A PHONOLOGICAL DESCRIPTION OF MODERN STANDARD ARABIC

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A Phonological Description

of

Modern Standard Arabic

by

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ABSTRACT.

The present work is concerned with some aspects of the phonology of Modern Standard Arabic.

The thesis is divided into two parts: Part I, dealing with the theoretical background, consists of three chapters, and each chapter sub-branches into a number of smaller units. Chapter I is concerned with the Axiomatic Functionalism principle of maintaining a strict distinction between the linguistic theory, linguistic descriptions, and the speech-phenomena; it also deals with the 'hypothetico-deductive method' which sets out to explain the philosophical principles underlying the 'Axiomatic Functionalist' approach. This chapter is divided into three sections, the first deals with the 'structure of the theory', the second concerns 'linguistic description and the speech-phenomena', followed by the 'criterion for evaluating the linguistic description and theory'. Chapter II treats the classification of semiotic systems in Axiomatic Functionalism as well as explaining the definition of 'Language' as "a semiotic system with a double articulation" (Mulder 1968, 'b'). Though this is a type of definition found in most functionalists approaches (Martinet 1962 and 1964), in Axiomatic Functionalism it has a unique interpretation. Chapter III, which deals with a brief explanation of the phonological system as a whole, comprises two sections, the first of which discusses 'phonematics and phonotactics', and the second introduces some of the main theoretical notions of the phonological theory, such as the notions "phoneme", "distinctive feature", "archi-phoneme", "position", "distributional unit", "archi-position", which is relevant for the phonological description of Modern Standard Arabic.

This introduction to the phonological sub-component of the theory is important because description cannot take place without the knowledge of a theory, since a description is "the application of a particular linguistic theory to a selected field of linguistic-phenomena" (Mulder 1980, b).

Part II, dealing with the phonological description, consists of five chapters (Chaps. IV - VIII). Chapter IV treats the distributional unit(s) and archi-position of Modern Standard Arabic. Chapter V deals with the consonantal phonemes, their identities and distinctive functions, as well as their realisations. Chapter VI explains the types of neutralisation and the consonantal archi-phonemes. Chapter VII deals with the vowel and semi-vowel phonemes, their identities and distinctive function as well as their realisations. Chapter VIII deals with the neutralisation and vocalic archi-phonemes.

DECLARATION

I, HEREBY DECLARE that the present work which is a record of research performed by myself, was conducted under the supervision of Mr. M. Y. H. Suleiman, Department of Linguistics, University of St. Andrews to which I was admitted as a research student under the M.Litt Resolution of the University Court, 1967, No. 9, and as a candidate for the degree of Master of Letters in October, 1979.

I also declare that this thesis embodies work which is being made public for the first time, and which has not been accepted previously for any degree.

Sami J. Sitrak.

CERTIFICATE.

I, HEREBY CERTIFY that the conditions of the Resolution and Regulations concerning the submission of an M.Litt. thesis have been fulfilled by Mr. Sami J. Sitrak.

Supervisor.

ACKNOWLEDGEMENTS.

I would like to offer my sincere gratitude and indebtedness to my supervisor, Mr. M. Y. H. Suleiman of the Department of Linguistics, University of St. Andrews, for the constant and thoughtful attention, valuable suggestions and guidance he offered me in the course of writing this thesis.

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I am very grateful to my father, my mother, my sister and all my brothers for their constant encouragement.

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INTRODUCTION.

Arabic is a semitic language. It is, with its rich literary heritage, one of the major languages of the world. Since the middle ages it has enjoyed a universality that makes it one of the world's great languages along with Greek and Latin; English, French, Spanish, and Russian. This status is reflected not only by the number of Arabic speakers, but also by the place this language has occupied in history and the important role it has played - and is still playing - in the development of Arab-Muslim society.

Arabic is spoken by about one hundred and forty million people inhabiting a wide and important area of the Middle East. It is the national language of the North African countries, the East-Mediterranean countries, and the countries of the Arabian Peninsula.

It is a known fact that Arabic did not receive the attention of western scholars until the beginning of the 19th century. The process of evolution through which the language has passed from its early beginning to the present continues to be an important and fruitful field of study.

