10.  $\text{ḳ}/\text{k} = \text{k}/\text{ḳ}$  (see section 12.13 above).
11.  $\text{ḳ}/\text{g} = \text{g}/\text{ḳ}$  (see section 12.14 above).
12.  $\text{ḳ}/\text{x} = \text{x}/\text{ḳ}$  (see section 12.15 above).
13.  $\text{ḳ}/\text{γ} = \text{γ}/\text{ḳ}$  (see section 12.16 above).
14.  $\text{ḳ}/\text{n}$  as in  $/\text{ḥ}\text{ə}\text{ḳ}/$  'justice' -  $/\text{ḥ}\text{ə}\text{n}/$  'he longed for'.
15.  $\text{ḳ}/\text{r}$  as in  $/\text{ḥ}\text{ə}\text{ḳ}/$  'justice' -  $/\text{ḥ}\text{ə}\text{r}/$  'hot weather'.
16.  $\text{ḳ}/\text{l}$  as in  $/\text{ḥ}\text{ə}\text{ḳ}/$  'justice' -  $/\text{ḥ}\text{ə}\text{l}/$  'solution'.
17.  $\text{ḳ}/\text{s}$  as in  $/\text{ḥ}\text{ə}\text{ḳ}/$  'justice' -  $/\text{ḥ}\text{ə}\text{s}/$  'he felt'.
18.  $\text{ḳ}/\text{z}$  as in  $/\text{ḥ}\text{ə}\text{ḳ}/$  'justice' -  $/\text{ḥ}\text{ə}\text{z}/$  'notch (n.)'.
19.  $\text{ḳ}/\text{ṣ}$  as in  $/\text{r}\text{ə}\text{ḳ}/$  'it or he softened' -  $/\text{r}\text{ə}\text{ṣ}/$  'he pressed together'.
20.  $\text{ḳ}/\text{č}$  as in  $/\text{d}\text{ə}\text{ḳ}/$  'it or he irritated' -  $/\text{d}\text{ə}\text{č}/$  'packing (n.)'.
21.  $\text{ḳ}/\text{ğ}$  as in  $/\text{ḥ}\text{ə}\text{ḳ}/$  'justice' -  $/\text{ḥ}\text{ə}\text{ğ}/$  'he made the pilgrimage (to Mecca)'.
22.  $\text{ḳ}/\text{ʃ}$  as in  $/\text{ʃ}\text{ə}\text{ḳ}/$  'difficult' -  $/\text{ʃ}\text{ə}\text{ʃ}/$  'cheesecloth'.
23.  $\text{ḳ}/\text{ḥ}$  as in  $/\text{ʃ}\text{ə}\text{ḳ}/$  'difficult' -  $/\text{ʃ}\text{ə}\text{ḥ}/$  '(it) having become scarce'.
24.  $\text{ḳ}/\text{ʕ}$  as in  $/\text{ð}\text{ə}\text{ḳ}/$  'it became narrow' -  $/\text{ð}\text{ə}\text{ʕ}/$  'it was lost'.
25.  $\text{ḳ}/\text{ʔ}$  as in  $/\text{ʃ}\text{ə}\text{ḳ}/$  'difficult' -  $/\text{ʃ}\text{ə}\text{ʔ}/$  'he wanted'.

26.  $\text{ɰ}/\text{h}$  as in  $/\text{ʃaɰ}/$  'difficult' -  $/\text{ʃah}/$  'Shah'.
27.  $\text{ɰ}/\text{i}$  as in  $/\text{həɰ}/$  'justice' -  $/\text{həi}/$  'alive'.
28.  $\text{ɰ}/\text{u}$  as in  $/\text{həɰ}/$  'justice' -  $/\text{həu}/$  'wild plant'.

Summary:

The phoneme  $/\text{ɰ}/$  is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 26 consonant phonemes and 2 vowel phonemes word-finally; i.e.  $/\text{ɰ}/$  forms a total of 87 different distinctive oppositions within the SIA system of phonological oppositions.

12.18. The Opposability of  $/\text{n}/$ .

The opposability of the phoneme  $/\text{n}/$  within the SIA system of phonological oppositions is as follows:

(a) In word-initial position,  $/\text{n}/$  enters into the following distinctive oppositions:

1.  $\text{n}/\text{p} = \text{p}/\text{n}$  (see section 12.2 above).
2.  $\text{n}/\text{b} = \text{b}/\text{n}$  (see section 12.3 above).
3.  $\text{n}/\text{f} = \text{f}/\text{n}$  (see section 12.4 above).
4.  $\text{n}/\text{m} = \text{m}/\text{n}$  (see section 12.5 above).
5.  $\text{n}/\text{m̥} = \text{m̥}/\text{n}$  (see section 12.6 above).
6.  $\text{n}/\text{t} = \text{t}/\text{n}$  (see section 12.7 above).
7.  $\text{n}/\text{d} = \text{d}/\text{n}$  (see section 12.8 above).
8.  $\text{n}/\text{t̥} = \text{t̥}/\text{n}$  (see section 12.9 above).
9.  $\text{n}/\text{θ} = \text{θ}/\text{n}$  (see section 12.10 above).
10.  $\text{n}/\text{ð} = \text{ð}/\text{n}$  (see section 12.11 above).

11. n/ð = ð/n (see section 12.12 above).
12. n/k = k/n (see section 12.13 above).
13. n/g = g/n (see section 12.14 above).
14. n/x = x/n (see section 12.15 above).
15. n/ɣ = ɣ/n (see section 12.16 above).
16. n/ɣ̣ = ɣ̣/n (see section 12.17 above).
17. n/r as in /nas/ 'people' - /ras/ 'head (n.)'.
18. n/s as in /nam/ 'he slept' - /sam/ 'poisonous'.
19. n/z as in /nar/ 'fire (n.)' - /zar/ 'he visited'.
20. n/ʂ as in /nar/ 'fire (n.)' - /ʂar/ 'he became'.
21. n/č as in /'nadır/ 'scarce' - /'čadır/ 'tent'.
22. n/ǧ as in /nar/ 'fire (n.)' - /ǧar/ 'neighbour'.
23. n/ʃ as in /nuʃ/ 'half' - /ʃuʃ/ 'fish-hook'.
24. n/h̥ as in /nar/ 'fire (n.)' - /nar/ 'hot'.
25. n/r̥ as in /nar/ 'fire (n.)' - /r̥ar/ 'disgrace (n.)'.
26. n/? as in /nas/ 'people' - /pas/ 'ace (in a game of cards)'.
27. n/h̥ as in /'nuuə/ 'stones' - /'huuə/ 'he loved'.
28. n/i as in /nom/ 'sleep (n.)' - /iom/ 'day'.
29. n/u as in /'niǧəd/ 'he rescued' - /'uǧəd/ 'he found'.

(b) In word-medial position, /n/ enters into the following distinctive oppositions:

1. n/p = p/n (see section 12.2 above).
2. n/b = b/n (see section 12.3 above).
3. n/f = f/n (see section 12.4 above).
4. n/m = m/n (see section 12.5 above).

5. n/m̄ = m̄/n (see section 12.6 above).
6. n/t = t/n (see section 12.7 above).
7. n/d̄ = d̄/n (see section 12.8 above).
8. n/ṭ = ṭ/n (see section 12.9 above).
9. n/θ = θ/n (see section 12.10 above).
10. n/ð̄ = ð̄/n (see section 12.11 above).
11. n/ð̆ = ð̆/n (see section 12.12 above).
12. n/k = k/n (see section 12.13 above).
13. n/g = g/n (see section 12.14 above).
14. n/x = x/n (see section 12.15 above).
15. n/γ = γ/n (see section 12.16 above).
16. n/ḵ = ḵ/n (see section 12.17 above).
17. n/r as in /'θənɪ/ 'folding (n.)' - /'θəɪɪ/ 'wealthy'.
18. n/l as in /'ʃanə/ 'he suffered' - /'ʃalə/ 'burden'.
19. n/ɭ as in /'xanə/ 'he betrayed him' - /'xalə/ 'maternal aunt'.
20. n/s as in /'fɪnə/ 'he destroyed' - /'fɪsə/ 'he broke wind noiselessly'.
21. n/z as in /'ʃanə/ 'he suffered' - /'ʃazə/ 'need (n.)'.
22. n/ʃ as in /'ʃanɪ/ 'from Ana (a town)' - /'ʃaʃɪ/ 'stuck'.
23. n/č as in /'bɪnə/ 'he built' - /'bɪčə/ 'he cried'.
24. n/ǧ as in /'ʃanə/ 'he suffered' - /'ʃaǧə/ 'his ivory'.
25. n/ʃ as in /ʔɪ'narə/ 'lighting (n.)' - /ʔɪ'ʃarə/ 'signal (n.)'.
26. n/h̄ as in /'ʃanət/ 'she respected and protected' - /'ʃaħət/ 'she shouted'.
27. n/ʃ̄ as in /'bɪnə/ 'in us' - /'bɪʃ̄ə/ 'sell it!'.
28. n/? as in /'fɪnə/ 'he destroyed' - /'fɪ?ə/ 'group of people'.

29. n/h as in /'sʌnə/ 'he suffered' - /'sʌhə/ 'defect'.  
 30. n/i as in /'sʌnəd/ 'he was stubborn' - /'sʌiəd/ 'he exchanged feast greetings'.  
 31. n/u as in /'xʌnə/ 'he betrayed him' - /'xʌuə/ 'protection money'.

(c) In word-final position, /n/ enters into the following distinctive oppositions:

1. n/f = f/n (see section 12.4 above).
2. n/m = m/n (see section 12.5 above).
3. n/ṃ = ṃ/n (see section 12.6 above).
4. n/t = t/n (see section 12.7 above).
5. n/d = d/n (see section 12.8 above).
6. n/ṭ = ṭ/n (see section 12.9 above).
7. n/θ = θ/n (see section 12.10 above).
8. n/ð = ð/n (see section 12.11 above).
9. n/ḏ = ḏ/n (see section 12.12 above).
10. n/k = k/n (see section 12.13 above).
11. n/g = g/n (see section 12.14 above).
12. n/x = x/n (see section 12.15 above).
13. n/ɣ = ɣ/n (see section 12.16 above).
14. n/ḵ = ḵ/n (see section 12.17 above).
15. n/r as in /hən/ 'he longed for' - /hər/ 'hot weather'.
16. n/l as in /hən/ 'he longed for' - /həl/ 'solution'.
17. n/ɺ as in /xən/ 'he spoke nasally' - /xəl/ 'vinegar'.
18. n/s as in /xən/ 'he spoke nasally' - /xəs/ 'lettuce'.
19. n/z as in /hən/ 'he longed for' - /həz/ 'notch (n.)'.



(a) In word-initial position, /r/ enters into the following distinctive oppositions:

1. r/p = p/r (see section 12.2 above).
2. r/b = b/r (see section 12.3 above).
3. r/f = f/r (see section 12.4 above).
4. r/m = m/r (see section 12.5 above).
5. r/ṁ = ṁ/r (see section 12.6 above).
6. r/t = t/r (see section 12.7 above).
7. r/d̥ = d̥/r (see section 12.8 above).
8. r/ṭ = ṭ/r (see section 12.9 above).
9. r/θ = θ/r (see section 12.10 above).
10. r/ð = ð/r (see section 12.11 above).
11. r/ð̥ = ð̥/r (see section 12.12 above).
12. r/k = k/r (see section 12.13 above).
13. r/g = g/r (see section 12.14 above).
14. r/x = x/r (see section 12.15 above).
15. r/γ = γ/r (see section 12.16 above).
16. r/κ = κ/r (see section 12.17 above).
17. r/n = n/r (see section 12.18 above).
18. r/s as in /rəd/ 'reply (n.)' - /səd/ 'dam'.
19. r/z as in /rad/ 'he wanted' - /zad/ 'it increased'.
20. r/ʃ as in /raħ/ 'it or he went' - /ʃaħ/ 'he shouted'.
21. r/č as in /rəd/ 'reply (n.)' - /čəd/ 'he worked hard'.
22. r/ǵ as in /rad/ 'he wanted' - /ǵad/ 'conscientious'.
23. r/ʃ as in /rəd/ 'reply (n.)' - /ʃəd/ 'he tied'.
24. r/h̥ as in /rəd/ 'reply (n.)' - /h̥əd/ 'limit (n.)'.



25.  $r/\text{r}$  as in /rəd/ 'reply (n.)' - /rəd/ 'he counted'.
26.  $r/\text{h}$  as in /ras/ 'head (n.)' - /ʔas/ 'ace (in a game of cards)'.
27.  $r/\text{h}$  as in /rəd/ 'reply (n.)' - /həd/ 'he let go'.
28.  $r/\text{i}$  as in /ras/ 'head (n.)' - /iää/ 'privet'.
29.  $r/\text{u}$  as in /rəd/ 'reply (n.)' - /uəd/ 'he liked'.

(b) In word-medial position, /r/ enters into the following distinctive oppositions:

1.  $r/\text{p} = \text{p}/r$  (see section 12.2 above).
2.  $r/\text{b} = \text{b}/r$  (see section 12.3 above).
3.  $r/\text{f} = \text{f}/r$  (see section 12.4 above).
4.  $r/\text{m} = \text{m}/r$  (see section 12.5 above).
5.  $r/\text{m̥} = \text{m̥}/r$  (see section 12.6 above).
6.  $r/\text{t} = \text{t}/r$  (see section 12.7 above).
7.  $r/\text{d} = \text{d}/r$  (see section 12.8 above).
8.  $r/\text{t̥} = \text{t̥}/r$  (see section 12.9 above).
9.  $r/\text{θ} = \text{θ}/r$  (see section 12.10 above).
10.  $r/\text{ð} = \text{ð}/r$  (see section 12.11 above).
11.  $r/\text{ð̥} = \text{ð̥}/r$  (see section 12.12 above).
12.  $r/\text{k} = \text{k}/r$  (see section 12.13 above).
13.  $r/\text{g} = \text{g}/r$  (see section 12.14 above).
14.  $r/\text{x} = \text{x}/r$  (see section 12.15 above).
15.  $r/\text{γ} = \text{γ}/r$  (see section 12.16 above).
16.  $r/\text{k̥} = \text{k̥}/r$  (see section 12.17 above).
17.  $r/\text{n} = \text{n}/r$  (see section 12.18 above).

18. r/l as in /'sɪræg/ 'he sweated' - /'sɪlæg/ 'he set on fire'.
19. r/ɫ as in /'bærə/ 'his drinking bar' - /'baɫə/ 'bale'.
20. r/s as in /'færʊ/ 'fur' - /'fæsʊ/ 'soundless breaking wind'.
21. r/z as in /'sɪræf/ 'he knew' - /'sɪzæf/ 'he played (a musical instrument)'.
22. r/ʃ as in /'særɪ/ 'naked' - /'sɑʃɪ/ 'stuck'.
23. r/č as in /'ʃurə/ 'picture' - /'ʃučə/ 'his fault'.
24. r/ǵ as in /'særɪ/ 'naked' - /'sɑǵɪ/ 'ivory(adj.)'.
25. r/ʃ as in /'sɪræg/ 'he sweated' - /'sɪʃæg/ 'he fell passionately in love'.
26. r/h as in /ʃə'rih/ 'frank' - /ʃə'hɪh/ 'correct (adj.)'.
27. r/ʃ as in /bə'rið/ 'mail (n.)' - /bə'ʃid/ 'far'.
28. r/? as in /mæʃ'ruŋ/ 'cleaved' - /mæʃ'?uŋ/ 'unlucky'.
29. r/h as in /'særə/ 'his disgrace' - /'sahə/ 'defect'.
30. r/i as in /'nærə/ 'his fire' - /'naiə/ 'his lute'.
31. r/u as in /'iɪsrə/ 'left (adj.)' - /'iɪsuə/ 'worthy'.

(c) In word-final position, /r/ enters into the following distinctive oppositions:

1. r/ɸ = ɸ/r (see section 12.4 above).
2. r/m = m/r (see section 12.5 above).
3. r/ṃ = ṃ/r (see section 12.6 above).
4. r/t = t/r (see section 12.7 above).
5. r/d = d/r (see section 12.8 above).
6. r/ṭ = ṭ/r (see section 12.9 above).

7.  $r/\theta = \theta/r$  (see section 12.10 above).
8.  $r/\delta = \delta/r$  (see section 12.11 above).
9.  $r/\delta = \delta/r$  (see section 12.12 above).
10.  $r/k = k/r$  (see section 12.13 above).
11.  $r/g = g/r$  (see section 12.14 above).
12.  $r/x = x/r$  (see section 12.15 above).
13.  $r/\gamma = \gamma/r$  (see section 12.16 above).
14.  $r/\kappa = \kappa/r$  (see section 12.17 above).
15.  $r/n = n/r$  (see section 12.18 above).
16.  $r/l$  as in  $/h\acute{e}r/$  'hot weather' -  $/h\acute{e}l/$  'solution'.
17.  $r/l$  as in  $/x\acute{e}r/$  'it leaked' -  $/x\acute{e}l/$  'vinegar'.
18.  $r/s$  as in  $/d\acute{a}r/$  'house' -  $/d\acute{a}s/$  'he trod (on)'.
19.  $r/z$  as in  $/h\acute{e}r/$  'hot weather' -  $/h\acute{e}z/$  'notch (n.)'.
20.  $r/\acute{s}$  as in  $/x\acute{e}r/$  'it leaked' -  $/x\acute{e}\acute{s}/$  'he specified'.
21.  $r/\acute{c}$  as in  $/f\acute{e}r/$  'he eloped' -  $/f\acute{e}\acute{c}/$  'jawbone'.
22.  $r/\acute{g}$  as in  $/h\acute{e}r/$  'hot weather' -  $/h\acute{e}\acute{g}/$  'he made the pilgrimage (to Mecca)'.
23.  $r/\acute{j}$  as in  $/x\acute{e}r/$  'it leaked' -  $/x\acute{e}\acute{j}/$  'it or he entered'.
24.  $r/h$  as in  $/\acute{s}ar/$  'he became' -  $/\acute{s}ah/$  'he shouted'.
25.  $r/\acute{c}$  as in  $/\acute{g}ar/$  'neighbour' -  $/\acute{g}a\acute{c}/$  'he felt hungry'.
26.  $r/?$  as in  $/sur/$  'fence' -  $/su?/$  'evil (n.)'.
27.  $r/h$  as in  $/\acute{g}ar/$  'neighbour' -  $/\acute{g}ah/$  'dignity'.
28.  $r/i$  as in  $/h\acute{e}r/$  'hot weather' -  $/h\acute{e}i/$  'alive'.
29.  $r/u$  as in  $/h\acute{e}r/$  'hot weather' -  $/h\acute{e}u/$  'wild plant'.

Summary:

The phoneme /r/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 29 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally; i.e. /r/ forms a total of 89 different distinctive oppositions within the SIA system of phonological oppositions.

12.20: The Opposability of /l/.

The opposability of the phoneme /l/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /l/ is not opposable to any of the SIA phonemes since it never occurs in this position.

(b) In word-medial position, /l/ enters into the following distinctive oppositions:

1. 1/p = p/l (see section 12.2 above).
2. 1/b = b/l (see section 12.3 above).
3. 1/f = f/l (see section 12.4 above).
4. 1/m = m/l (see section 12.5 above).
5. 1/ṃ = ṃ/l (see section 12.6 above).
6. 1/t = t/l (see section 12.7 above).
7. 1/d = d/l (see section 12.8 above).
8. 1/ṭ = ṭ/l (see section 12.9 above).
9. 1/θ = θ/l (see section 12.10 above).
10. 1/ð = ð/l (see section 12.11 above).
11. 1/ḏ = ḏ/l (see section 12.12 above).