There are three types of Arabic:

1) The classical Arabic of medieval times in which a wealth of literature is written. It was the language of pre-Islamic poetry and Qur?ān, and gradually became standardized after its codification. The Classical Arabic was the language of administration and science. One of the earliest and most complete studies of classical Arabic was done by Sībawaih in his great work known as al-Kitāb 'The Book'.

2) Modern Standard Arabic which is common to all Arabic-speaking countries today. It is based on and inspired by the classical Arabic of medieval times and has similar phonology, syntax and morphology, although it has incorporated new vocabulary. Mclaughlin (1972) refers to Modern Standard Arabic as: "that variety of Arabic that is found in contemporary books, newspapers, and magazines, and that is used orally in formal speeches, public lectures, learned debates, religious ceremonials and in news broadcasts over radio and television." Notwithstanding the unanimous acceptability of Modern Standard Arabic and its general adoption as the common medium of communication throughout the Arab world, it is not the everyday speech of the people.

3) Dialectal Arabic which consists of a large number of dialects, each of which has features unique to it, and other features which are characteristic of other varieties of Arabic.

The aim of this work is to present a phonological description of Modern Standard Arabic. Mulder's "Axiomatic Functionalist" theory provides the theoretical foundation of this work. Phonological theory is a sub-decipline of Axiomatic Functionalism, because this theory, as a theory for linguistic description, covers not only phonology, the aspect with which this thesis is concerned, but also syntax, morphology and semantics. By the aid of this theory, which defines its terms rigorously, the writer has tried to give a satisfactory account of aspects of the phonology of Modern Standard Arabic.

CONTENTS.

PART ONE

CHAPTER I

The Axiomatic Functionalist Approach.

The theory, or sub part of the theory, applied in the present phonological description of Modern Standard Arabic, is the 'Axiomatic Functionalist' theory, which has received its first explicit statement in Mulder's book Sets and Relations in Phonology.[1] The terms 'axiomatic' and 'functionalism' embodied in the name of this theory, indicate two of its most important features. The first feature is the use of the axiomatic-deductive method in theory building; this method makes use of an explicit set of axioms and definitions which, in principle, can be used to derive an infinite number of theorems, albeit that the theorems are not explicitly stated in the theory. The second feature is the adoption of 'function' as its 'criterion of relevance'; in this respect Axiomatic Functionalism is in line with the theories of Prague and neo-Prague. The 'functional' point of view is formulated by Martinet (1962: 5), thus: "function is the criterion of linguistic reality."[2]

In Axiomatic Functionalism, 'function' is regarded as the dominating principle which characterises the whole of the approach. The functional principle constitutes the point of view of the theory which delimits the scope of any description based on that theory. The

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(1) Mulder, J. W. F., Sets and Relations in Phonology. An Axiomatic Approach to the Description of Speech, Oxford, 1968.

(2) Mulder, J. W. F., 1979, "A Realistic view of Language and Languages," reinterprets this principle by regarding function as the criterion of linguistic relevance.

importance of this notion is shown in that Mulder (1980, d) embodies it in the first axiom of his theory, namely, "All features in semiotic set are functional," and "functional" is defined as "separately relevant to the purport of the whole of which it is a part" (Mulder 1980, d, Def. 1a)

In natural language, a functional entity is an entity which is separately relevant to the purport of communication, and as such it is relevant to the description in the sense that it can be shown to be opposed to other entities of the same type in the language. The differences between such entities automatically entail differences in the distinctive roles allocated to each of them in communication, e.g. the phonemes /d/ and /t/ in English are opposed to each other by the difference of /voiced/ and /unvoiced/.(1)

From the point of view of philosophy of science, Axiomatic Functionalism follows in broad outline the hypothetico-deductive method in the sense that the linguistic theory is deductively organized, and the description is hypothetical, i.e. the statements in the description are hypotheses about the phenomena which lie within its own scope. As the statements in the description are mere hypotheses, they, therefore, are subject to refutation by confronting them with the data. On the other hand, the statements in the theory are not hypothetical, in that they cannot be tested by confrontation with empirical facts. In this sense the theory is said to include no "existence postulates" (Hjelmslev 1969: 14).