12. 1/k = k/1 (see section 12.13 above).
13. 1/g = g/1 (see section 12.14 above).
14. 1/x = x/1 (see section 12.15 above).
15. 1/γ = γ/1 (see section 12.16 above).
16. 1/κ = κ/1 (see section 12.17 above).
17. 1/n = n/1 (see section 12.18 above).
18. 1/r = r/1 (see section 12.19 above).
19. 1/ḷ as in /'xələf/ 'successor' - /'xəlɛf/ 'boy's name'.
20. 1/s as in /'sələ/ 'on' - /'səsə/ 'I hope that'.
21. 1/z as in /'sələ/ 'on' - /'səzə/ 'mourning ceremony'.
22. 1/š as in /'sələ/ 'on' - /'səʃə/ 'walking stick'.
23. 1/č as in /'bɪlə/ 'he accused' - /'bɪčə/ 'he cried'.
24. 1/ğ as in /'sələm/ 'flag' - /'səğəm/ 'Persians'.
25. 1/j as in /'sələ/ 'on' - /'səjə/ 'supper'.
26. 1/h as in /'sɪlə/ 'relation' - /'sɪhə/ 'he sobered up'.
27. 1/s as in /'bələd/ 'country' - /'bəsəd/ 'after'.
28. 1/? as in /'mɪlə/ 'he filled up' - /'mɪ?ə/ 'hundred'.
29. 1/h as in /'sələ/ 'burden' - /'səhə/ 'defect'.
30. 1/i as in /'?ələ/ 'instrument' - /'?aiə/ 'verse of the Koran'.
31. 1/u as in /'?ələ/ 'instrument' - /'?auə/ 'he sheltered'.

(c) In word-final position, /1/ enters into the following distinctive oppositions:

1. 1/f = f/1 (see section 12.4 above).
2. 1/m = m/1 (see section 12.5 above).

3. 1/ṁ = ṁ/1 (see section 12.6 above).
4. 1/ṭ = ṭ/1 (see section 12.7 above).
5. 1/ḍ = ḍ/1 (see section 12.8 above).
6. 1/ṭ̣ = ṭ̣/1 (see section 12.9 above).
7. 1/θ = θ/1 (see section 12.10 above).
8. 1/ð̣ = ð̣/1 (see section 12.11 above).
9. 1/ð̥ = ð̥/1 (see section 12.12 above).
10. 1/ḳ = ḳ/1 (see section 12.13 above).
11. 1/g̣ = g̣/1 (see section 12.14 above).
12. 1/x̣ = x̣/1 (see section 12.15 above).
13. 1/γ̣ = γ̣/1 (see section 12.16 above).
14. 1/ḵ̣ = ḵ̣/1 (see section 12.17 above).
15. 1/ṇ = ṇ/1 (see section 12.18 above).
16. 1/ṛ = ṛ/1 (see section 12.19 above).
17. 1/ɹ̣ as in /xal/ 'mole' - /xaḷ/ 'maternal uncle'.
18. 1/ṣ as in /həl/ 'solution' - /həs/ 'he felt'.
19. 1/ẓ as in /həl/ 'solution' - /həz/ 'notch (n.)'.
20. 1/ʂ̣ as in /xal/ 'mole' - /xaʂ/ 'special'.
21. 1/č̣ as in /fəl/ 'he unwrapped' - /fəč/ 'jawbone'.
22. 1/ǰ̣ as in /həl/ 'solution' - /həǰ/ 'he made the pilgrimage (to Mecca)'.
23. 1/ʃ̣ as in /ʃal/ 'he moved out' - /ʃaʃ/ 'cheesecloth'.
24. 1/ḥ as in /ʃəl/ 'he paralyzed' - /ʃəh/ 'it became scarce'.
25. 1/ʃ̣ as in /ʃəl/ 'he paralyzed' - /ʃəʃ̣/ 'it or he shone'.
26. 1/?̣ as in /ʃal/ 'he moved out' - /ʃa?/ 'he wanted'.
27. 1/ḥ as in /ʃal/ 'he moved out' - /ʃah/ 'Shah'.

28. ɹ/i as in /həl/ 'solution' - /həɹi/ 'alive'.

29. ɹ/u as in /həl/ 'solution' - /həu/ 'wild plant'.

Summary:

The phoneme /ɹ/ is opposable to 29 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally; i.e. /ɹ/ forms a total of 60 different distinctive oppositions within the SIA system of phonological oppositions.

12.21. The Opposability of /ɹ/

The opposability of the phoneme /ɹ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ɹ/ is, like /ɹ/, not opposable to any of the SIA phonemes since it never occurs in this position.

(b) In word-medial position, /ɹ/ enters into the following distinctive oppositions:

1. ɹ/p = p/ɹ (see section 12.2 above).
2. ɹ/b = b/ɹ (see section 12.3 above).
3. ɹ/f = f/ɹ (see section 12.4 above).
4. ɹ/m = m/ɹ (see section 12.6 above).
5. ɹ/t = t/ɹ (see section 12.7 above).
6. ɹ/d = d/ɹ (see section 12.8 above).
7. ɹ/ɖ = ɖ/ɹ (see section 12.9 above).
8. ɹ/θ = θ/ɹ (see section 12.10 above).
9. ɹ/ð = ð/ɹ (see section 12.11 above).

10. ɫ/ð̣ = ð̣/ɫ (see section 12.12 above).
11. ɫ/k = k/ɫ (see section 12.13 above).
12. ɫ/g = g/ɫ (see section 12.14 above).
13. ɫ/x = x/ɫ (see section 12.15 above).
14. ɫ/ɣ = ɣ/ɫ (see section 12.16 above).
15. ɫ/ɰ = ɰ/ɫ (see section 12.17 above).
16. ɫ/n = n/ɫ (see section 12.18 above).
17. ɫ/r = r/ɫ (see section 12.19 above).
18. ɫ/l = l/ɫ (see section 12.20 above).
19. ɫ/s as in /'baɫə/ 'bale' - /'basə/ 'he kissed him'.
20. ɫ/z as in /'baɫə/ 'bale' - /'bazə/ 'cotton fabric'.
21. ɫ/ʂ as in /'xɪɫə/ 'it became empty' - /'xɪʂə/ 'he castrated'.
22. ɫ/č as in /'baɫə/ 'bale' - /'bačə/ 'calf of the leg'.
23. ɫ/ǰ as in /'roɫə/ 'road-roller' - /'roǰə/ 'wave (n.)'.
24. ɫ/ʃ as in /'roɫə/ 'road-roller' - /'roʃə/ 'big crowd'.
25. ɫ/ḥ as in /'roɫə/ 'road-roller' - /'roḥə/ 'visit (n.)'.
26. ɫ/ṣ as in /'baɫə/ 'bale' - /'baṣə/ 'he sold it'.
27. ɫ/ḥ as in /'baɫə/ 'bale' - /'baḥə/ 'he boasted'.
28. ɫ/i as in /'boɫə/ 'ill-mannered woman' - /'boiə/ 'paint (n.)'.
29. ɫ/u as in /'xaɫə/ 'maternal aunt' - /'xauə/ 'protection money'.

(c) In word-final position, /ɫ/ enters into the following distinctive oppositions:

1. ɫ/ɸ = ɸ/ɫ (see section 12.4 above).
2. ɫ/ɱ = ɱ/ɫ (see section 12.6 above).
3. ɫ/t = t/ɫ (see section 12.7 above).





distinctive oppositions within the SIA system of phonological oppositions.

### 12.22. The Opposability of /s/.

The opposability of the phoneme /s/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /s/ enters into the following distinctive oppositions:

1. s/p = p/s (see section 12.2 above).
2. s/b = b/s (see section 12.3 above).
3. s/f = f/s (see section 12.4 above).
4. s/m = m/s (see section 12.5 above).
5. s/ṁ = ṁ/s (see section 12.6 above).
6. s/t = t/s (see section 12.7 above).
7. s/d = d/s (see section 12.8 above).
8. s/ṭ = ṭ/s (see section 12.9 above).
9. s/θ = θ/s (see section 12.10 above).
10. s/ð = ð/s (see section 12.11 above).
11. s/ḡ = ḡ/s (see section 12.12 above).
12. s/k = k/s (see section 12.13 above).
13. s/g = g/s (see section 12.14 above).
14. s/x = x/s (see section 12.15 above).
15. s/γ = γ/s (see section 12.16 above).
16. s/ḵ = ḵ/s (see section 12.17 above).
17. s/n = n/s (see section 12.18 above).
18. s/r = r/s (see section 12.19 above).

19. s/z as in /səd/ 'it prevailed or dominated' - /zəd/ 'it increased'.
20. s/ʒ as in /sef/ 'sword' - /ʒef/ 'summer'.
21. s/ʒ as in /səd/ 'dam' - /ʒəd/ 'he worked hard'.
22. s/ʒ as in /sar/ 'he walked' - /ʒar/ 'neighbour'.
23. s/ʒ as in /səd/ 'dam' - /ʒəd/ 'he tied'.
24. s/h as in /səd/ 'dam' - /həd/ 'limit (n.)'.
25. s/s as in /səd/ 'dam' - /səd/ 'he counted'.
26. s/? as in /'səʒʒəl/ 'he recorded' - /'ʔəʒʒəl/ 'he postponed'.
27. s/h as in /səd/ 'dam' - /həd/ 'he let go'.
28. s/i as in /səd/ 'dam' - /iəd/ 'hand (n.)'.
29. s/u as in /səd/ 'dam' - /uəd/ 'he liked'.

(b) In word-medial position, /s/ enters into the following distinctive oppositions:

1. s/b = b/s (see section 12.3 above).
2. s/f = f/s (see section 12.4 above).
3. s/m = m/s (see section 12.5 above).
4. s/ṁ = ṁ/s (see section 12.6 above).
5. s/t = t/s (see section 12.7 above).
6. s/d = d/s (see section 12.8 above).
7. s/ṭ = ṭ/s (see section 12.9 above).
8. s/θ = θ/s (see section 12.10 above).
9. s/ð = ð/s (see section 12.11 above).
10. s/ð̣ = ð̣/s (see section 12.12 above).
11. s/k = k/s (see section 12.13 above).
12. s/g = g/s (see section 12.14 above).

13. s/x = x/s (see section 12.15 above).
14. s/γ = γ/s (see section 12.16 above).
15. s/κ = κ/s (see section 12.17 above).
16. s/n = n/s (see section 12.18 above).
17. s/r = r/s (see section 12.19 above).
18. s/l = l/s (see section 12.20 above).
19. s/ł = ł/s (see section 12.21 above).
20. s/z as in /'hɪsɪn/ 'beauty' - /'hɪzɪn/ 'mourning (n.)'.
21. s/š as in /'hɪsəd/ 'he envied' - /'hɪʃəd/ 'he reaped'.
22. s/č as in /'fɪsəx/ 'he broke (his engagement)' - /'fɪčəx/ 'he hit (on the head)'.
23. s/ǵ as in /'ʔʊsrə/ 'family' - /'ʔʊǵrə/ 'fare or wage'.
24. s/ʃ as in /'ʃəsə/ 'I hope that' - /'ʃəʃə/ 'supper'.
25. s/h as in /ʔə'sɪr/ 'captive' - /ʔə'hɪr/ 'I become confused or undecided'.
26. s/ʕ as in /ʔə'sɪr/ 'captive' - /ʔə'ʕɪr/ 'I lend'.
27. s/? as in /'nasɪ/ '(hê) having forgotten' - /'naʔɪ/ 'very far'.
28. s/h as in /'nɪsə/ 'he forgot' - /'nɪhə/ 'he finished (sth.)'.
29. s/i as in /'ʃəsə/ 'I hope that' - /'ʃəiə/ 'sickness'.
30. s/u as in /'ʔasə/ 'drinking bowl' - /'ʔauə/ 'frying pan'.

(c) In word-final position, /s/ enters into the following distinctive oppositions:

1. s/f = f/s (see section 12.4 above).
2. s/m = m/s (see section 12.5 above).
3. ʃ/ṃ = ṃ/ʃ (see section 12.6 above).
4. s/t = t/s (see section 12.7 above).

5. s/d = d/s (see section 12.8 above).
6. s/ṭ = ṭ/s (see section 12.9 above).
7. s/θ = θ/s (see section 12.10 above).
8. s/ð̣ = ð̣/s (see section 12.12 above).
9. s/k = k/s (see section 12.13 above).
10. s/g = g/s (see section 12.14 above).
11. s/x = x/s (see section 12.15 above).
12. s/γ = γ/s (see section 12.16 above).
13. s/ḳ = ḳ/s (see section 12.17 above).
14. s/n = n/s (see section 12.18 above).
15. s/r = r/s (see section 12.19 above).
16. s/l = l/s (see section 12.20 above).
17. s/ḷ = ḷ/s (see section 12.21 above).
18. s/z as in /həs/ 'he felt' - /həz/ 'notch (n.)'.
19. s/ṣ as in /xəs/ 'lettuce' - /xəṣ/ 'he specified'.
20. s/č as in /ǵas/ 'he touched' - /ǵač/ 'he came to you (f. sing.)'.
21. s/ǵ as in /həs/ 'he felt' - /həǵ/ 'he made the pilgrimage (to Mecca)'.
22. s/f as in /xəs/ 'lettuce' - /xəf/ 'it or he entered'.
23. s/ḥ as in /ras/ 'head (n.)' - /raħ/ 'he went or left'.
24. s/ṣ as in /ǵas/ 'he touched' - /ǵa<sup>ṣ</sup>/ 'he felt hungry'.
25. s/? as in /sus/ 'licorice' - /su<sup>?</sup>/ 'evil (n.)'.
26. s/ḥ as in /ǵas/ 'he touched' - /ǵah/ 'dignity'.
27. s/i as in /həs/ 'he felt' - /həi/ 'alive'.
28. s/u as in /həs/ 'he felt' - /həu/ 'wild plant'.

Summary

The phoneme /s/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 26 consonant phonemes and 2 vowel phonemes word-finally; i.e. /s/ forms a total of 87 different distinctive oppositions within the SIA system of phonological oppositions.

12.23. The Opposability of /z/.

The opposability of the phoneme /z/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /z/ enters into the following distinctive oppositions:

1. z/p = p/z (see section 12.2 above).
2. z/b = b/z (see section 12.3 above).
3. z/f = f/z (see section 12.4 above).
4. z/m = m/z (see section 12.5 above).
5. z/ṃ = ṃ/z (see section 12.6 above).
6. z/t = t/z (see section 12.7 above).
7. z/d̄ = d̄/z (see section 12.8 above).
8. z/ṭ̄ = ṭ̄/z (see section 12.9 above).
9. z/θ = θ/z (see section 12.10 above).
10. z/ð̄ = ð̄/z (see section 12.11 above).
11. z/ð̇ = ð̇/z (see section 12.12 above).
12. z/k = k/z (see section 12.13 above).

13. z/g = g/z (see section 12.14 above).
14. z/x = x/z (see section 12.15 above).
15. z/ɣ = ɣ/z (see section 12.16 above).
16. z/ɣ̣ = ɣ̣/z (see section 12.17 above).
17. z/n = n/z (see section 12.18 above).
18. z/r = r/z (see section 12.19 above).
19. z/s = s/z (see section 12.22 above).
20. z/ʂ as in /zar/ 'he visited' - /ʂar/ 'he became'.
21. z/č as in /zal/ 'it disappeared' - /čal/ 'he measured out'.
22. z/ǧ as in /zar/ 'he visited' - /ǧar/ 'neighbour'.
23. z/ʃ as in /zal/ 'it disappeared' - /ʃal/ 'he moved out'.
24. z/h̄ as in /zar/ 'he visited' - /h̄ar/ 'hot'.
25. z/ʎ as in /zar/ 'he visited' - /ʎar/ 'disgrace (n.)'.
26. z/? as in /'zanɪ/ 'adulterer' - /'ʔanɪ/ 'I'.
27. z/h as in /'zanɪ/ 'adulterer' - /'hanɪ/ 'boy's name'.
28. z/i as in /'zələg/ 'slippery' - /'iələg/ 'waistcoat'.
29. z/u as in /zen/ 'good or well' - /uen/ 'where?'.

(b) In word-medial position, /z/ enters into the following distinctive oppositions:

1. z/b = b/z (see section 12.3 above).
2. z/f = f/z (see section 12.4 above).
3. z/m = m/z (see section 12.5 above).
4. z/ṃ = ṃ/z (see section 12.6 above).
5. z/t = t/z (see section 12.7 above).
6. z/d = d/z (see section 12.8 above).
7. z/ṭ = ṭ/z (see section 12.9 above).

8. z/θ = θ/z (see section 12.10 above).
9. z/ð = ð/z (see section 12.11 above).
10. z/ð̇ = ð̇/z (see section 12.12 above).
11. z/k = k/z (see section 12.13 above).
12. z/g = g/z (see section 12.14 above).
13. z/x = x/z (see section 12.15 above).
14. z/γ = γ/z (see section 12.16 above).
15. z/κ̇ = κ̇/z (see section 12.17 above).
16. z/n = n/z (see section 12.18 above).
17. z/r = r/z (see section 12.19 above).
18. z/l = l/z (see section 12.20 above).
19. z/l̇ = l̇/z (see section 12.21 above).
20. z/s = s/z (see section 12.22 above).
21. z/ş as in /'səzə/ 'mourning ceremony' - /'səşə/ 'walking stick'.
22. z/č as in /'ʔə'zil/ 'I remove' - /'ʔə'čil/ 'I measure out'.
23. z/ǧ as in /'səzmɪ/ 'boy's name' - /'səǧmɪ/ 'Persian'.
24. z/ʃ as in /'səzə/ 'mourning ceremony' - /'səʃə/ 'supper'.
25. z/ħ as in /'mɪznə/ 'shower' - /'mɪħnə/ 'ordeal'.
26. z/ʕ as in /'ǧɪzər/ 'carrots' - /'ǧɪʕər/ 'it or he brayed'.
27. z/ʔ as in /'ʔəzmən/ 'it became chronic' - /'ʔəʔmən/ 'safer'.
28. z/h as in /'mɪznə/ 'shower' - /'mɪhnə/ 'profession'.
29. z/i as in /'ʔəzmən/ 'it became chronic' - /'ʔəimən/ 'right (adj.)'.
30. z/u as in /kə'zan/ 'cauldron' - /kə'uan/ 'phonograph record(s)'.



(c) In word-final position, /z/ enters into the following distinctive oppositions:

1. z/ɸ = ɸ/z (see section 12.4 above).
2. z/m = m/z (see section 12.5 above).
3. z/ṁ = ṁ/z (see section 12.6 above).
4. z/t = t/z (see section 12.7 above).
5. z/d = d/z (see section 12.8 above).
6. z/ṭ = ṭ/z (see section 12.9 above).
7. z/θ = θ/z (see section 12.10 above).
8. z/ð = ð/z (see section 12.11 above).
9. z/ḏ = ḏ/z (see section 12.12 above).
10. z/k = k/z (see section 12.13 above).
11. z/g = g/z (see section 12.14 above).
12. z/x = x/z (see section 12.15 above).
13. z/γ = γ/z (see section 12.16 above).
14. z/κ = κ/z (see section 12.17 above).
15. z/n = n/z (see section 12.18 above).
16. z/ɣ = ɣ/z (see section 12.19 above).
17. z/l = l/z (see section 12.20 above).
18. z/s = s/z (see section 12.22 above).
19. z/ş as in /ɣaz/ 'gas' - /ɣaş/ 'it or he dived'.
20. z/č as in /fəz/ 'he woke up' - /fəč/ 'jawbone'.
21. z/ǧ as in /ħəz/ 'notch (n.)' - /ħəǧ/ 'he made the pilgrimage (to Mecca)'.
22. z/ʃ as in /fəz/ 'he woke up' - /fəʃ/ 'it deflated'.
23. z/h as in /faz/ 'he won' - /faħ/ 'it (i.e. odour) diffused'.

24. z/ʃ as in /ǰaz/ 'he quit' - /ǰaʃ/ 'he became hungry'.
25. z/? as in /faz/ 'he won' - /faʔ/ 'the name of the letter "f"'.  
"f"'.  
26. z/i as in /fəz/. 'he woke up' - /fəi/ 'shade'.
27. z/u as in /faz/. 'he won' - /fau/ 'Faw (a town)'.

### Summary:

The phoneme /z/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 25 consonant phonemes and 2 vowel phonemes word-finally; i.e. /z/ forms a total of 86 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.24. The Opposability of /ʃ/.

The opposability of the phoneme /ʃ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ʃ/ enters into the following distinctive oppositions:

1. ʃ/p = p/ʃ (see section 12.2 above).
2. ʃ/b = b/ʃ (see section 12.3 above).
3. ʃ/f = f/ʃ (see section 12.4 above).
4. ʃ/m = m/ʃ (see section 12.5 above).
5. ʃ/ṁ = ṁ/ʃ (see section 12.6 above).
6. ʃ/t = t/ʃ (see section 12.7. above).
7. ʃ/d = d/ʃ (see section 12.8 above).

8.  $\text{ʃ}/\text{t} = \text{t}/\text{ʃ}$  (see section 12.9 above).
9.  $\text{ʃ}/\theta = \theta/\text{ʃ}$  (see section 12.10 above).
10.  $\text{ʃ}/\delta = \delta/\text{ʃ}$  (see section 12.11 above).
11.  $\text{ʃ}/\delta = \delta/\text{ʃ}$  (see section 12.12 above).
12.  $\text{ʃ}/\text{k} = \text{k}/\text{ʃ}$  (see section 12.13 above).
13.  $\text{ʃ}/\text{g} = \text{g}/\text{ʃ}$  (see section 12.14 above).
14.  $\text{ʃ}/\text{x} = \text{x}/\text{ʃ}$  (see section 12.15 above).
15.  $\text{ʃ}/\gamma = \gamma/\text{ʃ}$  (see section 12.16 above).
16.  $\text{ʃ}/\text{k} = \text{k}/\text{ʃ}$  (see section 12.17 above).
17.  $\text{ʃ}/\text{n} = \text{n}/\text{ʃ}$  (see section 12.18 above).
18.  $\text{ʃ}/\text{r} = \text{r}/\text{ʃ}$  (see section 12.19 above).
19.  $\text{ʃ}/\text{s} = \text{s}/\text{ʃ}$  (see section 12.22 above).
20.  $\text{ʃ}/\text{z} = \text{z}/\text{ʃ}$  (see section 12.23 above).
21.  $\text{ʃ}/\check{\text{c}}$  as in  $/\text{ʃ}\check{\text{e}}\text{d}/$  'he threw back' -  $/\check{\text{c}}\check{\text{e}}\text{d}/$  'he worked hard'.
22.  $\text{ʃ}/\check{\text{g}}$  as in  $/\text{ʃ}\check{\text{a}}\text{r}/$  'he became' -  $/\check{\text{g}}\check{\text{a}}\text{r}/$  'neighbour'.
23.  $\text{ʃ}/\text{ʃ}$  as in  $/\text{ʃ}\check{\text{e}}\text{d}/$  'he threw back' -  $/\text{ʃ}\check{\text{e}}\text{d}/$  'he tied'.
24.  $\text{ʃ}/\text{h}$  as in  $/\text{ʃ}\check{\text{e}}\text{d}/$  'he threw back' -  $/\text{h}\check{\text{e}}\text{d}/$  'limit (n.)'.
25.  $\text{ʃ}/\text{c}$  as in  $/\text{ʃ}\check{\text{e}}\text{d}/$  'he threw back' -  $/\text{c}\check{\text{e}}\text{d}/$  'he counted'.
26.  $\text{ʃ}/\text{ʔ}$  as in  $/\text{ʃ}\text{a}1\text{e}/$  'room or hall' -  $/\text{ʔ}\text{a}1\text{e}/$  'instrument'.
27.  $\text{ʃ}/\text{h}$  as in  $/\text{ʃ}\check{\text{e}}\text{d}/$  'he threw back' -  $/\text{h}\check{\text{e}}\text{d}/$  'he let go'.
28.  $\text{ʃ}/\text{i}$  as in  $/\text{ʃ}\check{\text{e}}\text{d}/$  'he threw back' -  $/\text{i}\check{\text{e}}\text{d}/$  'hand (n.)'.
29.  $\text{ʃ}/\text{u}$  as in  $/\text{ʃ}\check{\text{e}}\text{d}/$  'he threw back' -  $/\text{u}\check{\text{e}}\text{d}/$  'he liked'.

(b) In word-medial position,  $/\text{ʃ}/$  enters into the following distinctive oppositions:

1.  $\text{ʃ}/\text{b} = \text{b}/\text{ʃ}$  (see section 12.3 above).
2.  $\text{ʃ}/\text{f} = \text{f}/\text{ʃ}$  (see section 12.4 above).

3.  $\text{ɣ}/\text{m} = \text{m}/\text{ɣ}$  (see section 12.5 above).
4.  $\text{ɣ}/\text{m̄} = \text{m̄}/\text{ɣ}$  (see section 12.6 above).
5.  $\text{ɣ}/\text{t} = \text{t}/\text{ɣ}$  (see section 12.7 above).
6.  $\text{ɣ}/\text{d} = \text{d}/\text{ɣ}$  (see section 12.8 above).
7.  $\text{ɣ}/\text{t̄} = \text{t̄}/\text{ɣ}$  (see section 12.9 above).
8.  $\text{ɣ}/\theta = \theta/\text{ɣ}$  (see section 12.10 above).
9.  $\text{ɣ}/\delta = \delta/\text{ɣ}$  (see section 12.11 above).
10.  $\text{ɣ}/\deltā = \deltā/\text{ɣ}$  (see section 12.12 above).
11.  $\text{ɣ}/\text{k} = \text{k}/\text{ɣ}$  (see section 12.13 above).
12.  $\text{ɣ}/\text{g} = \text{g}/\text{ɣ}$  (see section 12.14 above).
13.  $\text{ɣ}/\text{x} = \text{x}/\text{ɣ}$  (see section 12.15 above).
14.  $\text{ɣ}/\gamma = \gamma/\text{ɣ}$  (see section 12.16 above).
15.  $\text{ɣ}/\text{k̄} = \text{k̄}/\text{ɣ}$  (see section 12.17 above).
16.  $\text{ɣ}/\text{n} = \text{n}/\text{ɣ}$  (see section 12.18 above).
17.  $\text{ɣ}/\text{r} = \text{r}/\text{ɣ}$  (see section 12.19 above).
18.  $\text{ɣ}/\text{l} = \text{l}/\text{ɣ}$  (see section 12.20 above).
19.  $\text{ɣ}/\text{l̄} = \text{l̄}/\text{ɣ}$  (see section 12.21 above).
20.  $\text{ɣ}/\text{s} = \text{s}/\text{ɣ}$  (see section 12.22 above).
21.  $\text{ɣ}/\text{z} = \text{z}/\text{ɣ}$  (see section 12.23 above).
22.  $\text{ɣ}/\text{č}$  as in  $/\text{'nəɣɪr}/$  'victory' -  $/\text{'nəčɪr}/$  'defiant'.
23.  $\text{ɣ}/\text{ǧ}$  as in  $/\text{'nəɣɪr}/$  'victory' -  $/\text{'nəǧɪr}/$  'chopping (n.)'.
24.  $\text{ɣ}/\text{j}$  as in  $/\text{'nəɣɪr}/$  'victory' -  $/\text{'nəjɪr}/$  'publication'.
25.  $\text{ɣ}/\text{h}$  as in  $/\text{ʔə'ɣɪr}/$  'I become' -  $/\text{ʔə'hɪr}/$  'I become confused or undecided'.
26.  $\text{ɣ}/\text{ʕ}$  as in  $/\text{ʔə'ɣɪr}/$  'I become' -  $/\text{ʔə'ʕɪr}/$  'I lend'.
27.  $\text{ɣ}/\text{ʔ}$  as in  $/\text{'nəɣɪr}/$  'low' -  $/\text{'nəʔɪr}/$  'very far'.

28.  $\text{ɣ}/h$  as in /'naɣɪ/ 'low' - /'naɦɪ/ 'boy's name'.  
 29.  $\text{ɣ}/i$  as in /'ɣaɣə/ 'his sauce' - /'ɣaiə/ 'smock'.  
 30.  $\text{ɣ}/u$  as in /'ɦaɣɪl/ 'profit (n.)' - /'ɦaurɪ/ 'try!'.

(c) In word-final position, /ɣ/ enters into the following distinctive oppositions:

1.  $\text{ɣ}/f = f/\text{ɣ}$  (see section 12.4 above).
2.  $\text{ɣ}/m = m/\text{ɣ}$  (see section 12.5 above).
3.  $\text{ɣ}/\text{m̥} = \text{m̥}/\text{ɣ}$  (see section 12.6 above).
4.  $\text{ɣ}/t = t/\text{ɣ}$  (see section 12.7 above).
5.  $\text{ɣ}/d = d/\text{ɣ}$  (see section 12.8 above).
6.  $\text{ɣ}/\text{t̥} = \text{t̥}/\text{ɣ}$  (see section 12.9 above).
7.  $\text{ɣ}/\theta = \theta/\text{ɣ}$  (see section 12.10 above).
8.  $\text{ɣ}/\delta = \delta/\text{ɣ}$  (see section 12.11 above).
9.  $\text{ɣ}/\deltḁ = \deltḁ/\text{ɣ}$  (see section 12.12 above).
10.  $\text{ɣ}/k = k/\text{ɣ}$  (see section 12.13 above).
11.  $\text{ɣ}/g = g/\text{ɣ}$  (see section 12.14 above).
12.  $\text{ɣ}/x = x/\text{ɣ}$  (see section 12.15 above).
13.  $\text{ɣ}/\gamma = \gamma/\text{ɣ}$  (see section 12.16 above).
14.  $\text{ɣ}/\text{ḳ} = \text{ḳ}/\text{ɣ}$  (see section 12.17 above).
15.  $\text{ɣ}/n = n/\text{ɣ}$  (see section 12.18 above).
16.  $\text{ɣ}/r = r/\text{ɣ}$  (see section 12.19 above).
17.  $\text{ɣ}/l = l/\text{ɣ}$  (see section 12.20 above).
18.  $\text{ɣ}/\text{ḷ} = \text{ḷ}/\text{ɣ}$  (see section 12.21 above).
19.  $\text{ɣ}/s = s/\text{ɣ}$  (see section 12.22 above).
20.  $\text{ɣ}/z = z/\text{ɣ}$  (see section 12.23 above).
21.  $\text{ɣ}/\check{c}$  as in /baɣ/ 'bus' - /bač/ '(he) having packed'.

22. ʃ/ǧ as in /ʃaʃ/ 'sauce' - /ʃaǧ/ 'teakwood'.
23. ʃ/ʃ as in /xəʃ/ 'he specified' - /xəʃ/ 'it or he entered'.
24. ʃ/ħ as in /baʃ/ 'bus' - /baħ/ 'he revealed (a secret)'.
25. ʃ/ʕ as in /baʃ/ 'bus' - /baʕ/ 'he sold'.
26. ʃ/? as in /baʃ/ 'bus' - /baʔ/ 'the name of the letter "b"'.  
 27. ʃ/i as in /ʃaʃ/ 'sauce' - /ʃai/ 'piece (in a game of dominoes or backgammon)'.
28. ʃ/u as in /xaʃ/ 'special' - /xau/ 'protection money'.

### Summary

The phoneme /ʃ/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 26 consonant phonemes and 2 vowel phonemes word-finally; i.e. /ʃ/ forms a total of 87 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.25. The Opposability of /č/.

The opposability of the phoneme /č/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /č/ enters into the following distinctive oppositions:

1. č/p = p/č (see section 12.2 above).
2. č/b = b/č (see section 12.3 above).
3. č/f = f/č (see section 12.4 above).
4. č/m = m/č (see section 12.5 above).



(b) In word-medial position, /č/ enters into the following distinctive oppositions:

1. č/b = b/č (see section 12.3 above).
2. č/ɸ = ɸ/č (see section 12.4 above).
3. č/m = m/č (see section 12.5 above).
4. č/t = t/č (see section 12.7 above).
5. č/a = a/č (see section 12.8 above).
6. č/ɸ̣ = ɸ̣/č (see section 12.9 above).
7. č/θ = θ/č (see section 12.10 above).
8. č/ð = ð/č (see section 12.11 above).
9. č/ð̣ = ð̣/č (see section 12.12 above).
10. č/k = k/č (see section 12.13 above).
11. č/g = g/č (see section 12.14 above).
12. č/x = x/č (see section 12.15 above).
13. č/ɣ = ɣ/č (see section 12.16 above).
14. č/ɣ̣ = ɣ̣/č (see section 12.17 above).
15. č/n = n/č (see section 12.18 above).
16. č/r = r/č (see section 12.19 above).
17. č/l = l/č (see section 12.20 above).
18. č/ḷ = ḷ/č (see section 12.21 above).
19. č/s = s/č (see section 12.22 above).
20. č/z = z/č (see section 12.23 above).
21. č/ṣ = ṣ/č (see section 12.24 above).
22. č/ǧ as in /'nəčɪɾ/ 'defiant' - /'nəǧɪɾ/ 'chopping (n.)'.
23. č/ʃ as in /'həčɪ/ 'talking (n.)' - /'həʃɪ/ 'filling up with unnecessary stuff'.



24. č/h as in /'nəčɪɾ/ 'defiant' - /'nəhɪɾ/ 'slaughtering (n.)'.
25. č/ʳ as in /ɾa'čɛtə/ 'medical prescription' - /ɾa'ʳɛtə/  
'I treated him well'.
26. č/? as in /'bɪčɪɾ/. 'first child' - /'bɪ?ɪɾ/ 'well (n.)'.
27. č/h as in /'ntɪčə/ 'he leant back' - /'ntɪhə/ 'it was  
finished'.
28. č/i as in /'pačə/ 'calf of the leg' - /'paiə/ 'stair'.
29. č/u as in /ɾa'čɛtə/ 'medical prescription' - /ɾa'uetə/  
'I showed him'.

(c) In word-final position, /č/ enters into the following distinctive oppositions:

1. č/ɛ = ɛ/č (see section 12.4 above).
2. č/m = m/č (see section 12.5 above).
3. č/ṃ = ṃ/č (see section 12.6 above).
4. č/t = t/č (see section 12.7 above).
5. č/d = d/č (see section 12.8 above).
6. č/ṭ = ṭ/č (see section 12.9 above).
7. č/θ = θ/č (see section 12.10 above).
8. č/ð = ð/č (see section 12.11 above).
9. č/ð̣ = ð̣/č (see section 12.12 above).
10. č/k = k/č (see section 12.13 above).
11. č/g = g/č (see section 12.14 above).
12. č/x = x/č (see section 12.15 above).
13. č/ɣ = ɣ/č (see section 12.16 above).
14. č/ḵ = ḵ/č (see section 12.17 above).

15. č/n = n/č (see section 12.18 above).
16. č/r = r/č (see section 12.19 above).
17. č/l = l/č (see section 12.20 above).
18. č/s = s/č (see section 12.22 above).
19. č/z = z/č (see section 12.23 above).
20. č/š = š/č (see section 12.24 above).
21. č/ǵ as in /hač/ 'take!' (f. sing.)' - /haǵ/ 'he became excited'.
22. č/ʃ as in /fəč/ 'jawbone' - /fəʃ/ 'he deflated'.
23. č/h as in /bač/ '(he) having packed' - /baħ/ 'he revealed (a secret)'.
24. č/ʕ as in /ǵač/ 'he came to you (f. sing.)' - /ǵaʕ/ 'he felt hungry'.
25. č/? as in /hač/ 'take! (f. sing.)' - /ha?/ 'the name of the letter "h"'. .
26. č/h as in /ǵač/ 'he came to you (f. sing.)' - /ǵah/ 'dignity'.
27. č/i as in /fəč/ 'jawbone' - /fəi/ 'shade'.
28. č/u as in /ʕɪləč/ 'he chewed' - /ʕɪləu/ 'they became higher (in rank)'.

Summary:

The phoneme /č/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 27 consonant phonemes and 2 vowel phonemes word-medially, and 26 consonant phonemes and 2 vowel phonemes word-finally; i.e. /č/ forms a total of 86 different distinctive oppositions within the SIA system of phonological oppositions.

12.26. The Opposability of /ǧ/.

The opposability of the phoneme /ǧ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ǧ/ enters into the following distinctive oppositions:

1. ǧ/p = p/ǧ (see section 12.2 above).
2. ǧ/b = b/ǧ (see section 12.3 above).
3. ǧ/ɸ = ɸ/ǧ (see section 12.4 above).
4. ǧ/m = m/ǧ (see section 12.5 above).
5. ǧ/ṃ = ṃ/ǧ (see section 12.6 above).
6. ǧ/t = t/ǧ (see section 12.7 above).
7. ǧ/d = d/ǧ (see section 12.8 above).
8. ǧ/ṭ = ṭ/ǧ (see section 12.9 above).
9. ǧ/θ = θ/ǧ (see section 12.10 above).
10. ǧ/ð = ð/ǧ (see section 12.11 above).
11. ǧ/ð̣ = ð̣/ǧ (see section 12.12 above).
12. ǧ/k = k/ǧ (see section 12.13 above).
13. ǧ/g = g/ǧ (see section 12.14 above).
14. ǧ/x = x/ǧ (see section 12.15 above).
15. ǧ/ɣ = ɣ/ǧ (see section 12.16 above).
16. ǧ/ḵ = ḵ/ǧ (see section 12.17 above).
17. ǧ/n = n/ǧ (see section 12.18 above).
18. ǧ/r = r/ǧ (see section 12.19 above).
19. ǧ/s = s/ǧ (see section 12.22 above).
20. ǧ/z = z/ǧ (see section 12.23 above).
21. ǧ/š = š/ǧ (see section 12.24 above).

22. ǰ/č = č/ǰ (see section 12.25 above).
23. ǰ/ʃ as in /ǰʊʃ/ 'lime' - /ʃʊʃ/ 'fish hook'.
24. ǰ/ħ as in /ǰaɾ/ 'neighbour' - /ħaɾ/ 'hot'.
25. ǰ/ʕ as in /ǰaɾ/ 'neighbour' - /ʕaɾ/ 'disgrace (n.)'.
26. ǰ/? as in /ǰəu/ 'weather' - /?əu/ 'or'.
27. ǰ/h as in /ǰəd/ 'he worked very hard' - /həd/ 'he let go'.
28. ǰ/i as in /ǰəd/ 'he worked very hard' - /iəd/ 'hand (n.)'.
29. ǰ/u as in /ǰəd/ 'he worked very hard' - /uəd/ 'he liked'.

(b) In word-medial position, /ǰ/ enters into the following distinctive oppositions:

1. ǰ/b = b/ǰ (see section 12.3 above).
2. ǰ/ɛ = ɛ/ǰ (see section 12.4 above).
3. ǰ/m = m/ǰ (see section 12.5 above).
4. ǰ/ṁ = ṁ/ǰ (see section 12.6 above).
5. ǰ/t = t/ǰ (see section 12.7 above).
6. ǰ/d = d/ǰ (see section 12.8 above).
7. ǰ/ɗ = ɗ/ǰ (see section 12.9 above).
8. ǰ/θ = θ/ǰ (see section 12.10 above).
9. ǰ/ð = ð/ǰ (see section 12.11 above).
10. ǰ/ð̣ = ð̣/ǰ (see section 12.12 above).
11. ǰ/k = k/ǰ (see section 12.13 above).
12. ǰ/g = ɡ/ǰ (see section 12.14 above).
13. ǰ/x = x/ǰ (see section 12.15 above).
14. ǰ/ɣ = ɣ/ǰ (see section 12.16 above).
15. ǰ/ɣ̣ = ɣ̣/ǰ (see section 12.17 above).
16. ǰ/n = n/ǰ (see section 12.18 above).