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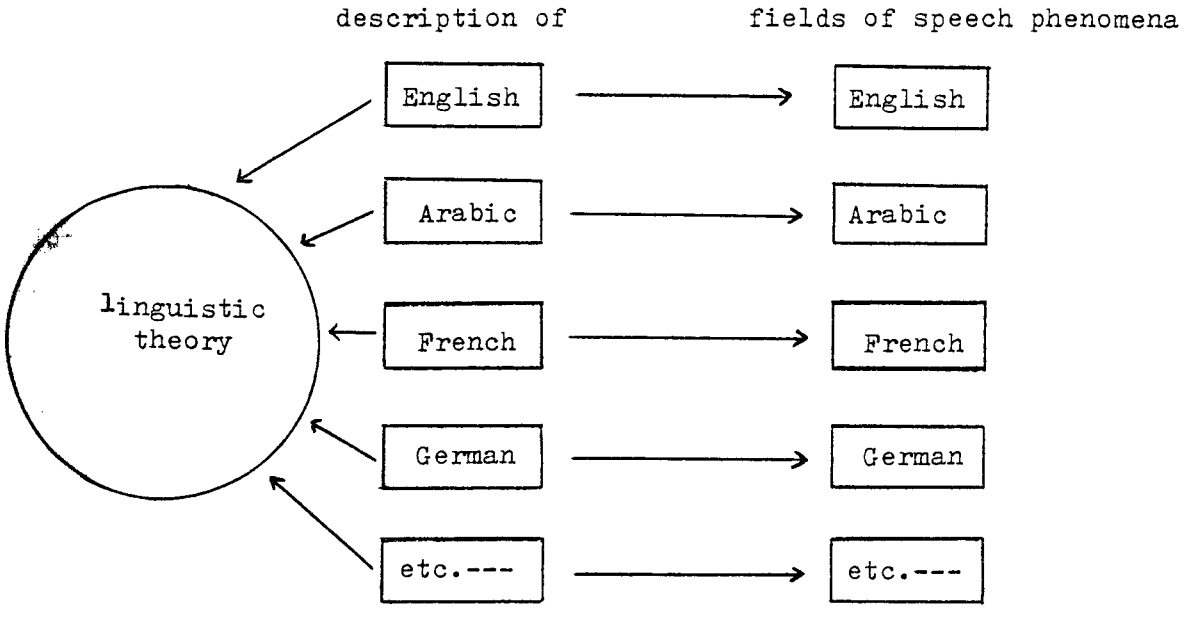
(1) Mulder, J. W. F. 'Phoneme-tables and the functional principle', La Linguistique, vol. 14, fasc. 1/1978.

According to Mulder (1980, b), the role of linguistics is to provide a linguistic theory for the description of an infinite number of parallel universes, i.e. of selected fields of speech-phenomena. The theory, as such, is logically prior to the descriptions which can be constructed in accordance with it, and a sharp distinction is, therefore, drawn between the theory, on the one hand, and the description, on the other. Such a distinction emerges from the fact that a linguistic theory should not be exclusively concerned with one universe of speech phenomena, but with an unlimited number of parallel universes, e.g. the speech phenomena of English, of Arabic, of German, etc... . The whole theory, or only sub-part of it, can be applied to each one of them separately. But, as there is one-to-many relation between the theory and the fields of phenomena, it is, therefore, absolutely necessary in linguistics not to lose sight of the intrinsic difference between theory and description under that theory (Mulder 1973). What has been previously said concerning the relationship between 'the theory', 'descriptions based on it' and 'fields of speech phenomena' may be represented by the following scheme:



(The pointed arrow ⟵ means "implies" or "presupposes")

(fig. 1)

This scheme shows that there is a direct one-to-one relation between each description and a particular field of speech-phenomena. There is a direct one-to-many relation between the linguistic theory and the descriptions resulting from the application of that theory. We also notice that there is no direct relation between the theory and any field of speech-phenomena, i.e. they are independent of one another in the sense that the theory may not have been applied or the fields of speech-phenomena may not have been described by the theory. This implies that the 'existence' of the theory is not dependent on the existence of the descriptions or speech-phenomena, and a linguistic description presupposes both the theory and a particular field of speech phenomena simultaneously. Consequently, the description is the result of the application of a particular theory to a selected field of speech-phenomena (Mulder 1968,b) .