17. ǰ/ɾ = ɾ/ǰ (see section 12.19 above).
18. ǰ/ɭ = ɭ/ǰ (see section 12.20 above).
19. ǰ/ɮ = ɮ/ǰ (see section 12.21 above).
20. ǰ/s = s/ǰ (see section 12.22 above).
21. ǰ/z = z/ǰ (see section 12.23 above).
22. ǰ/ʂ = ʂ/ǰ (see section 12.24 above).
23. ǰ/č = č/ǰ (see section 12.25 above).
24. ǰ/ɹ as in /'ʔəǰməɭ/ 'more beautiful' - /'ʔəɟməɭ/ 'more detailed'.
25. ǰ/h as in /ʔə'ǰid/ 'I do well' - /ʔə'hid/ 'I deviate from'.
26. ǰ/ʃ as in /'ɟɪǰəɾ/ 'pumpkin(s)' - /'ɟɪʃəɾ/ 'he felt'.
27. ǰ/ʔ as in /'naǰɪ/ 'boy's name' - /'naʔɪ/ 'very far'.
28. ǰ/h as in /'ɟɪǰəɾ/ 'pumpkin(s)' - /'ɟɪhəɾ/ 'he made well-known'.
29. ǰ/i as in /'ʂaǰə/ 'his teakwood' - /'ʂaiə/ 'smock'.
30. ǰ/u as in /'naǰɪ/ 'boy's name' - /'nauɪ/ 'determined (to do sth.)'.

(c) In word-final position, /ǰ/ enters into the following distinctive oppositions:

1. ǰ/ɸ = ɸ/ǰ (see section 12.4 above).
2. ǰ/m = m/ǰ (see section 12.5 above).
3. ǰ/ṃ = ṃ/ǰ (see section 12.6 above).
4. ǰ/t = t/ǰ (see section 12.7 above).
5. ǰ/d = d/ǰ (see section 12.8 above).
6. ǰ/ṭ = ṭ/ǰ (see section 12.9 above).
7. ǰ/θ = θ/ǰ (see section 12.10 above).
8. ǰ/ð = ð/ǰ (see section 12.11 above).

9. ǰ/ǰ̣ = ǰ̣/ǰ (see section 12.12 above).
10. ǰ/k = k/ǰ (see section 12.13 above).
11. ǰ/g = g/ǰ (see section 12.14 above).
12. ǰ/x = x/ǰ (see section 12.15 above).
13. ǰ/ɣ = ɣ/ǰ (see section 12.16 above).
14. ǰ/ḵ = ḵ/ǰ (see section 12.17 above).
15. ǰ/n = n/ǰ (see section 12.18 above).
16. ǰ/r = r/ǰ (see section 12.19 above).
17. ǰ/l = l/ǰ (see section 12.20 above).
18. ǰ/ɭ = ɭ/ǰ (see section 12.21 above).
19. ǰ/s = s/ǰ (see section 12.22 above).
20. ǰ/z = z/ǰ (see section 12.23 above).
21. ǰ/ʂ = ʂ/ǰ (see section 12.24 above).
22. ǰ/č = č/ǰ (see section 12.25 above).
23. ǰ/ʃ as in /ʃaǰ/ 'ivory' - /ʃaʃ/ 'he lived'.
24. ǰ/ħ as in /ʂaǰ/ 'teakwood' - /ʂaħ/ 'he shouted'.
25. ǰ/ʕ as in /ǰaǰ/ 'he became bored' - /ǰaʕ/ 'it or he was lost'.
26. ǰ/? as in /ħaǰ/ 'pilgrim' - /ħaʔ/ 'the name of the letter "h"'. .
27. ǰ/h as in /ǰaǰ/ 'chicken(s)' - /ǰah/ 'dignity'.
28. ǰ/i as in /ħəǰ/ 'he made the pilgrimage (to Mecca)' - /ħəi/ 'alive'.
29. ǰ/u as in /ħəǰ/ 'he made the pilgrimage (to Mecca)' - /ħəu/ 'wild plant'.

Summary:

The phoneme /ǰ/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally,; i.e. /ǰ/ forms a total of 88 different distinctive oppositions within the SIA system of phonological oppositions.

12.27. The Opposability of /ǰ/.

The opposability of the phoneme /ǰ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ǰ/ enters into the following distinctive oppositions:

1. ǰ/p = p/ǰ (see section 12.2 above).
2. ǰ/b = b/ǰ (see section 12.3 above).
3. ǰ/ɛ = ɛ/ǰ (see section 12.4 above).
4. ǰ/m = m/ǰ (see section 12.5 above).
5. ǰ/ṁ = ṁ/ǰ (see section 12.6 above).
6. ǰ/t = t/ǰ (see section 12.7 above).
7. ǰ/d = d/ǰ (see section 12.8 above).
8. ǰ/ṭ = ṭ/ǰ (see section 12.9 above).
9. ǰ/θ = θ/ǰ (see section 12.10 above).
10. ǰ/ð = ð/ǰ (see section 12.11 above).
11. ǰ/ḏ = ḏ/ǰ (see section 12.12 above).
12. ǰ/k = k/ǰ (see section 12.13 above).
13. ǰ/g = g/ǰ (see section 12.14 above).

14.  $\int/x = x/\int$  (see section 12.15 above).
15.  $\int/\gamma = \gamma/\int$  (see section 12.16 above).
16.  $\int/k = k/\int$  (see section 12.17 above).
17.  $\int/n = n/\int$  (see section 12.18 above).
18.  $\int/r = r/\int$  (see section 12.19 above).
19.  $\int/s = s/\int$  (see section 12.22 above).
20.  $\int/z = z/\int$  (see section 12.23 above).
21.  $\int/\zeta = \zeta/\int$  (see section 12.24 above).
22.  $\int/\check{c} = \check{c}/\int$  (see section 12.25 above).
23.  $\int/\check{g} = \check{g}/\int$  (see section 12.26 above).
24.  $\int/h$  as in  $/\int\text{əd}/$  'he tied' -  $/h\text{əd}/$  'limit (n.)'.
25.  $\int/ʳ$  as in  $/\int\text{əd}/$  'he tied' -  $/ʳ\text{əd}/$  'he counted'.
26.  $\int/?$  as in  $/\int\text{əx}/$  'he urinated' -  $/?\text{əx}/$  'brother'.
27.  $\int/h$  as in  $/\int\text{əd}/$  'he tied' -  $/h\text{əd}/$  'he let go'.
28.  $\int/i$  as in  $/\int\text{əd}/$  'he tied' -  $/i\text{əd}/$  'hand (n.)'.
29.  $\int/u$  as in  $/\int\text{əd}/$  'he tied' -  $/u\text{əd}/$  'he liked'.

(b) In word-medial position,  $/\int/$  enters into the following distinctive oppositions:

1.  $\int/b = b/\int$  (see section 12.3 above).
2.  $\int/\text{f} = \text{f}/\int$  (see section 12.4 above).
3.  $\int/m = m/\int$  (see section 12.5 above).
4.  $\int/\text{m} = \text{m}/\int$  (see section 12.6 above).
5.  $\int/t = t/\int$  (see section 12.7 above).
6.  $\int/d = d/\int$  (see section 12.8 above).
7.  $\int/\text{t} = \text{t}/\int$  (see section 12.9 above).



8. ʃ/θ = θ/ʃ (see section 12.10 above).
9. ʃ/ð = ð/ʃ (see section 12.11 above).
10. ʃ/ð̣ = ð̣/ʃ (see section 12.12 above).
11. ʃ/k = k/ʃ (see section 12.13 above).
12. ʃ/g = g/ʃ (see section 12.14 above).
13. ʃ/x = x/ʃ (see section 12.15 above).
14. ʃ/ɣ = ɣ/ʃ (see section 12.16 above).
15. ʃ/ḳ = ḳ/ʃ (see section 12.17 above).
16. ʃ/n = n/ʃ (see section 12.18 above).
17. ʃ/r = r/ʃ (see section 12.19 above).
18. ʃ/l = l/ʃ (see section 12.20 above).
19. ʃ/ḷ = ḷ/ʃ (see section 12.21 above).
20. ʃ/s = s/ʃ (see section 12.22 above).
21. ʃ/z = z/ʃ (see section 12.23 above).
22. ʃ/ṣ = ṣ/ʃ (see section 12.24 above).
23. ʃ/č = č/ʃ (see section 12.25 above).
24. ʃ/ǰ = ǰ/ʃ (see section 12.26 above).
25. ʃ/h as in /'nɪʃər/ 'he published' - /'nɪhər/ 'he slaughtered'.
26. ʃ/ṣ as in /'rɑʃɪ/ 'sesame oil' - /'rɑṣɪ/ 'shepherd'.
27. ʃ/? as in /'buʃrə/ 'girl's name' - /'bu?rə/ 'focal point'.
28. ʃ/h as in /'rɑʃɪ/ 'sesame oil' - /'rɑhɪ/ 'ample'.
29. ʃ/i as in /'hɑʃɪr/ 'stuck' - /'hɑɪr/ 'bewildered'.
30. ʃ/u as in /'rɑʃɪ/ 'sesame oil' - /'rɑuɪ/ 'from Rawa (a town)'.

(c) In word-final position, /ʃ/ enters into the following distinctive oppositions:

1. ʃ/ɛ = ɛ/ʃ (see section 12.4 above).
2. ʃ/m = m/ʃ (see section 12.5 above).
3. ʃ/ṁ = ṁ/ʃ (see section 12.6 above).
4. ʃ/ṭ = ṭ/ʃ (see section 12.7 above).
5. ʃ/ḍ = ḍ/ʃ (see section 12.8 above).
6. ʃ/ṭ̥ = ṭ̥/ʃ (see section 12.9 above).
7. ʃ/θ = θ/ʃ (see section 12.10 above).
8. ʃ/ð = ð/ʃ (see section 12.11 above).
9. ʃ/ð̥ = ð̥/ʃ (see section 12.12 above).
10. ʃ/k = k/ʃ (see section 12.13 above).
11. ʃ/g = g/ʃ (see section 12.14 above).
12. ʃ/x = x/ʃ (see section 12.15 above).
13. ʃ/ɣ = ɣ/ʃ (see section 12.16 above).
14. ʃ/ḳ = ḳ/ʃ (see section 12.17 above).
15. ʃ/n = n/ʃ (see section 12.18 above).
16. ʃ/ṛ = ṛ/ʃ (see section 12.19 above).
17. ʃ/ḷ = ḷ/ʃ (see section 12.20 above).
18. ʃ/ḷ̥ = ḷ̥/ʃ (see section 12.21 above).
19. ʃ/s = s/ʃ (see section 12.22 above).
20. ʃ/z = z/ʃ (see section 12.23 above).
21. ʃ/ṣ = ṣ/ʃ (see section 12.24 above).
22. ʃ/č = č/ʃ (see section 12.25 above).
23. ʃ/ǰ = ǰ/ʃ (see section 12.26 above).
24. ʃ/ḥ as in /ɾiʃ/ 'feather(s)' - /ɾiḥ/ 'wind (n.)'.

25. /ʃ/ʳ as in /ʃaʃ/ 'cheesecloth' - /ʃaʳ/ 'it became wide-spread'.
26. /ʃ/? as in /ʃaʃ/ 'cheesecloth' - /ʃa?/ 'he wanted'.
27. /ʃ/h as in /ʃaʃ/ 'cheesecloth' - /ʃah/ 'Shah'.
28. /ʃ/i as in /ʃəʃ/ 'it deflated' - /ʃəi/ 'shade'.
29. /ʃ/u as in /həʃ/ 'he mowed (the lawn)' - /həu/ 'wild plant'.

### Summary:

The phoneme /ʃ/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally; i.e. /ʃ/ forms a total of 88 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.28. The Opposability of /h/.

The opposability of the phoneme /h/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /h/ enters into the following distinctive oppositions:

1. h/p = p/h (see section 12.2 above).
2. h/b = b/h (see section 12.3 above).
3. h/f = f/h (see section 12.4 above).
4. h/m = m/h (see section 12.5 above).
5. h/ṃ = ṃ/h (see section 12.6 above).
6. h/t = t/h (see section 12.7 above).
7. h/d = d/h (see section 12.8 above).

8.  $\hbar/\text{t} = \text{t}/\hbar$  (see section 12.9 above).
9.  $\hbar/\theta = \theta/\hbar$  (see section 12.10 above).
10.  $\hbar/\delta = \delta/\hbar$  (see section 12.11 above).
11.  $\hbar/\delta = \delta/\hbar$  (see section 12.12 above).
12.  $\hbar/k = k/\hbar$  (see section 12.13 above).
13.  $\hbar/g = g/\hbar$  (see section 12.14 above).
14.  $\hbar/x = x/\hbar$  (see section 12.15 above).
15.  $\hbar/\gamma = \gamma/\hbar$  (see section 12.16 above).
16.  $\hbar/k = k/\hbar$  (see section 12.17 above).
17.  $\hbar/n = n/\hbar$  (see section 12.18 above).
18.  $\hbar/r = r/\hbar$  (see section 12.19 above).
19.  $\hbar/s = s/\hbar$  (see section 12.22 above).
20.  $\hbar/z = z/\hbar$  (see section 12.23 above).
21.  $\hbar/\text{ſ} = \text{ſ}/\hbar$  (see section 12.24 above).
22.  $\hbar/\check{c} = \check{c}/\hbar$  (see section 12.25 above).
23.  $\hbar/\check{g} = \check{g}/\hbar$  (see section 12.26 above).
24.  $\hbar/\text{ſ} = \text{ſ}/\hbar$  (see section 12.27 above).
25.  $\hbar/\text{c}$  as in  $/\hbar\text{æd}/$  'limit (n.)' -  $/\text{c}\text{æd}/$  'he counted'.
26.  $\hbar/?$  as in  $/\text{h}\text{al}\text{æ}/$  'state or condition' -  $/\text{?al}\text{æ}/$  'instrument'.
27.  $\hbar/h$  as in  $/\hbar\text{æd}/$  'limit (n.)' -  $/\text{h}\text{æd}/$  'he let go'.
28.  $\hbar/i$  as in  $/\hbar\text{æd}/$  'limit (n.)' -  $/\text{i}\text{æd}/$  'hand (n.)'.
29.  $\hbar/u$  as in  $/\hbar\text{æd}/$  'limit (n.)' -  $/\text{u}\text{æd}/$  'he liked'.

(b) In word-medial position,  $/\hbar/$  enters into the following distinctive oppositions:

1.  $\hbar/b = b/\hbar$  (see section 12.3 above).
2.  $\hbar/f = f/\hbar$  (see section 12.4 above).

3.  $\hbar/m = m/\hbar$  (see section 12.5 above).
4.  $\hbar/\mathring{m} = \mathring{m}/\hbar$  (see section 12.6 above).
5.  $\hbar/t = t/\hbar$  (see section 12.7 above).
6.  $\hbar/d = d/\hbar$  (see section 12.8 above).
7.  $\hbar/\mathring{t} = \mathring{t}/\hbar$  (see section 12.9 above).
8.  $\hbar/\theta = \theta/\hbar$  (see section 12.10 above).
9.  $\hbar/\delta = \delta/\hbar$  (see section 12.11 above).
10.  $\hbar/\mathring{\delta} = \mathring{\delta}/\hbar$  (see section 12.12 above).
11.  $\hbar/k = k/\hbar$  (see section 12.13 above).
12.  $\hbar/g = g/\hbar$  (see section 12.14 above).
13.  $\hbar/x = x/\hbar$  (see section 12.15 above).
14.  $\hbar/\gamma = \gamma/\hbar$  (see section 12.16 above).
15.  $\hbar/\mathring{k} = \mathring{k}/\hbar$  (see section 12.17 above).
16.  $\hbar/n = n/\hbar$  (see section 12.18 above).
17.  $\hbar/r = r/\hbar$  (see section 12.19 above).
18.  $\hbar/l = l/\hbar$  (see section 12.20 above).
19.  $\hbar/\mathring{l} = \mathring{l}/\hbar$  (see section 12.21 above).
20.  $\hbar/s = s/\hbar$  (see section 12.22 above).
21.  $\hbar/z = z/\hbar$  (see section 12.23 above).
22.  $\hbar/\mathring{s} = \mathring{s}/\hbar$  (see section 12.24 above).
23.  $\hbar/\mathring{c} = \mathring{c}/\hbar$  (see section 12.25 above).
24.  $\hbar/\mathring{g} = \mathring{g}/\hbar$  (see section 12.26 above).
25.  $\hbar/j = j/\hbar$  (see section 12.27 above).
26.  $\hbar/\text{ʔ}$  as in /ʔə'hid/ 'I deviate from' - /ʔə'ʔid/ 'I repeat'.
27.  $\hbar/\text{ʔ}$  as in /'sɪhəl/ 'he dragged' - /'sɪʔəl/ 'he asked'.

28.  $\hbar/\hbar$  as in /'sɪ $\hbar$ əl/ 'he dragged' - /'sɪ $\hbar$ əl/ 'it became simple'.
29.  $\hbar/i$  as in /'rɑ $\hbar$ ə/ 'comfort (n.)' - /'rɑiə/ 'flag'.
30.  $\hbar/u$  as in /'rɑ $\hbar$ ə/ 'comfort (n.)' - /'rɑuə/ 'Rawa (a town)'.

(c) In word-final position, / $\hbar$ / enters into the following distinctive oppositions:

1.  $\hbar/\text{f}$  =  $\text{f}/\hbar$  (see section 12.4 above).
2.  $\hbar/\text{m}$  =  $\text{m}/\hbar$  (see section 12.5 above).
3.  $\hbar/\text{ṃ}$  =  $\text{ṃ}/\hbar$  (see section 12.6 above).
4.  $\hbar/\text{t}$  =  $\text{t}/\hbar$  (see section 12.7 above).
5.  $\hbar/\text{d}$  =  $\text{d}/\hbar$  (see section 12.8 above).
6.  $\hbar/\text{ṭ}$  =  $\text{ṭ}/\hbar$  (see section 12.9 above).
7.  $\hbar/\theta$  =  $\theta/\hbar$  (see section 12.10 above).
8.  $\hbar/\delta$  =  $\delta/\hbar$  (see section 12.11 above).
9.  $\hbar/\deltạ$  =  $\deltạ/\hbar$  (see section 12.12 above).
10.  $\hbar/\text{k}$  =  $\text{k}/\hbar$  (see section 12.13 above).
11.  $\hbar/\text{g}$  =  $\text{g}/\hbar$  (see section 12.14 above).
12.  $\hbar/\text{x}$  =  $\text{x}/\hbar$  (see section 12.15 above).
13.  $\hbar/\gamma$  =  $\gamma/\hbar$  (see section 12.16 above).
14.  $\hbar/\text{ḳ}$  =  $\text{ḳ}/\hbar$  (see section 12.17 above).
15.  $\hbar/\text{n}$  =  $\text{n}/\hbar$  (see section 12.18 above).
16.  $\hbar/\text{r}$  =  $\text{r}/\hbar$  (see section 12.19 above).
17.  $\hbar/\text{l}$  =  $\text{l}/\hbar$  (see section 12.20 above).
18.  $\hbar/\text{ḷ}$  =  $\text{ḷ}/\hbar$  (see section 12.21 above).
19.  $\hbar/\text{s}$  =  $\text{s}/\hbar$  (see section 12.22 above).
20.  $\hbar/\text{z}$  =  $\text{z}/\hbar$  (see section 12.23 above).



3.  $\text{ʃ}/\text{f} = \text{f}/\text{ʃ}$  (see section 12.4 above).
4.  $\text{ʃ}/\text{m} = \text{m}/\text{ʃ}$  (see section 12.5 above).
5.  $\text{ʃ}/\text{m̥} = \text{m̥}/\text{ʃ}$  (see section 12.6 above).
6.  $\text{ʃ}/\text{t} = \text{t}/\text{ʃ}$  (see section 12.7 above).
7.  $\text{ʃ}/\text{d} = \text{d}/\text{ʃ}$  (see section 12.8 above).
8.  $\text{ʃ}/\text{t̥} = \text{t̥}/\text{ʃ}$  (see section 12.9 above).
9.  $\text{ʃ}/\text{θ} = \text{θ}/\text{ʃ}$  (see section 12.10 above).
10.  $\text{ʃ}/\text{ð} = \text{ð}/\text{ʃ}$  (see section 12.11 above).
11.  $\text{ʃ}/\text{ð̥} = \text{ð̥}/\text{ʃ}$  (see section 12.12 above).
12.  $\text{ʃ}/\text{k} = \text{k}/\text{ʃ}$  (see section 12.13 above).
13.  $\text{ʃ}/\text{g} = \text{g}/\text{ʃ}$  (see section 12.14 above).
14.  $\text{ʃ}/\text{x} = \text{x}/\text{ʃ}$  (see section 12.15 above).
15.  $\text{ʃ}/\text{ɣ} = \text{ɣ}/\text{ʃ}$  (see section 12.16 above).
16.  $\text{ʃ}/\text{k̥} = \text{k̥}/\text{ʃ}$  (see section 12.17 above).
17.  $\text{ʃ}/\text{n} = \text{n}/\text{ʃ}$  (see section 12.18 above).
18.  $\text{ʃ}/\text{r} = \text{r}/\text{ʃ}$  (see section 12.19 above).
19.  $\text{ʃ}/\text{s} = \text{s}/\text{ʃ}$  (see section 12.22 above).
20.  $\text{ʃ}/\text{z} = \text{z}/\text{ʃ}$  (see section 12.23 above).
21.  $\text{ʃ}/\text{s̥} = \text{s̥}/\text{ʃ}$  (see section 12.24 above).
22.  $\text{ʃ}/\text{č} = \text{č}/\text{ʃ}$  (see section 12.25 above).
23.  $\text{ʃ}/\text{ǰ} = \text{ǰ}/\text{ʃ}$  (see section 12.26 above).
24.  $\text{ʃ}/\text{j} = \text{j}/\text{ʃ}$  (see section 12.27 above).
25.  $\text{ʃ}/\text{h} = \text{h}/\text{ʃ}$  (see section 12.28 above).
26.  $\text{ʃ}/\text{ʔ}$  as in  $/\text{ʃ}^{\text{ʔ}}\text{anɪ}/$  'from Ana (a town)' -  $/\text{ʔ}^{\text{ʃ}}\text{anɪ}/$  'I'.
27.  $\text{ʃ}/\text{h}$  as in  $/\text{ʃ}^{\text{h}}\text{əd}/$  'he counted' -  $/\text{h}^{\text{ʃ}}\text{əd}/$  'he let go'.
28.  $\text{ʃ}/\text{i}$  as in  $/\text{ʃ}^{\text{i}}\text{əd}/$  'he counted' -  $/\text{i}^{\text{ʃ}}\text{əd}/$  'hand (n.)'.



29.  $\text{r}/\text{u}$  as in  $/\text{r}\text{ə}\text{d}/$  'he counted' -  $/\text{u}\text{ə}\text{d}/$  'he liked'.

(b) In word-medial position,  $/\text{r}/$  enters into the following distinctive oppositions:

1.  $\text{r}/\text{b} = \text{b}/\text{r}$  (see section 12.3 above).
2.  $\text{r}/\text{f} = \text{f}/\text{r}$  (see section 12.4 above).
3.  $\text{r}/\text{m} = \text{m}/\text{r}$  (see section 12.5 above).
4.  $\text{r}/\text{m} = \text{m}/\text{r}$  (see section 12.6 above).
5.  $\text{r}/\text{t} = \text{t}/\text{r}$  (see section 12.7 above).
6.  $\text{r}/\text{d} = \text{d}/\text{r}$  (see section 12.8 above).
7.  $\text{r}/\text{t} = \text{t}/\text{r}$  (see section 12.9 above).
8.  $\text{r}/\text{θ} = \text{θ}/\text{r}$  (see section 12.10 above).
9.  $\text{r}/\text{ð} = \text{ð}/\text{r}$  (see section 12.11 above).
10.  $\text{r}/\text{ð} = \text{ð}/\text{r}$  (see section 12.12 above).
11.  $\text{r}/\text{k} = \text{k}/\text{r}$  (see section 12.13 above).
12.  $\text{r}/\text{g} = \text{g}/\text{r}$  (see section 12.14 above).
13.  $\text{r}/\text{x} = \text{x}/\text{r}$  (see section 12.15 above).
14.  $\text{r}/\text{γ} = \text{γ}/\text{r}$  (see section 12.16 above).
15.  $\text{r}/\text{k} = \text{k}/\text{r}$  (see section 12.17 above).
16.  $\text{r}/\text{n} = \text{n}/\text{r}$  (see section 12.18 above).
17.  $\text{r}/\text{r} = \text{r}/\text{r}$  (see section 12.19 above).
18.  $\text{r}/\text{l} = \text{l}/\text{r}$  (see section 12.20 above).
19.  $\text{r}/\text{l} = \text{l}/\text{r}$  (see section 12.21 above).
20.  $\text{r}/\text{s} = \text{s}/\text{r}$  (see section 12.22 above).
21.  $\text{r}/\text{z} = \text{z}/\text{r}$  (see section 12.23 above).
22.  $\text{r}/\text{ʒ} = \text{ʒ}/\text{r}$  (see section 12.24 above).
23.  $\text{r}/\text{č} = \text{č}/\text{r}$  (see section 12.25 above).

24.  $\text{ʃ}/\text{ǰ} = \text{ǰ}/\text{ʃ}$  (see section 12.26 above).
25.  $\text{ʒ}/\text{ʒ} = \text{ʒ}/\text{ʒ}$  (see section 12.27 above).
26.  $\text{ʰ}/\text{h} = \text{h}/\text{ʰ}$  (see section 12.28 above).
27.  $\text{ʔ}$  as in  $/\text{'sɪʔəl}/$  'he coughed' -  $/\text{'sɪʔəl}/$  'he asked'.
28.  $\text{h}$  as in  $/\text{'sɪʔəl}/$  'he coughed' -  $/\text{'sɪhəl}/$  'it became simple'.
29.  $\text{i}$  as in  $/\text{'jaʔɪl}/$  '(he) having lit' -  $/\text{'jaɪl}/$  '(he) having moved out'.
30.  $\text{u}$  as in  $/\text{'saʔə}/$  'watch (n.)' -  $/\text{'sauə}/$  'he equalled'.

(c) In word-final position,  $/\text{ʔ}/$  enters into the following distinctive oppositions:

1.  $\text{ʃ}/\text{f} = \text{f}/\text{ʃ}$  (see section 12.4 above).
2.  $\text{ʒ}/\text{m} = \text{m}/\text{ʒ}$  (see section 12.5 above).
3.  $\text{ʒ}/\text{ṃ} = \text{ṃ}/\text{ʒ}$  (see section 12.6 above).
4.  $\text{ʔ}/\text{t} = \text{t}/\text{ʔ}$  (see section 12.7 above).
5.  $\text{ʔ}/\text{d} = \text{d}/\text{ʔ}$  (see section 12.8 above).
6.  $\text{ʔ}/\text{ṭ} = \text{ṭ}/\text{ʔ}$  (see section 12.9 above).
7.  $\text{ʔ}/\text{θ} = \text{θ}/\text{ʔ}$  (see section 12.10 above).
8.  $\text{ʔ}/\text{ð} = \text{ð}/\text{ʔ}$  (see section 12.11 above).
9.  $\text{ʔ}/\text{ð̣} = \text{ð̣}/\text{ʔ}$  (see section 12.12 above).
10.  $\text{ʔ}/\text{k} = \text{k}/\text{ʔ}$  (see section 12.13 above).
11.  $\text{ʔ}/\text{g} = \text{g}/\text{ʔ}$  (see section 12.14 above).
12.  $\text{ʔ}/\text{x} = \text{x}/\text{ʔ}$  (see section 12.15 above).
13.  $\text{ʔ}/\text{ɣ} = \text{ɣ}/\text{ʔ}$  (see section 12.16 above).
14.  $\text{ʔ}/\text{ḳ} = \text{ḳ}/\text{ʔ}$  (see section 12.17 above).
15.  $\text{ʔ}/\text{n} = \text{n}/\text{ʔ}$  (see section 12.18 above).

16.  $\text{ʃ} / \text{ɕ} = \text{ɕ} / \text{ʃ}$  (see section 12.19 above).
17.  $\text{ʃ} / \text{l} = \text{l} / \text{ʃ}$  (see section 12.20 above).
18.  $\text{ʃ} / \text{ɭ} = \text{ɭ} / \text{ʃ}$  (see section 12.21 above).
19.  $\text{ʃ} / \text{s} = \text{s} / \text{ʃ}$  (see section 12.22 above).
20.  $\text{ʃ} / \text{z} = \text{z} / \text{ʃ}$  (see section 12.23 above).
21.  $\text{ʃ} / \text{ʂ} = \text{ʂ} / \text{ʃ}$  (see section 12.24 above).
22.  $\text{ʃ} / \text{ʧ} = \text{ʧ} / \text{ʃ}$  (see section 12.25 above).
23.  $\text{ʃ} / \text{ǰ} = \text{ǰ} / \text{ʃ}$  (see section 12.26 above).
24.  $\text{ʃ} / \text{ʝ} = \text{ʝ} / \text{ʃ}$  (see section 12.27 above).
25.  $\text{ʃ} / \text{ħ} = \text{ħ} / \text{ʃ}$  (see section 12.28 above).
26.  $\text{ʃ} / \text{ʔ}$  as in  $/\text{ʃaʃ}/$  'it became wide-spread' -  $/\text{ʃaʔ}/$  'he wanted'.
27.  $\text{ʃ} / \text{h}$  as in  $/\text{ʃaʃ}/$  'it became wide-spread' -  $/\text{ʃah}/$  'Shah'.
28.  $\text{ʃ} / \text{i}$  as in  $/\text{ǰaʃ}/$  'he felt hungry' -  $/\text{ǰai}/$  'coming (adj.)'.
29.  $\text{ʃ} / \text{u}$  as in  $/\text{'bɪləʃ}/$  'he swallowed' -  $/\text{'bɪləu}/$  'they accused'.

### Summary:

The phoneme  $/\text{ʃ}/$  is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally; i.e.  $/\text{ʃ}/$  forms a total of 88 different distinctive oppositions within the SIA system of phonological oppositions.

### 12.30: The Opposability of $/\text{ʔ}/$ .

The opposability of the phoneme  $/\text{ʔ}/$  within the SIA system of phonological oppositions is as follows:

- (a) In word-initial position,  $/\text{ʔ}/$  enters into the following

distinctive oppositions:

1.  $ʔ/p = p/ʔ$  (see section 12.2 above).
2.  $ʔ/b = b/ʔ$  (see section 12.3 above).
3.  $ʔ/ɸ = ɸ/ʔ$  (see section 12.4 above).
4.  $ʔ/m = m/ʔ$  (see section 12.5 above).
5.  $ʔ/m̥ = m̥/ʔ$  (see section 12.6 above).
6.  $ʔ/t = t/ʔ$  (see section 12.7 above).
7.  $ʔ/d = d/ʔ$  (see section 12.8 above).
8.  $ʔ/t̥ = t̥/ʔ$  (see section 12.9 above).
9.  $ʔ/θ = θ/ʔ$  (see section 12.10 above).
10.  $ʔ/ð = ð/ʔ$  (see section 12.11 above).
11.  $ʔ/ð̥ = ð̥/ʔ$  (see section 12.12 above).
12.  $ʔ/k = k/ʔ$  (see section 12.13 above).
13.  $ʔ/g = g/ʔ$  (see section 12.14 above).
14.  $ʔ/x = x/ʔ$  (see section 12.15 above).
15.  $ʔ/ɣ = ɣ/ʔ$  (see section 12.16 above).
16.  $ʔ/k̥ = k̥/ʔ$  (see section 12.17 above).
17.  $ʔ/n = n/ʔ$  (see section 12.18 above).
18.  $ʔ/ɾ = ɾ/ʔ$  (see section 12.19 above).
19.  $ʔ/s = s/ʔ$  (see section 12.22 above).
20.  $ʔ/z = z/ʔ$  (see section 12.23 above).
21.  $ʔ/s̥ = s̥/ʔ$  (see section 12.24 above).
22.  $ʔ/č = č/ʔ$  (see section 12.25 above).
23.  $ʔ/ǰ = ǰ/ʔ$  (see section 12.26 above).
24.  $ʔ/ʃ = ʃ/ʔ$  (see section 12.27 above).
25.  $ʔ/h = h/ʔ$  (see section 12.28 above).
26.  $ʔ/ʕ = ʕ/ʔ$  (see section 12.29 above).

27. ?/h as in /'ʔɪɣə/ 'he came' - /'hɪɣə/ 'he satirized or ridiculed (esp. in poetry)'.
28. ?/i as in /ʔə'mɪn/ 'safe' - /iə'mɪn/ 'oath'.
29. ?/u as in /'ʔəddə/ 'he carried out' - /'uəddə/ 'he sent'.

(b) In word-medial position, /ʔ/ enters into the following distinctive oppositions:

1. ?/b = b/? (see section 12.3 above).
2. ?/f = f/? (see section 12.4 above).
3. ?/m = m/? (see section 12.5 above).
4. ?/ṁ = ṁ/? (see section 12.6 above).
5. ?/t = t/? (see section 12.7 above).
6. ?/d = d/? (see section 12.8 above).
7. ?/ṭ = ṭ/? (see section 12.9 above).
8. ?/θ = θ/? (see section 12.10 above).
9. ?/ð = ð/? (see section 12.12 above).
10. ?/k = k/? (see section 12.13 above).
11. ?/g = g/? (see section 12.14 above).
12. ?/x = x/? (see section 12.15 above).
13. ?/ɣ = ɣ/? (see section 12.16 above).
14. ?/ḳ = ḳ/? (see section 12.17 above).
15. ?/n = n/? (see section 12.18 above).
16. ?/ɾ = ɾ/? (see section 12.19 above).
17. ?/l = l/? (see section 12.20 above).
18. ?/s = s/? (see section 12.22 above).
19. ?/z = z/? (see section 12.23 above).
20. ?/ṣ = ṣ/? (see section 12.24 above).

21. ?/č = č/? (see section 12.25 above).
22. ?/ǧ = ǧ/? (see section 12.26 above).
23. ?/ʃ = ʃ/? (see section 12.27 above).
24. ?/ħ = ħ/? (see section 12.28 above).
25. ?/ʕ = ʕ/? (see section 12.29 above).
26. ?/h as in /'sɪʔəɪ/ 'he asked' - /'sɪhəɪ/ 'it became simple'.
27. ?/i as in /'saʔɪɪ/ 'person who asks (questions)' - /'saiɪɪ/ '(it) having flowed'.
28. ?/u as in /'saʔət/ 'it or she became worse' - /'sauət/ 'it or she equalled'.

(c) In word-final position, /ʔ/ enters into the following distinctive oppositions:

1. ?/ɛ = ɛ/? (see section 12.4 above).
2. ?/m = m/? (see section 12.5 above).
3. ?/ṁ = ṁ/? (see section 12.6 above).
4. ?/t = t/? (see section 12.7 above).
5. ?/d = d/? (see section 12.8 above).
6. ?/ṭ = ṭ/? (see section 12.9 above).
7. ?/θ = θ/? (see section 12.10 above).
8. ?/ð = ð/? (see section 12.11 above).
9. ?/ḏ = ḏ/? (see section 12.12 above).
10. ?/k = k/? (see section 12.13 above).
11. ?/g = g/? (see section 12.14 above).
12. ?/x = x/? (see section 12.15 above).
13. ?/ɣ = ɣ/? (see section 12.16 above).

14. ?/ḳ = ḳ/? (see section 12.17 above).
15. ?/n = n/? (see section 12.18 above).
16. ?/ɾ = ɾ/? (see section 12.19 above).
17. ?/l = l/? (see section 12.20 above).
18. ?/ɭ = ɭ/? (see section 12.21 above).
19. ?/s = s/? (see section 12.22 above).
20. ?/z = z/? (see section 12.23 above).
21. ?/ʂ = ʂ/? (see section 12.24 above).
22. ?/ʃ̣ = ʃ̣/? (see section 12.25 above).
23. ?/ǰ = ǰ/? (see section 12.26 above).
24. ?/ʝ = ʝ/? (see section 12.27 above).
25. ?/ħ = ħ/? (see section 12.28 above).
26. ?/ʕ = ʕ/? (see section 12.29 above).
27. ?/h as in /'tnəbbəʔ/ 'he predicted' - /'tnəbbəh/ 'he became aware'.
28. ?/i as in /haʔ/ 'the name of the letter "h"' - /hai/ 'this one (f.)'.
29. ?/u as in /faʔ/ 'the name of the letter "f"' - /fau/ 'Faw (a town)'.

### Summary

The phoneme /ʔ/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 26 consonant phonemes and 2 vowel phonemes word-medially, and 27 consonant phonemes and 2 vowel phonemes word-finally; i.e. /ʔ/ forms a total of 86 different distinctive oppositions within the SIA system of phonological oppositions.

12.31. The Opposability of /h/.

The opposability of the phoneme /h/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /h/ enters into the following distinctive oppositions:

1. h/p = p/h (see section 12.2 above).
2. h/b = b/h (see section 12.3 above).
3. h/f = f/h (see section 12.4 above).
4. h/m = m/h (see section 12.5 above).
5. h/ṃ = ṃ/h (see section 12.6 above).
6. h/t = t/h (see section 12.7 above).
7. h/d = d/h (see section 12.8 above).
8. h/ṭ = ṭ/h (see section 12.9 above).
9. h/θ = θ/h (see section 12.10 above).
10. h/ð = ð/h (see section 12.11 above).
11. h/ḏ = ḏ/h (see section 12.12 above).
12. h/k = k/h (see section 12.13 above).
13. h/g = g/h (see section 12.14 above).
14. h/x = x/h (see section 12.15 above).
15. h/γ = γ/h (see section 12.16 above).
16. h/ḵ = ḵ/h (see section 12.17 above).
17. h/n = n/h (see section 12.18 above).
18. h/r = r/h (see section 12.19 above).
19. h/s = s/h (see section 12.22 above).
20. h/z = z/h (see section 12.23 above).
21. h/š = š/h (see section 12.24 above).



22. h/č = č/h (see section 12.25 above).
23. h/ǵ = ǵ/h (see section 12.26 above).
24. h/ʃ = ʃ/h (see section 12.27 above).
25. h/ħ = ħ/h (see section 12.28 above).
26. h/ʕ = ʕ/h (see section 12.29 above).
27. h/? = ?/h (see section 12.30 above).
28. h/i as in /həd/ 'he let go' - /iəd/ 'hand (n.)'.
29. h/u as in /həd/ 'he let go' - /uəd/ 'he liked'.

(b) In word-medial position, /h/ enters into the following distinctive oppositions:

1. h/b = b/h (see section 12.3 above).
2. h/f = f/h (see section 12.4 above).
3. h/m = m/h (see section 12.5 above).
4. h/ṁ = ṁ/h (see section 12.6 above).
5. h/t = t/h (see section 12.7 above).
6. h/d = d/h (see section 12.8 above).
7. h/ṭ = ṭ/h (see section 12.9 above).
8. h/θ = θ/h (see section 12.10 above).
9. h/ð = ð/h (see section 12.11 above).
10. h/ḏ = ḏ/h (see section 12.12 above).
11. h/k = k/h (see section 12.13 above).
12. h/g = g/h (see section 12.14 above).
13. h/x = x/h (see section 12.15 above).
14. h/γ = γ/h (see section 12.16 above).
15. h/ḵ = ḵ/h (see section 12.17 above).
16. h/n = n/h (see section 12.18 above).