1.1 The Structure of the Theory.

The theory contains two major types of statements which stand in a hierarchical network of relationships: 'axioms' and 'definitions', which can be used to derive 'theorems'. (1) The theory also contains two types of terms: 'Primitive' and 'defined', i.e. 'non-primitive', terms.

The 'axioms' are the basic statements or premises of the theory; they are not logically derived from any source or origin, and are logically prior to anything else in the theory. Moreover, the axioms cannot be evaluated or criticized on grounds of (empirical) truth or falsity.(2) To quote Mulder: "The initial justification for these

(1) As an axiomatic-deductively organized theory is rich in theorems, it is difficult to incorporate all the theorems that are implied by the theory in any explicit statement of the theory concerned.

(2) Suleiman, M. Y. H., "Some Remarks on the Use of 'Axioms' in Linguistic Theory", Actes of the Fifth International Colloquim of Functional Linguistics, Ioannina 1978, Sorbonne 1979.

statements is that they seem reasonable and acceptable to others, and their further justification is that they are assumed, in the absence of refutation, to be appropriate" (Mulder 1980, b).

The second type of statement is 'definition'. The main task of definitions is to define the non-primitive terms which are used in the axioms or other definitions of the theory. The process of defining terms in the theory, goes on until we are left with nothing but primitive terms.

Another task of definitions is to introduce notions of the theory. Examples of notions in Axiomatic Functionalism are "'opposition' 'commutation', 'distinctive function', 'distinctive feature', 'simultaneity', 'neutralization' and 'archiphoneme', etc..." (Ibid). Some of these notions, e.g. the notions 'distinctive feature' and 'archiphoneme' in the above set apply to entities in descriptions. In contradistinction, there are no entities to be called, for example, 'opposition' or 'distinctive function' in the description. Entities in a description "are not entities in the real world, i.e. in the realm of the speech-phenomena, but they are regarded as standing in a certain relation of isomorphism with certain classes of phenomena" (Ibid). In a description, such entities are called 'models' or 'descriptive models'. The notions that correspond to the 'models' or 'descriptive models' in the theory are called 'meta-models' or 'theoretical models'.

1.2 Linguistic Description and the Speech-Phenomena.

From the point of view of 'Axiomatic Functionalism', a structural description of any set of data can be achieved by applying a linguistic theory to it. The statements in the description are

hypotheses in the true sense of the term, because they can be confronted with empirical facts to test their adequacy and appropriateness. They can be refuted if the data provide counter-evidence to what the hypotheses assert about them, but they are upheld in the case of no counter-evidence being provided by the data in question.

As is mentioned in (1.1), the description also contains models, which are entities that stand in a relation of isomorphism with certain classes of phenomena. These 'models' are linked with the 'meta-models' by a many-to-one relation of isomorphism. An example of 'descriptive models' is the phoneme /p/ in English. The 'meta-model', i.e. the theoretical model, which corresponds to the descriptive model in question is the notion 'phoneme'.

Besides hypotheses and models, a description also contains 'labels', which are - as everything in a description - language specific, i.e. they have to be established for each language separately. Examples of labels are "vowel", "object", "adjective", "verb", which are not contained in the theory but may be found in a given description. The choice of such labels is arbitrary, but they are "included in a description for reasons of convenience" (Ibid). That is to say, they are used or incorporated to administer, organise and simplify the description.