17. h/r = r/h (see section 12.19 above).
18. h/l = l/h (see section 12.20 above).
19. h/ḷ = ḷ/h (see section 12.21 above).
20. h/s = s/h (see section 12.22 above).
21. h/z = z/h (see section 12.23 above).
22. h/š = š/h (see section 12.24 above).
23. h/č = č/h (see section 12.25 above).
24. h/ǧ = ǧ/h (see section 12.26 above).
25. h/ʃ = ʃ/h (see section 12.27 above).
26. h/h̄ = h̄/h (see section 12.28 above).
27. h/ʕ = ʕ/h (see section 12.29 above).
28. h/? = ?/h (see section 12.30 above).
29. h/i as in /'ʔahə/ 'sigh (n.)' - /'ʔaiə/ 'verse of the Koran'.
30. h/u as in /'ʔahə/ 'sigh (n.)' - /'ʔauə/ 'he sheltered'.

(c) In word-final position, /h/ enters into the following distinctive oppositions:

1. h/f = f/h (see section 12.4 above).
2. h/m = m/h (see section 12.5 above).
3. h/t = t/h (see section 12.7 above).
4. h/d = d/h (see section 12.8 above).
5. h/ṭ = ṭ/h (see section 12.9 above).
6. h/ḍ = ḍ/h (see section 12.11 above).
7. h/k = k/h (see section 12.13 above).
8. h/g = g/h (see section 12.14 above).
9. h/x = x/h (see section 12.15 above).

10. h/ɣ = ɣ/h (see section 12.16 above).
11. h/ɕ = ɕ/h (see section 12.17 above).
12. h/n = n/h (see section 12.18 above).
13. h/ɽ = ɽ/h (see section 12.19 above).
14. h/l = l/h (see section 12.20 above).
15. h/s = s/h (see section 12.22 above).
16. h/ɕ̣ = ɕ̣/h (see section 12.25 above).
17. h/ɕ̣̣ = ɕ̣̣/h (see section 12.26 above).
18. h/ɕ̣̣̣ = ɕ̣̣̣/h (see section 12.27 above).
19. h/ħ = ħ/h (see section 12.28 above).
20. h/ʕ = ʕ/h (see section 12.29 above).
21. h/? = ?/h (see section 12.30 above).
22. h/i as in /ǵah/ 'dignity' - /ǵai/ 'coming (adj.)'.

### Summary.

The phoneme /h/ is opposable to 27 consonant phonemes and 2 vowel phonemes word-initially, 28 consonant phonemes and 2 vowel phonemes word-medially, and 21 consonant phonemes and 1 vowel phoneme word-finally; i.e. /h/ forms a total of 81 different distinctive oppositions within the SIA system of phonological oppositions.

### (B) The SIA Vowel Phonemes

#### 12.32. The Opposability of /i/.

The opposability of the phoneme /i/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /i/ enters into the following distinctive oppositions:

1. i/u as in /'iæddə/ 'handle (n.)' - /'uæddə/ 'he sent'.
2. i/p = p/i (see section 12.2 above).
3. i/b = b/i (see section 12.3 above).
4. i/f = f/i (see section 12.4 above).
5. i/m = m/i (see section 12.5 above).
6. i/ṃ = ṃ/i (see section 12.6 above).
7. i/t = t/i (see section 12.7 above).
8. i/d = d/i (see section 12.8 above).
9. i/ṭ = ṭ/i (see section 12.9 above).
10. i/θ = θ/i (see section 12.10 above).
11. i/ð = ð/i (see section 12.11 above).
12. i/ḑ = ḑ/i (see section 12.12 above).
13. i/k = k/i (see section 12.13 above).
14. i/g = g/i (see section 12.14 above).
15. i/x = x/i (see section 12.15 above).
16. i/γ = γ/i (see section 12.16 above).
17. i/ḵ = ḵ/i (see section 12.17 above).
18. i/n = n/i (see section 12.18 above).
19. i/r = r/i (see section 12.19 above).
20. i/s = s/i (see section 12.22 above).
21. i/z = z/i (see section 12.23 above).
22. i/š = š/i (see section 12.24 above).
23. i/č = č/i (see section 12.25 above).
24. i/ǵ = ǵ/i (see section 12.26 above).

25. i/ɟ = ɟ/i (see section 12.27 above).
26. i/ħ = ħ/i (see section 12.28 above).
27. i/ʕ = ʕ/i (see section 12.29 above).
28. i/? = ?/i (see section 12.30 above).
29. i/h = h/i (see section 12.31 above).

(b) In word-medial position, /i/ enters into the following distinctive oppositions:

1. i/u as in /ʕid/ 'religious feast' - /ʕud/ 'matchstick'.
2. i/i as in /sim/ 'thin metal rod' - /sim/ 'poison (n.)'.
3. i/v as in /trid/ 'she wants' - /trud/ 'she replies'.
4. i/ə as in /sim/ 'thin metal rod' - /səm/ 'he poisoned'.
5. i/e as in /uil/ 'wheel' - /uel/ 'distress (n.)'.
6. i/o as in /'ʕiɣə/ 'wording (n.)' - /'ʕoɣə/ 'present (n.)'.
7. i/a as in /ʕid/ 'religious feast' - /ʕad/ 'he returned'.
8. i/b = b/i (see section 12.3 above).
9. i/f = f/i (see section 12.4 above).
10. i/m = m/i (see section 12.5 above).
11. i/ṁ = ṁ/i (see section 12.6 above).
12. i/t = t/i (see section 12.7 above).
13. i/d = d/i (see section 12.8 above).
14. i/ṭ = ṭ/i (see section 12.9 above).
15. i/θ = θ/i (see section 12.10 above).
16. i/ð = ð/i (see section 12.11 above).
17. i/ḏ = ḏ/i (see section 12.12 above).
18. i/k = k/i (see section 12.13 above).

19. i/g̃ = g̃/i (see section 12.14 above).
20. i/x = x/i (see section 12.15 above).
21. i/γ = γ/i (see section 12.16 above).
22. i/ḳ = ḳ/i (see section 12.17 above).
23. i/n = n/i (see section 12.18 above).
24. i/r = r/i (see section 12.19 above).
25. i/l = l/i (see section 12.20 above).
26. i/ḷ = ḷ/i (see section 12.21 above).
27. i/s = s/i (see section 12.22 above).
28. i/z = z/i (see section 12.23 above).
29. i/ṣ = ṣ/i (see section 12.24 above).
30. i/č = č/i (see section 12.25 above).
31. i/ǧ = ǧ/i (see section 12.26 above).
32. i/f = f/i (see section 12.27 above).
33. i/ḥ = ḥ/i (see section 12.28 above).
34. i/ʳ = ʳ/i (see section 12.29 above).
35. i/? = ?/i (see section 12.30 above).
36. i/h = h/i (see section 12.31 above).

(c) In word-final position, /i/ enters into the following distinctive oppositions:

1. i/u as in /həi/ 'alive' - /həu/ 'wild plant'.
2. i/r as in /ʔəuəd'di/ 'I send it or him' - /ʔə'uəddɪ/ 'I send'.
3. i/v as in /uəd'di/ 'send it or him! (sing. addressee)' - /'uəddu/ 'send! (pl. addressee)'.

4. i/ə as in /uəd'di/ 'send it or him! (sing. addressee)' -  
/'uəd'dɪ/ 'send! (sing. addressee)'.
5. i/a as in /uəd'di/ 'send it or him! (sing. addressee)' -  
/uəd'da/ 'he sent it or him'.
6. i/f = f/i (see section 12.4 above).
7. i/m = m/i (see section 12.5 above).
8. i/ṃ = ṃ/i (see section 12.6 above).
9. i/t = t/i (see section 12.7 above).
10. i/d = d/i (see section 12.8 above).
11. i/ṭ = ṭ/i (see section 12.9 above).
12. i/θ = θ/i (see section 12.10 above).
13. i/ð = ð/i (see section 12.11 above).
14. i/ḍ = ḍ/i (see section 12.12 above).
15. i/k = k/i (see section 12.13 above).
16. i/g = g/i (see section 12.14 above).
17. i/x = x/i (see section 12.15 above).
18. i/γ = γ/i (see section 12.16 above).
19. i/ḵ = ḵ/i (see section 12.17 above).
20. i/n = n/i (see section 12.18 above).
21. i/r = r/i (see section 12.19 above).
22. i/l = l/i (see section 12.20 above).
23. i/ḷ = ḷ/i (see section 12.21 above).
24. i/s = s/i (see section 12.22 above).
25. i/z = z/i (see section 12.23 above).
26. i/š = š/i (see section 12.24 above).
27. i/č = č/i (see section 12.25 above).

28. i/ǰ = ǰ/i (see section 12.26 above).
29. i/ʃ = ʃ/i (see section 12.27 above).
30. i/ħ = ħ/i (see section 12.28 above).
31. i/ʕ = ʕ/i (see section 12.29 above).
32. i/? = ?/i (see section 12.30 above).
33. i/h = h/i (see section 12.31 above).

Summary:

The phoneme /i/ is opposable to 1 vowel phoneme and 28 consonant phonemes word-initially, 7 vowel phonemes and 29 consonant phonemes word-medially, and 5 vowel phonemes and 28 consonant phonemes word-finally; i.e. /i/ forms a total of 98 different distinctive oppositions within the SIA system of phonological oppositions.

12.33. The Opposability of /u/.

The opposability of the phoneme /u/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /u/ enters into the following distinctive oppositions:

1. u/i = i/u (see section 12.32 above).
2. u/p = p/u (see section 12.2 above).
3. u/b = b/u (see section 12.3 above).
4. u/f = f/u (see section 12.4 above).
5. u/m = m/u (see section 12.5 above).
6. u/ṃ = ṃ/u (see section 12.6 above).
7. u/t = t/u (see section 12.7 above).



8. u/d = d/u (see section 12.8 above).
9. u/ṭ = ṭ/u (see section 12.9 above).
10. u/θ = θ/u (see section 12.10 above).
11. u/ð = ð/u (see section 12.11 above).
12. u/ð̣ = ð̣/u (see section 12.12 above).
13. u/k = k/u (see section 12.13 above).
14. u/g = g/u (see section 12.14 above).
15. u/x = x/u (see section 12.15 above).
16. u/ɣ = ɣ/u (see section 12.16 above).
17. u/ḳ = ḳ/u (see section 12.17 above).
18. u/n = n/u (see section 12.18 above).
19. u/r = r/u (see section 12.19 above).
20. u/s = s/u (see section 12.22 above).
21. u/z = z/u (see section 12.23 above).
22. u/ʂ = ʂ/u (see section 12.24 above).
23. u/č = č/u (see section 12.25 above).
24. u/ǰ = ǰ/u (see section 12.26 above).
25. u/ʃ = ʃ/u (see section 12.27 above).
26. u/ħ = ħ/u (see section 12.28 above).
27. u/ʕ = ʕ/u (see section 12.29 above).
28. u/? = ?/u (see section 12.30 above).
29. u/h = h/u (see section 12.31 above).

(b) In word-medial position, /u/ enters into the following distinctive oppositions:

1. u/i = i/u (see section 12.32 above).
2. u/r as in /ʕud/ 'matchstick' - /ʕɪd/ 'count!'.

3. u/u as in /ʃuʃ/ 'wool' - /ʃuʃ/ 'arrange in rows!'.
4. u/ə as in /ʃuʃ/ 'wool' - /ʃəʃ/ 'class (n.)'.
5. u/e as in /ʃuʃ/ 'wool' - /ʃeʃ/ 'summer'.
6. u/o as in /sug/ 'market' - /sog/ 'undignified (speech)'.
7. u/a as in /ʃud/ 'matchstick' - /ʃad/ 'he returned'.
8. u/b = b/u (see section 12.3 above).
9. u/f = f/u (see section 12.4 above).
10. u/m = m/u (see section 12.5 above).
11. u/ṁ = ṁ/u (see section 12.6 above).
12. u/t = t/u (see section 12.7 above).
13. u/d = d/u (see section 12.8 above).
14. u/ṭ = ṭ/u (see section 12.9 above).
15. u/θ = θ/u (see section 12.10 above).
16. u/ð = ð/u (see section 12.11 above).
17. u/ḏ = ḏ/u (see section 12.12 above).
18. u/k = k/u (see section 12.13 above).
19. u/g = g/u (see section 12.14 above).
20. u/x = x/u (see section 12.15 above).
21. u/ɣ = ɣ/u (see section 12.16 above).
22. u/ḵ = ḵ/u (see section 12.17 above).
23. u/n = n/u (see section 12.18 above).
24. u/r = r/u (see section 12.19 above).
25. u/l = l/u (see section 12.20 above).
26. u/ḷ = ḷ/u (see section 12.21 above).
27. u/s = s/u (see section 12.22 above).
28. u/z = z/u (see section 12.23 above).

29. u/ɣ̣ = ɣ̣/u (see section 12.24 above).
30. u/č̣ = č̣/u (see section 12.25 above).
31. u/ǰ̣ = ǰ̣/u (see section 12.26 above).
32. u/ʃ̣ = ʃ̣/u (see section 12.27 above).
33. u/ħ̣ = ħ̣/u (see section 12.28 above).
34. u/ʁ̣ = ʁ̣/u (see section 12.29 above).
35. u/?̣ = ?̣/u (see section 12.30 above).
36. u/ḥ = ḥ/u (see section 12.31 above).

(c) In word-final position, /u/ enters into the following distinctive oppositions:

1. u/i = i/u (see section 12.32 above).
2. u/ɾ as in /uəd'du/ 'send it or him! (pl. addressee)' - /'uəddɾ/ 'send! (sing. addressee)'.
3. u/v as in /uəd'du/ 'send it or him! (pl. addressee)' - /'uəddv/ 'send! (pl. addressee)'.
4. u/ə as in /uəd'du/ 'send it or him! (pl. addressee)' - /'uəddə/ 'he sent'.
5. u/a as in /uəd'du/ 'send it or him! (pl. addressee)' - /uəd'da/ 'he sent it or him'.
6. u/f = f/u (see section 12.4 above).
7. u/m = m/u (see section 12.5 above).
8. u/ṃ = ṃ/u (see section 12.6 above).
9. u/t = t/u (see section 12.7 above).
10. u/d = d/u (see section 12.8 above).
11. u/ṭ = ṭ/u (see section 12.9 above).
12. u/θ = θ/u (see section 12.10 above).

13. u/ð = ð/u (see section 12.11 above).
14. u/ð̥ = ð̥/u (see section 12.12 above).
15. u/k = k/u (see section 12.13 above).
16. u/g = g/u (see section 12.14 above).
17. u/x = x/u (see section 12.15 above).
18. u/ɣ = ɣ/u (see section 12.16 above).
19. u/ɕ = ɕ/u (see section 12.17 above).
20. u/n = n/u (see section 12.18 above).
21. u/r = r/u (see section 12.19 above).
22. u/l = l/u (see section 12.20 above).
23. u/ɭ = ɭ/u (see section 12.21 above).
24. u/s = s/u (see section 12.22 above).
25. u/z = z/u (see section 12.23 above).
26. u/ʂ = ʂ/u (see section 12.24 above).
27. u/č = č/u (see section 12.25 above).
28. u/ǰ = ǰ/u (see section 12.26 above).
29. u/ʃ = ʃ/u (see section 12.27 above).
30. u/ħ = ħ/u (see section 12.28 above).
31. u/ʕ = ʕ/u (see section 12.29 above).
32. u/? = ?/u (see section 12.30 above).

Summary:

The phoneme /u/ is opposable to 1 vowel phoneme and 28 consonant phonemes word-initially, 7 vowel phonemes and 29 consonant phonemes word-medially, 5 vowel phonemes and 27 consonant phonemes word-finally; i.e. /u/ forms a total of 97 different distinctive oppositions within the SIA phonological oppositions.

### 12.34 The Opposability of /ɪ/.

The opposability of the phoneme /ɪ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ɪ/ is not opposable to any of the SIA phonemes since it never occurs in this position.

(b) In word-medial position, /ɪ/ enters into the following distinctive oppositions:

1. ɪ/i = i/ɪ (see section 12.32 above).
2. ɪ/u = u/ɪ (see section 12.33 above).
3. ɪ/ʊ as in /'ɪbɛɾ/ 'lessons or warnings' - /'ʊbɛɾ/ 'he crossed over'.
4. ɪ/ə as in /'ɪbrɛ/ 'lesson or warning' - /'əbrɛ/ 'tears'.
5. ɪ/e as in /sɪɾ/ 'secret (n.)' - /sɛɾ/ 'watch strap'.
6. ɪ/o as in /'ɪɾɔ/ 'he listened attentively' - /'ɔɾɔ/ 'present (n.)'.
7. ɪ/a as in /sɪm/ 'poison (n.)' - /sɛm/ 'poisonous'.

(c) In word-final position, /ɪ/ enters into the following distinctive oppositions:

1. ɪ/i = i/ɪ (see section 12.32 above).
2. ɪ/u = u/ɪ (see section 12.33 above).
3. ɪ/ʊ as in /'hɪɪ/ 'a lady's ornaments' - /'hɪʊ/ 'sweet (adj.)'.
4. ɪ/ə as in /'ɛɪ/ 'boy's name' - /'ɛə/ 'on'.

5. ɪ/a as in /'uədɪ/ 'send! (sing. addressee)' - /uəd'da/ 'he sent it or him'.

Summary:

The phoneme /ɪ/ is opposable to 7 vowel phonemes word-medially, and 5 vowel phonemes word-finally; i.e. /ɪ/ forms a total of 12 different distinctive oppositions within the SIA system of phonological oppositions.

12.35. The Opposability of /ʊ/.

The opposability of the phoneme /ʊ/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ʊ/ is, like /ɪ/, not opposable to any of the SIA phonemes since it never occurs in this position.

(b) In word-medial position, /ʊ/ enters into the following distinctive oppositions:

1. ʊ/i = i/ʊ (see section 12.32 above).
2. ʊ/u = u/ʊ (see section 12.33 above).
3. ʊ/ɪ = ɪ/ʊ (see section 12.34 above).
4. ʊ/ə as in /hʊɾ/ 'free' - /həɾ/ 'hot weather'.
5. ʊ/e as in /ʃʊf/ 'arrange in rows!' - /ʃef/ 'summer'.
6. ʊ/o as in /ʃʊm/ 'close (your hand)! - /ʃom/ 'fasting (n.)'.
7. ʊ/a as in /hʊɾ/ 'free' - /hɑɾ/ 'hot'.

(c) In word-final position, /ʊ/ enters into the following distinctive oppositions:

1. u/i = i/u (see section 12.32 above).
2. u/u = u/u (see section 12.33 above).
3. u/ɪ = ɪ/u (see section 12.34 above).
4. u/ə as in /'sɪlɪu/ 'height' - /'sɪlɪə/ 'it or he became higher'.
5. u/a as in /'uədɪu/ 'send! (pl. addressee)' - /uəd'da/ 'he sent it or him'.

Summary:

The phoneme /u/ is opposable to 7 vowel phonemes word-medially, and 5 vowel phonemes word-finally; i.e. /u/ forms a total of 12 different distinctive oppositions within the SIA system of phonological oppositions.

12.36. The Opposability of /ə/.

The opposability of the phoneme /ə/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /ə/ is, like /ɪ/ and /u/, not opposable to any of the SIA phonemes since it never occurs in this position.

(b) In word-medial position, /ə/ enters into the following distinctive oppositions:

1. ə/i = i/ə (see section 12.32 above).
2. ə/u = u/ə (see section 12.33 above).
3. ə/ɪ = ɪ/ə (see section 12.34 above).
4. ə/ʊ = ʊ/ə (see section 12.35 above).

5. ə/e as in /həl/ 'solution' - /heɪ/ 'strength'.
6. ə/o as in /səm/ 'handful' - /sɒm/ 'fasting (n.)'.
7. ə/a as in /həd/ 'limit (n.)' - /hɑd/ 'sharp'.

(c) In word-final position, /ə/ enters into the following distinctive oppositions:

1. ə/i = i/ə (see section 12.32 above).
2. ə/u = u/ə (see section 12.33 above).
3. ə/ɪ = ɪ/ə (see section 12.34 above).
4. ə/ʊ = ʊ/ə (see section 12.35 above).
5. ə/a as in /'uədə/ 'he sent' - /uəd'da/ 'he sent it or him'.

#### Summary:

The phoneme /ə/ is opposable to 7 vowel phonemes word-medially, and 5 vowel phonemes word-finally; i.e. /ə/ forms a total of 12 different distinctive oppositions within the SIA system of phonological oppositions.

#### 12.37. The Opposability of /e/.

The opposability of the phoneme /e/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position and word-final position, /e/ is not opposable to any of the SIA phonemes since it never occurs in these positions.

(b) In word-medial position, on the other hand, /e/ enters into the following distinctive oppositions:



1. e/i = i/e (see section 12.32 above).
2. e/u = u/e (see section 12.33 above).
3. e/ɪ = ɪ/e (see section 12.34 above).
4. e/ʊ = ʊ/e (see section 12.35 above).
5. e/ə = ə/e (see section 12.36 above).
6. e/o as in /tɛf/ 'vision or phantasm' - /tɔf/ 'mud wall'.
7. e/a as in /ʃeɪ/ 'carrying (n.)' - /ʃaɪ/ 'he moved out'.

Summary:

The phoneme /e/ is opposable to 7 vowel phonemes in word-medial position only; i.e. /e/ forms a total of 7 different distinctive oppositions within the SIA system of phonological oppositions.

12.38. The Opposability of /o/.

The opposability of the phoneme /o/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position and word-final position, /o/ is, like /e/, not opposable to any of the SIA phonemes since it never occurs in these positions.

(b) In word-medial position, on the other hand, /e/ enters into the following distinctive oppositions:

1. o/i = i/o (see section 12.32 above).
2. o/u = u/o (see section 12.33 above).
3. o/ɪ = ɪ/o (see section 12.34 above).
4. o/ʊ = ʊ/o (see section 12.35 above).
5. o/ə = ə/o (see section 12.36 above).

6. o/e = e/o (see section 12.37 above).
7. o/a as in /xof/ 'fear (n.)' - /xaf/ 'he feared'.

Summary:

The phoneme /o/ is, like /e/, opposable to 7 vowel phonemes in word-medial position only; i.e. /o/ forms a total of 7 different distinctive oppositions within the SIA system of phonological oppositions.

12.39. The Opposability of /a/.

The opposability of the phoneme /a/ within the SIA system of phonological oppositions is as follows:

(a) In word-initial position, /a/ is, like /ɪ/, /ʊ/, /ə/, /e/ and /o/, not opposable to any of the SIA phonemes since it never occurs in this position.

(b) In word-medial position, /a/ enters into the following distinctive oppositions:

1. a/i = i/a (see section 12.32 above).
2. a/u = u/a (see section 12.33 above).
3. a/ɪ = ɪ/a (see section 12.34 above).
4. a/ʊ = ʊ/a (see section 12.35 above).
5. a/ə = ə/a (see section 12.36 above).
6. a/e = e/a (see section 12.37 above).
7. a/o = o/a (see section 12.38 above).

(c) In word-final position, /a/ enters into the following distinctive oppositions:

1. a/i = i/a (see section 12.32 above).
2. a/u = u/a (see section 12.33 above).
3. a/ɪ = ɪ/a (see section 12.34 above).
4. a/ʊ = ʊ/a (see section 12.35 above).
5. a/ə = ə/a (see section 12.36 above).

Summary:

The phoneme /a/ is opposable to 7 vowel phonemes word-medially, and 5 vowel phonemes word-finally; i.e. /a/ forms a total of 12 different distinctive oppositions within the SIA system of phonological oppositions.

12.40. Statistical Conclusions.

The above survey of the opposability (i.e. distinctive force) of the SIA phonemes yields the following statistical conclusions:

(A) The SIA Consonant Phonemes

(1) Each of the phonemes /f, t, d, ʈ, n, r/ forms a total of 83 distinctive oppositions with SIA consonant phonemes and a total of 6 distinctive oppositions with SIA vowel phonemes, i.e. each of the above consonant phonemes forms a sum total of 89 distinctive oppositions with the phonemes of the SIA phonological system.

(2) Each of the phonemes /k, g, x, γ, ǰ, ʃ, ħ, ʕ/ forms a total of 82 distinctive oppositions with SIA consonant phonemes and a total of 6 distinctive oppositions with SIA vowel phonemes, i.e. each of the above consonant phonemes forms a sum total of 88 distinctive

oppositions with the phonemes of the SIA phonological system.

(3) Each of the phonemes / m, θ, ð, k, s, ʃ / forms a total of 81 distinctive oppositions with SIA consonant phonemes and a total of 6 distinctive oppositions with SIA vowel phonemes, i.e. each of the above consonant phonemes forms a sum total of 87 distinctive oppositions with the phonemes of the SIA phonological system.

(4) Each of the phonemes / ɱ, z, ʒ, ʔ / forms a total of 80 distinctive oppositions with SIA consonant phonemes and a total of 6 distinctive oppositions with SIA vowel phonemes, i.e. each of the above consonant phonemes forms a sum total of 86 distinctive oppositions with the phonemes of the SIA phonological system.

(5) The consonant phoneme / ð / forms a total of 78 distinctive oppositions with other SIA consonant phonemes and a total of 6 distinctive oppositions with SIA vowel phonemes, i.e. / ð / forms a sum total of 84 distinctive oppositions with other phonemes of the SIA phonological system.

(6) The consonant phoneme / h / forms a total of 76 distinctive oppositions with other SIA consonant phonemes and a total of 5 distinctive oppositions with SIA vowel phonemes, i.e. / h / forms a sum total of 81 distinctive oppositions with other phonemes of the SIA phonological system.

(7) Each of the consonant phonemes / b, ɓ / forms a total of 56 distinctive oppositions with SIA consonant phonemes and a total

of 4 distinctive oppositions with SIA vowel phonemes, i.e. each of the consonant phonemes /b/ and /ɹ/ forms a sum total of 60 distinctive oppositions with the phonemes of the SIA phonological system.

(8) The consonant phoneme /ɹ/ forms a total of 47 distinctive oppositions with other SIA consonant phonemes and a total of 4 distinctive oppositions with SIA vowel phonemes, i.e. /ɹ/ forms a sum total of 51 distinctive oppositions with other phonemes of the SIA phonological system.

(9) The consonant phoneme /p/ forms a total of 39 distinctive oppositions with other SIA consonant phonemes and a total of 2 distinctive oppositions with SIA vowel phonemes, i.e. /p/ forms a sum total of 41 distinctive oppositions with other phonemes of the SIA phonological system.

Since the phonological system of SIA consists of 30 consonant phonemes and 8 vowel phonemes (see further above), each of the SIA consonant phonemes is potentially opposable to 29 phonemes within the consonant system and to a total of 37 phonemes (= 29 consonant phonemes + 8 vowel phonemes) within the whole of the SIA phonological system. This is potentially the case in each of the three word positions investigated above, viz. word-initially, word-medially and word-finally. In all these three positions, therefore, each SIA consonant phoneme can potentially form a total of 87 (= 29 x 3) distinctive oppositions within the consonant system, and a sum total of 111 (= 37 x 3) distinctive oppositions within the whole

of the SIA phonological system. Thus, the functional load of /t/, for example, is worked out as follows:

$$\frac{83 \times 100}{87} = 95\% \text{ within the SIA consonant system, and}$$

$$\frac{89 \times 100}{111} = 80\% \text{ within the whole of the SIA phonological system.}$$

Applying this calculation to each of the SIA consonant phonemes gives us the following percentages:<sup>(1)</sup>

(1) The consonant phonemes /f, t, d, ṭ, n, r/ have a functional load of 95% and 80%.

(2) The consonant phonemes /k, g, x, γ, ǧ, ʃ, ħ, ʕ/ have a functional load of 94% and 79%.

(3) The consonant phonemes /m, θ, ð, ḳ, s, ʂ/ have a functional load of 93% and 78%.

(4) The consonant phonemes /ṁ, z, č, ʔ/ have a functional load of 92% and 77%.

(5) The consonant phoneme /ð/ has a functional load of 90% and 76%.

(6) The consonant phoneme /h/ has a functional load of 87% and 73%.

(7) The consonant phonemes /b, l / have a functional load of 64% and 54% .

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(1) Throughout this section, percentages are, as in the previous example of /t/, given to the nearest whole number and in descending order of functional load. For a given phoneme (or group of phonemes) two percentages are given; the first corresponds to the functional load of the given phoneme(s) within the consonant system (or vowel system in the case of vowel phonemes) and the second corresponds to the functional load of the same phoneme(s) within the whole of the phonological system of SIA.

(8) The consonant phoneme /ɹ/ has a functional load of 54% and 46%.

(9) The consonant phoneme /p/ has a functional load of 45% and 37%.

### (B) The SIA Vowel Phonemes

(1) The vowel phoneme /i/ forms a total of 13 distinctive oppositions with other SIA vowel phonemes and a total of 85 distinctive oppositions with SIA consonant phonemes, i.e. /i/ forms a sum total of 98 distinctive oppositions with other phonemes of the SIA phonological system.

(2) The vowel phoneme /u/ forms a total of 13 distinctive oppositions with other SIA vowel phonemes and a total of 84 distinctive oppositions with SIA consonant phonemes, i.e. /u/ forms a sum total of 97 distinctive oppositions with other phonemes of the SIA phonological system.

(3) Each of the vowel phonemes /ɪ, ʊ, ə, a/ forms a total of 12 distinctive oppositions with SIA vowel phonemes but is not opposable to any of the SIA consonant phonemes, i.e. each of the above vowel phonemes forms a sum total of 12 distinctive oppositions with the phonemes of the SIA phonological system.

(4) The vowel phonemes /e, o/ are only opposable to each other and the other SIA vowel phonemes; however, this is only possible in word-medial position since /e/ and /o/ never occur word-initially or word-finally (see sections 12.37 and 12.38 respectively).

Thus, each of them forms a sum total of 7 distinctive oppositions with the rest of the SIA phonemes.

As stated further above, the SIA phonological system is composed of 8 vowel phonemes and 30 consonant phonemes. Therefore, each of the SIA vowel phonemes is potentially opposable to a total of 7 phonemes within the vowel system and to a total of 37 phonemes (= 7 vowel phonemes + 30 consonant phonemes) within the whole of the SIA phonological system. This is potentially the case in each of the three word positions investigated above, viz. word-initially, word-medially and word-finally. In all these three positions, therefore, each SIA vowel phoneme can potentially form a total of 21 (= 7 x 3) distinctive oppositions within the vowel system, and a sum total of 111 (= 37 x 3) distinctive oppositions within the whole of the SIA phonological system. Thus, the functional load of /i/, for example, is worked out as follows:

$$\frac{13 \times 100}{21} = 62\% \text{ within the SIA vowel system, and}$$

$$\frac{98 \times 100}{111} = 88\% \text{ within the whole of the SIA phonological system.}$$

Applying this calculation to each of the SIA vowel phonemes gives us the following percentages (see footnote (1) on page 464):

- (1) The vowel phoneme /i/ has a functional load of 62% and 88%.
- (2) The vowel phoneme /u/ has a functional load of 62% and 87%.
- (3) The vowel phonemes /ɪ, ʊ, ə, a/ have a functional load of 57% and 11%.



- (4) The vowel phonemes /e, o/ have a functional load of 33% and 6%.

In order to give a tabular representation of the above statistical survey of the opposability of the SIA phonemes, I shall use the following key:

- C: number of consonant phonemes that a given SIA phoneme is opposable to in a given word position,
- V: number of vowel phonemes that a given SIA phoneme is opposable to in a given word position,
- T<sub>1</sub>: total number of distinctive oppositions that a given SIA phoneme can form with SIA consonant phonemes word-initially, word-medially and word-finally,
- T<sub>2</sub>: total number of distinctive oppositions that a given SIA phoneme can form with SIA vowel phonemes word-initially, word-medially and word-finally,
- T<sub>3</sub>: sum total of distinctive oppositions that a given SIA phoneme can form within the whole of the SIA phonological system word-initially, word-medially and word-finally,
- P<sub>1</sub>: percentage of the functional load of a given SIA consonant or vowel phoneme within the consonant or vowel system, as the case may be, and
- P<sub>2</sub>: percentage of the functional load of a given SIA consonant or vowel phoneme within the whole of the SIA phonological system.

Thus, the statistics of the opposability of the SIA phonemes and their functional load may be summarized by the following table:

Phoneme	Initially		Medially		Finally		T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	P <sub>1</sub>	P <sub>2</sub>
	C	V	C	V	C	V					
/ɛ/	27	2	29	2	27	2	83	6	89	95%	80%
/t/	27	2	29	2	27	2	83	6	89	95%	80%
/a/	27	2	29	2	27	2	83	6	89	95%	80%
/t̥/	27	2	29	2	27	2	83	6	89	95%	80%
/n/	27	2	29	2	27	2	83	6	89	95%	80%
/s/	27	2	29	2	27	2	83	6	89	95%	80%
/k/	27	2	28	2	27	2	82	6	88	94%	79%
/g/	27	2	28	2	27	2	82	6	88	94%	79%
/x/	27	2	28	2	27	2	82	6	88	94%	79%
/ɣ/	27	2	29	2	26	2	82	6	88	94%	79%
/ʒ/	27	2	28	2	27	2	82	6	88	94%	79%
/ʃ/	27	2	28	2	27	2	82	6	88	94%	79%
/h/	27	2	28	2	27	2	82	6	88	94%	79%
/ʁ/	27	2	28	2	27	2	82	6	88	94%	79%
/m/	27	2	28	2	26	2	81	6	87	93%	78%
/θ/	27	2	28	2	26	2	81	6	87	93%	78%
/ð/	27	2	28	2	26	2	81	6	87	93%	78%
/k̥/	27	2	28	2	26	2	81	6	87	93%	78%
/s̥/	27	2	28	2	26	2	81	6	87	93%	78%
/ʃ̥/	27	2	28	2	26	2	81	6	87	93%	78%

Phoneme	Initially		Medially		Finally		T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	P <sub>1</sub>	P <sub>2</sub>
	C	V	C	V	C	V					
/m/	27	2	28	2	25	2	80	6	86	92%	77%
/z/	27	2	28	2	25	2	80	6	86	92%	77%
/č/	27	2	27	2	26	2	80	6	86	92%	77%
/ʀ/	27	2	26	2	27	2	80	6	86	92%	77%
/ð/	27	2	27	2	24	2	78	6	84	90%	76%
/n/	27	2	28	2	21	1	76	5	81	86%	73%
/b/	27	2	29	2	0	0	56	4	60	64%	54%
/l/	0	0	29	2	27	2	56	4	60	64%	54%
/ɫ/	0	0	27	2	20	2	47	4	51	54%	46%
/p/	27	2	12	0	0	0	39	2	41	45%	37%
/i/	28	1	29	7	28	5	85	13	98	62%	88%
/u/	28	1	29	7	27	5	84	13	97	62%	87%
/ɪ/	0	0	0	7	0	5	0	12	12	57%	11%
/ʊ/	0	0	0	7	0	5	0	12	12	57%	11%
/ə/	0	0	0	7	0	5	0	12	12	57%	11%
/a/	0	0	0	7	0	5	0	12	12	57%	11%
/e/	0	0	0	7	0	0	0	7	7	33%	6%
/o/	0	0	0	7	0	0	0	7	7	33%	6%

12.41. The Position of Maximum Differentiation in SIA.

In addition to the above statistical account of the functional load of the SIA phonemes, it is also important to work out which of the three word positions is the 'position of maximum differentiation' in the phonology of SIA. By totalling the number of distinctive oppositions that can occur in each word position (as presented in the above statistical table) and dividing it by 2, we get the following results:

(1) The number of different distinctive oppositions that can occur in word-initial position in SIA is 435.

(2) The number of different distinctive oppositions that can occur in word-medial position in SIA is 500.

(3) The number of different distinctive oppositions that can occur in word-final position in SIA is 434.

This means that the total number of distinctive oppositions which can occur in all the above three word positions is 1369.

Thus, a percentage<sup>(1)</sup> of the differentiability of each of the three word positions in SIA is as follows:

(1) Word-initially:

$$\frac{435 \cdot 100}{1369} = 31.78\%$$

(2) Word-medially:

$$\frac{500 \cdot 100}{1369} = 36.52\%$$

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(1) Percentages in this section are, unlike those in the previous section, given to the nearest second decimal number so as to preserve the very slight difference between the percentages of word-initial and word-final positions (see percentages further below).

(3) Word-finally:

$$\frac{434 \cdot x \cdot 100}{1369} = 31.70\%$$

These percentages clearly show that word-medial position is the position of maximum differentiation in the phonological system of SIA. The same conclusion can be reached through the following method:

Since the phonological system of SIA consists of a total of 38 phonemes, the potential number of possible oppositions in each word position is equal to  $38 \times (38-1)$  i.e. 703. Therefore, a percentage

$$\frac{\quad}{2},$$

of the differentiability of each of the three word positions in SIA is as follows:

(1) Word-initially:

$$\frac{435 \cdot x \cdot 100}{703} = 61.88\%$$

(2) Word-medially:

$$\frac{500 \cdot x \cdot 100}{703} = 71.12\%$$

(3) Word-finally:

$$\frac{434 \cdot x \cdot 100}{703} = 61.74\%$$

In conclusion, word-medial position is the 'position of maximum differentiation' in the phonological system of SIA.

## Chapter Thirteen

NEUTRALIZATION AND FREE VARIATION IN SIA(A) Neutralization<sup>(1)</sup>13.1. Introduction.

The non-occurrence of a given phonological opposition in one or more contexts is to be considered as a case of neutralization only if (a) the members of the given opposition are in exclusive relation and (b) neither member can occur in the given context(s). In other words, a phonological opposition which meets both of these conditions is said to be neutralizable in the given context(s). As we have seen in Chapter Four, the notion of 'neutralization' is always connected with the notion of the 'archiphoneme'.

Let us consider, for example, the opposition between SIA /p/ and /b/. The SIA phonemes /p/ and /b/ are said to be in exclusive relation since they are distinguished from each other by only one pair of relevant features (viz. "voiceless" vs "voiced") and, furthermore, they are alone in the SIA phonological system to share the relevant features "labial", "non-nasal", and "stop" (see sections 10.2 and 10.3 further above). Thus, SIA p/b meets condition (a) above. For SIA p/b to be considered as a neutralizable opposition, it has to meet condition (b) as well. The SIA p/b opposition

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(1) For a detailed account of the concepts of 'neutralization' and 'archiphoneme', see sections 4.3-4.13 further above.

does meet condition (b) above since neither /p/ nor /b/ occurs in word-final position. Therefore, SIA p/b is said to be a neutralizable opposition. The archiphoneme which occurs in word-final position (i.e. the position of neutralization) is, as we shall see later in this chapter, defined by the set of relevant features common to both /p/ and /b/, viz. "labial", "non-nasal", and "stop".