1.3 Criteria for Evaluating the Linguistic Description and Theory.

The first criterion in evaluating the description is consistency. As a description is dependent on a particular theory and a selected field of phenomena, then, every statement in the description must be justified by the theory; if it is not, the description is then, said to be, arbitrary, i.e. to contain arbitrary statements. This may be

referred to as the consistency of the description with respect to the theory it presupposes. At the same time, every statement in the description must be consistent with other statements in the same description; this may be called the requirement of the 'internal' consistency of the description within itself. If two statements are justified by the same theory but contradict each other, then they are regarded as "scientifically meaningless" in terms of the description.

The second criterion for evaluating linguistic description in axiomatic functionalism is adequacy. According to this criterion the description must account for all the relevant features of the selected field of speech-phenomena described. The description must ensure a full and detailed coverage of the investigated data. If it can be demonstrated that the description does not account for all the data that lie within its own scope, then the description will be considered inadequate. An adequate description must not only account for all the data within its chosen field, but also account for all other relevant data, both actual and potential, because "linguistic description is, by its very nature, both descriptive and generative" (Mulder 1980, b). In addition to the above, a descriptive statement must be materially adequate, i.e. it must be consistent with the data as observed.(1) Inadequacy in this respect amounts to a refutation of the descriptive statement in question. That is, every descriptive statement ultimately stands or falls with its being materially adequate (Mulder 1980, a).

The third criterion for evaluating linguistic descriptions is simplicity. Simplicity in the description can be maintained by not having any redundant elements in the description, and by avoiding, as much as possible, any complexities in the statements as well as reducing

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(1) In other words, it must fit the facts.

the number of statements to the minimum to make the task of evaluating the consistency and adequacy of the description easy to undertake. The statement that a given linguistic description is consistent, adequate and simple is a hypothesis in the established sense of the term. It can be shown to be false by producing evidence which bears negatively on the criteria discussed so far.

A linguistic theory, to be a good and scientifically sound theory, must be consistent, adequate and simple.(1) To be consistent, the theory must not contain mutually contradictory statements, nor should such statements be derivable from it. Though statements of the theory are arbitrary in the Hjelmslevean sense (Hjelmslev 1969), they must be appropriate. According to Axiomatic Functionalism's point of view, one is not entirely free in setting up his theory, or in selecting a statement for the theory, because there are limitations which should be regarded as the framework within which the theory is set up. These limitations are considerations of the appropriateness of the theory. The selection of the first statement is controlled by consideration of appropriateness. All other statements that follow must be consistent with the first one and with each other (Mulder 1980, b).

To be adequate, the theory must fulfil its purpose, i.e. it must be capable of rendering an unlimited number of good linguistic descriptions, that are consistent, adequate and simple for a variety of accessible fields of phenomena.

Besides consistency and adequacy, a linguistic theory should be simple. Simplicity in the theory can be maintained by not having any redundant elements in it. Moreover, the number and complexity of

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(1) These criteria should not be confused with the criteria of consistency, adequacy, and simplicity as applied to the description. This is clearly illustrated in fig. (2).

statements it contains should be reduced as much as satisfying the conditions of consistency and adequacy allows. However, because there is a one-to-many relation between the theory and the descriptions that could be based on it, it would be reasonable to sacrifice some simplicity in the theory in order to have more simplicity in the descriptions.(1) The following scheme sums up the points that have been mentioned in this section (Mulder 1980, a):