### 13.2: The Neutralization of the p/b Opposition in SIA.

As we have seen in the previous section, the p/b opposition is neutralizable in SIA since /p/ and /b/ are in exclusive relation and neither of them occurs in word-final position. In this position, i.e. the position of neutralization, an archiphoneme is said to occur. This archiphoneme is, according to the functionalist theory applied here, not to be identified with either of the respective opposition members, viz /p/ and /b/. Instead, this archiphoneme is, like all archiphonemes, to be regarded as a separate phoneme in the SIA phonological system. Moreover, this archiphoneme is definable by the sum of the relevant features common to both /p/ and /b/. Since /p/ is characterized by the relevant features "voiceless, labial, non-nasal, stop" and /b/ is characterized by the relevant features "voiced, labial, non-nasal, stop", the archiphoneme occurring in the position where SIA p/b is neutralized (i.e. in word-final position) is definable by the relevant features "labial, non-nasal, stop". This archiphoneme may, according to my notational conventions presented in section 7.2 further above, be symbolized as /P/. The archiphoneme /P/ is phonetically realized as follows: (a) It is realized as [p]

only in the SIA word for 'barrel', viz. [p<sup>h</sup>i:p] (phonemically /piP/).

(b) It is mostly realized as [b̥], for example [dʒa:b̥] 'he brought', [t<sup>h</sup>iʳəb̥] 'he felt tired', etc. (phonemically /ǰaP/ and /t<sup>h</sup>iʳəP/, respectively).

(c) It is also realized as [b̥] in the vicinity of *ɱ* consonants, for example [ʃo:b̥] 'side or direction', [ðʌb̥:] 'he tightened (sth.)', etc. (phonemically /ʃoP/ and /ðəP/, respectively).

To recapitulate, the opposition between SIA /p/ and /b/ is neutralized in word-final position where an archiphoneme definable as "labial, non-nasal, stop" and symbolized as /P/ is phonetically realized as [p], [b̥] or [b̥] (mostly as [b̥]).

### 13.3. The Neutralization of the m/n Opposition in SIA.

The m/n opposition is neutralizable in SIA since /m/ and /n/ are in exclusive relation (i.e. they are distinguished from each other by only one pair of relevant features, viz. "labial" vs. "non-labial" respectively, and they are alone in the SIA phonological system to share the relevant feature "nasal") and neither of them occurs before the labials /p, b, f, m, ɱ/. In this position, i.e. the position of neutralization, an archiphoneme is said to occur. This archiphoneme is not to be identified with either /m/ or /n/ but is to be considered as a separate phoneme in the SIA phonological system. Moreover, this archiphoneme is definable by the only relevant feature that is common to both /m/ and /n/, viz. "nasal". This "nasal" archiphoneme which occurs in



the position where SIA m/n is neutralized (i.e. before the labials /p, b, f, m, m/) may be symbolized as /M/.<sup>(1)</sup> The archiphoneme /M/ is phonetically realized as follows:

(a) It is realized as a 'non-mufəxxəm, bilabial' nasal, i.e. [m], when occurring before [p, b, m]. Examples:

(1) [mpəjjitʃ] (phonemically /'Mpəiɪtʃ/) is, in the Arabic script, spelt with an 'm' to mean 'slouching (adj.)', but it is spelt with an 'n' to mean 'we slouch'.

(2) ['mbəllɪl] (phonemically /'Mbəllɪl/) is, in the Arabic script, spelt with an 'm' to mean '(he) having wet (sb. or sth.)', but it is spelt with an 'n' to mean 'we wet (sb. or sth.)'.

(3) ['mməllɪh] (phonemically /'Mməllɪh/) is, in the Arabic script, spelt with an 'm' to mean '(he) having added salt to', but it is spelt with an 'n' to mean 'we add salt to'.

(b) It is realized as a 'mufəxxəm, bilabial' nasal, i.e. [m], when occurring before [p, b, m]. Examples:

(1) ['mpʌwwɪʃ] (phonemically /'Mpəuɪʃ/) is, in the Arabic script, spelt with an 'm' to mean '(he) having veiled (sb. or sth.)', but it is spelt with an 'n' to mean 'we veil (sb. or sth.)'.

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(1) A given archiphoneme may, according to my notational conventions presented in section 7.2 further above, be symbolized by the capital letter of the symbol of one of the respective opposition members; the choice being arbitrary. In other words, the archiphoneme occurring in the position where SIA m/n is neutralized may be symbolized as either /M/ or /N/. But /M/ is used in this thesis since the symbol 'N' has already been used to transcribe the 'uvular' realization of SIA /n/; see section 9.18 further above.

(2) ['m̥b̥ʌt̥t̥ɪl] (phonemically /'Mbət̥t̥ɪl/) is, in the Arabic script, spelt with an 'm' to mean '(he) having left work', but it is spelt with an 'n' to mean 'we leave work'.

(3) ['m̥m̥ʌð̥ð̥ɪ] (phonemically /'Mm̥əð̥ð̥ɪ/) is, in the Arabic script, spelt with an 'm' to mean '(he) having spent (time)', but it is spelt with an 'n' to mean 'we spend (time)'.

(c) It is realized as a 'non-ṡufəxxəm, labio-dental' nasal, i.e. [m̥] , when occurring before the 'non-ṡufəxxəm, labio-dental' fricative [f]. For example, ['m̥fət̥t̥ɪh] (phonemically /'Mfət̥t̥ɪh/) is, in the Arabic script, spelt with an 'm' to mean 'open (adj.)', but it is spelt with an 'n' to mean 'we open'.

(d) It is also realized as a 'ṡufəxxəm, labio-dental' nasal, i.e. [m̥], when occurring before the 'ṡufəxxəm, labio-dental' fricative [f]. For example, ['m̥f̥ʌð̥ð̥ɪl] (phonemically /'Mf̥əð̥ð̥ɪl/) is, in the Arabic script, spelt with an 'm' to mean '(he) having preferred (sth. to sth. else)', but it is spelt with an 'n' to mean 'we prefer (sth. to sth. else)'.

To recapitulate, the opposition between SIA /m/ and /n/ is neutralized before the labials /p, b, f, m, m̥/ where a "nasal" archiphoneme symbolized as /M/ is phonetically realized as [m] or [m̥] before /p, b /, as [m] before /m/, as [m̥] before /m̥/, and as [m̥] or [m̥] before /f/.

#### 13.4. The Neutralization of the 1/1 Opposition in SIA.

The 1/1 opposition is neutralizable in SIA since /1/ and /1/ are in exclusive relation (i.e. they are distinguished from each other by only one pair of relevant features, viz. "non-ṡufəxxəm"

vs. "mufəxxəm" respectively, and they are alone in the SIA phonological system to share the relevant feature "lateral"), and neither of them occurs in word-initial position. In this position, i.e. the position of neutralization, an archiphoneme is said to occur. This archiphoneme is not to be identified with either /l/ or /ɭ/ but is to be regarded as a separate phoneme in the SIA phonological system. Moreover, this archiphoneme is definable by the only relevant feature that is common to both /l/ and /ɭ/, viz. "lateral". This "lateral" archiphoneme which occurs in the position where SIA l /ɭ/ is neutralized, i.e. in word-initial position, may be symbolized as /L/. The archiphoneme /L/ is always realized as a 'non-mufəxxəm' lateral, i.e. [l]. For example, a native speaker of SIA pronounces the SIA word for 'he blamed', i.e. /Lam/, as [lã:m] and not \* [ɭã:m], and the SIA word for 'why?', i.e. /Leʃ/, as [le:ʃ] and not \* [ɭe:ʃ], and so on.

To recapitulate, the opposition between SIA /l/ and /ɭ/ is neutralized in word-initial position where a "lateral" archiphoneme symbolized as /L/ is phonetically always realized as [l].

### 13.5. The Neutralization of the e/o Opposition in SIA.

The e/o opposition is neutralizable in SIA since /e/ and /o/ are in exclusive relation (i.e. they are distinguished from each other by only one pair of relevant features, viz. "front" vs. "back" respectively, and they are alone in the SIA phonological system to share the relevant feature "fourth-degree aperture"), and neither of them occurs in final position in polysyllabic words. In

this position, i.e. the position of neutralization, an archiphoneme is said to occur. This archiphoneme is not to be identified with either /e/ or /o/ but is to be regarded as a separate phoneme in the SIA phonological system. Moreover, this archiphoneme is definable by the only relevant feature that is common to both /e/ and /o/, viz. "fourth-degree aperture". This archiphoneme occurs in the position where SIA e/o is neutralized, i.e. in final position in polysyllabic words, and it may be symbolized as /E/. The archiphoneme /E/ is phonetically realized as follows:

(a) It is realized as 'front', i.e. as [e:] or optionally [e:ə], when occurring in final unaccented syllables. For example, a native speaker of SIA pronounces the SIA word for 'on it or him' i.e. /'sə1E/, as ['sə1e:] (or optionally ['sə1e:ə]) and not \*['sə1o:] or \*['sə1o:ə].

(b) It is realized as 'back', i.e. as [o:] or optionally [o:ə], when occurring in final accented syllables. For example, a native speaker of SIA pronounces the SIA word for 'they came to him', i.e. /ʔɪ'ǧE/, as [ʔɪ'dʒo:] (or optionally [ʔɪ'dʒo:ə]) and not \*[ʔɪ'dʒe:] or \*[ʔɪ'dʒe:ə].

To recapitulate, the opposition between SIA /e/ and /o/ is neutralized in final position in polysyllabic words where an archiphoneme definable by the one relevant feature "fourth-degree aperture" and symbolized as /E/ is phonetically realized as 'front' (i.e. [[e:] or optionally [e:ə]) in final unaccented syllables and as 'back' (i.e. [[o:] or optionally [o:ə]) in final accented syllables.

(B) Free Variation13.6. Introduction.

Free variation is another phenomenon that plays an important role in the phonology of SIA. By 'free variation' I mean (a) the speaker's erratic use of one or the other realization of one and the same phoneme without yielding different semantic units, or (b) the speaker's erratic use of one or the other phoneme without yielding different semantic units.<sup>(1)</sup> An example of type (a) is the free variation that exists between SIA [e:] and [e:ə], which are free (i.e. optional) variants of /e/ as we have seen in sections 8.18 and 9.38 further above. For example, native speakers of SIA erratically use [ʃe:f] or [ʃe:əf] (both phonemically transcribed as /ʃef/) to mean 'summer'. On the other hand, an example of free variation of type (b) is the free variation that exists between SIA /g/ and /ǵ/. For example, native speakers of SIA erratically use /'gɪdɪr/ or /'ǵɪdɪr/ to mean 'sauce-pan'.

According to my non-segmental notation presented in section 7.3 further above, free variation is indicated by the symbol ~, i.e. the above examples can be presented as follows:

- (a) [e:] ~ [e:ə] and consequently [ʃe:f] ~ [ʃe:əf] 'summer'.  
 (b) /g/ ~ /ǵ/ and consequently /'gɪdɪr/ ~ /'ǵɪdɪr/ 'sauce-pan'.

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(1) M.R. Key refers to examples of type (b) by the term '(phoneme) fluctuation' which she defines as "the optional use of one phoneme or another in a given word or morpheme". See Key's article "Phonemic Pattern and Phoneme Fluctuation in Bolivian Chama (Tacanan)" in La linguistique 1968, pp. 35-48; the above quotation is found on p. 44 of this article. During a discussion I had with A. Martinet in March 1980, I sensed Martinet's agreement with Key's views on the so-called 'phoneme fluctuation'.

Since cases of free variation of type (a) have already been dealt with in connexion with individual phonemes in Chapter Nine further above, the present Chapter will only deal with cases of free variation of type (b), e.g. /g/ ~ /ǧ/.

### 13.7. The Free Variation between SIA /p/ and /b/.

Native speakers of SIA may erratically use the phoneme /p/ in free variation with the phoneme /b/ without yielding different semantic units. Examples of this are words like /paʃ/ ~ /baʃ/ 'bus'; /pai'sɪkɪl/ ~ /bai'sɪkɪl/ 'bicycle'; and so on. Examples of free variation between SIA /p/ and /b/ are not many due to the very low functional load of /p/, which mainly occurs in loan words, i.e. /p/ ~ /b/ is used in a limited number of words.

### 13.8. The Free Variation between SIA /p/ and /f/.

In a very limited number of cases, native speakers of SIA may erratically use the phoneme /p/ in free variation with the phoneme /f/ without yielding different semantic units. Examples of this are words like /'pɪrʃə/ ~ /'fɪrʃə/ 'brush (n.)'; /'pərdə/ ~ /'fərdə/ 'curtain'; and so on. Such examples of free variation are very rare in SIA due to, once again, the very low functional load of /p/.

### 13.9 The Free Variation between SIA /m/ and /ɱ/.

In some cases, native speakers of SIA may erratically use the phoneme /m/ in free variation with the phoneme /ɱ/ (usually in the vicinity of other *ɱ*-consonants) without yielding different semantic units. Examples of this are words like /ʃam/ ~

/ʃam/ 'he fasted'; /dom/ ~ /dɔm/ 'always'; and so on. Such examples indicate the occurrence of /m/ ~ /ɱ/ in SIA.

### 13.10. The Free Variation between SIA /k/ and /č/.

In many cases, native speakers of SIA may erratically use the phoneme /k/ in free variation with the phoneme /č/ without yielding different semantic units. For example, /k/ may erratically be used in free variation with /č/ in words like /kan/ ~ /čan/ 'he was'; /kəd/ ~ /čəd/ 'he worked very hard'; and so on. Such examples are to be regarded as cases of free variation between SIA /k/ and /č/. Free variation between SIA /k/ and /č/ occurs more frequently than between /p/ and /ɸ/ for example, i.e. /k/ ~ /č/ is more common than /p/ ~ /ɸ/.

### 13.11. The Free Variation between SIA /g/ and /ḳ/.

In many cases, native speakers of SIA may erratically use the phoneme /g/ in free variation with the phoneme /ḳ/ without yielding different semantic units. For example, /g/ may erratically be used in free variation with /ḳ/ in words like /sag/ ~ /saḳ/ 'he drove'; /'sɪgə/ ~ /'sɪḳə/ 'he watered'; and so on. Such examples are to be regarded as cases of free variation between SIA /g/ and /ḳ/. Examples of /g/ ~ /ḳ/ are abundant in SIA.

### 13.12. The Free Variation between SIA /g/ and /ğ/.

In a few cases, native speakers of SIA may erratically use the phoneme /g/ in free variation with /ğ/ without yielding different

semantic units. For example, SIA /g/ may erratically be used in free variation with SIA /ǧ/ in words like /'gɪdɪɾ/ ~ /'ǧɪdɪɾ/ 'sauce-pan'; /ba'gɪllə/ ~ /ba'ǧɪllə/ 'broad beans'; and so on. Such examples are to be regarded as cases of free variation between SIA /g/ and /ǧ/. Examples of /g/ ~ /ǧ/ are not frequent in SIA.

### 13.13. The Free Variation between SIA /ɪ/ and /ɪ̣/.

In many cases, native speakers of SIA may erratically use the phoneme /ɪ/ in free variation with the phoneme /ɪ̣/ without yielding different semantic units. For example, SIA /ɪ/ may erratically be used in free variation with /ɪ̣/ in words like /'xɪlə/ ~ /'xɪ̣lə/ 'it was empty'; /'buʂəɪ/ ~ /'buʂəɪ̣/ 'onion'; and so on. Such examples are to be regarded as cases of free variation between SIA /ɪ/ and /ɪ̣/. The free variation between SIA /ɪ/ and /ɪ̣/ is very common.

### 13.14. The Free Variation between SIA /s/ and /ṣ/.

Native speakers of SIA may, in some cases, erratically use the phoneme /s/ in free variation with the phoneme /ṣ/ without yielding different semantic units. For example, SIA /s/ may erratically be used in free variation with /ṣ/ in words like /'sʊɾə/ ~ /'ṣʊɾə/ 'complete piece of the Koran'; /'həsɾə/ ~ /'həṣɾə/ 'sigh (n.)'; and so on. Such examples are to be regarded as cases of free variation between SIA /s/ and /ṣ/. Examples of /s/ ~ /ṣ/ are not very common in SIA.



phonemes that are involved in the above cases of free variation shows that the phonemes concerned in each case are somehow phonologically related to each other. The details are as follows:

(1) The SIA phonemes /p/ and /b/ are phonologically related to each other in the sense that they share the relevant features "labial, non-nasal, stop"; they are kept apart on the basis that /p/ is "voiceless" while /b/ is "voiced".

(2) The SIA phonemes /p/ and /ɸ/ are phonologically related to each other in the sense that they share the relevant features "labial, non-nasal"; they are kept apart on the basis that /p/ is a "stop" while /ɸ/ is a "fricative".

(3) The SIA phonemes /m/ and /ṁ/ are phonologically related to each other in the sense that they share the relevant feature "labial"; they are kept apart on the basis that /m/ is "non-ṁufəxxəm" whereas /ṁ/ is "ṁufəxxəm".

(4) The SIA phonemes /k/ and /ç/ are phonologically related to each other in the sense that they share the relevant features "voiceless, stop"; they are kept apart on the basis that /k/ is "dorsal" whereas /ç/ is a "hush".

(5) The SIA phonemes /g/ and /ḳ/ are phonologically related to each other in the sense that they share the relevant feature "dorsal"; they are kept apart on the basis that /g/ is "non-ṁufəxxəm" while /ḳ/ is "ṁufəxxəm".

(6) The SIA phonemes /g/ and /ğ/ are phonologically related to each other in the sense that they share the relevant features "voiced, stop"; they are kept apart on the basis that /g/ is

"dorsal" whereas /ǰ/ is a "hush".

(7) The SIA phonemes /l/ and /ɭ/ are phonologically related to each other in the sense that they share the relevant feature "lateral"; they are kept apart on the basis that /l/ is "non-*ṃufəxxəm*" while /ɭ/ is "*ṃufəxxəm*".

(8) The SIA phonemes /s/ and /ʃ/ are phonologically related to each other in the sense that they share the relevant feature "hiss"; they are kept apart on the basis that /s/ is "non-*ṃufəxxəm*" whereas /ʃ/ is "*ṃufəxxəm*".

(9) The SIA phonemes /ɪ/ and /ʊ/ are phonologically related to each other in the sense that they share the relevant feature "second-degree aperture"; they are kept apart on the basis that /ɪ/ is "front" while /ʊ/ is "back".

(10) The SIA phonemes /ə/ and /a/ are phonologically related to each other in the sense that each of them is characterized by only one relevant feature: "third-degree aperture" in the case of /ə/ and "fifth-degree aperture" in the case of /a/; they are kept apart on the basis of the "third-degree aperture"/"fifth-degree aperture" distinction.

In conclusion, the phenomenon of 'free variation' in SIA takes place between "voiceless" and "voiced" phonemes that share the same distinctive property of localization in the case of /p/ ~ /b/ (the distinctive property of localization being "labial"); between "stop" and "fricative" phonemes that share the same distinctive property of localization in the case of /p/ ~ /f/ (the distinctive property of localization being "labial"); between "non-*ṃufəxxəm*"

and "mufəxxəmə" phonemes that share the same distinctive property of localization in the case of /m/ ~ /ḡ/ (the distinctive property of localization being "labial"), /g/ ~ /ḡ/ (the distinctive property of localization being "dorsal"), /l/ ~ /ḡ/ (the distinctive property of localization being "lateral"), and /s/ ~ /ḡ/ (the distinctive property of localization being "hiss"); between "dorsal" and "hush" phonemes in the case of /k/ ~ /č/ (which share the relevant features "voiceless, stop") and /g/ ~ /ǧ/ (which share the relevant features "voiced, stop"); between "front" and "back" vowel phonemes that share the relevant feature "second-degree aperture" in the case of /ɪ/ ~ /ʊ/; and between a vowel phoneme of a "third-degree aperture" and another of a "fifth-degree aperture" in the case of /ə/ ~ /a/ (which share no relevant features).<sup>(1)</sup>

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(1) M.R. Key expresses her views on the relation between the phonemes that are in free variation (i.e. fluctuation, in her terminology) as follows:

"The fluctuation between phonemes follows certain patterns. Only certain exchanges are allowed within certain series and orders. The phonemes must be similar in some way, either by points or manner of articulation. For example, there is fluctuation between certain labials; between some of the stop series; between some of the fricatives; between central and front vowels, etc."  
 [op. cit., p. 46].

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