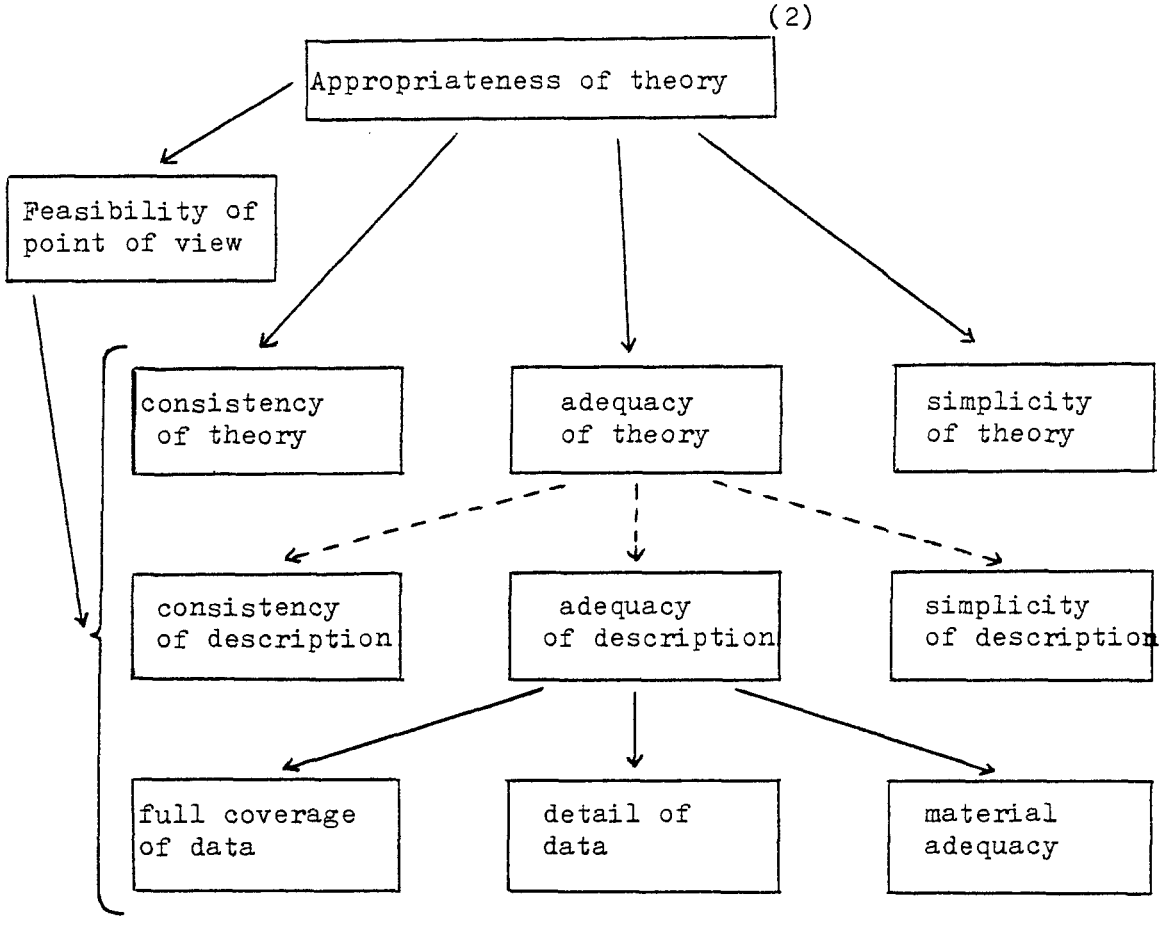

fig. (2)

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(1) For a full discussion of these and other points see (Mulder 1980, a and b).

(2) For a full discussion of "appropriateness" and of "feasibility of point of view" which I have not directly discussed in this thesis, the reader may refer to Mulder 1980, a.

CHAPTER II.

'Language': An Axiomatic Functionalist point of view.

As a semiotic theory, 'Axiomatic Functionalism' considers 'language' as a type of semiotic system, i.e. as a particular kind of system of conventions for communication (Mulder 1968, b).

According to Axiomatic Functionalism, semiotic systems fall into two major categories with respect to the potential of analysing entities which belong to them into two or more entities: simple and complex systems. Simple semiotic system is defined as a "system without combinations of [its] elements" (Mulder 1980, d, Def. 4a). Examples of this system are "human gestures" and "animal cries" (Mulder and Hervey 1972). Complex system is defined as a "system with combinations of [its] elements" (Mulder 1980, d, Def. 4b). This system is further classified into unordered or ordered systems. An unordered system is defined as a "complex system without ordering relations[1] between [its] elements", e.g. "bee dance" and "traffic signs" (Ibid, Def. $4b^1$). Ordered complex system is defined as a "complex system with ordering relations between [its] elements" (Ibid, Def. $4b^2$). This system may only have a cenological[2] articulation, such as Morse Code, or plerological[3] articulation such as number writing, or both cenological and plerological articulation, such as human natural language.

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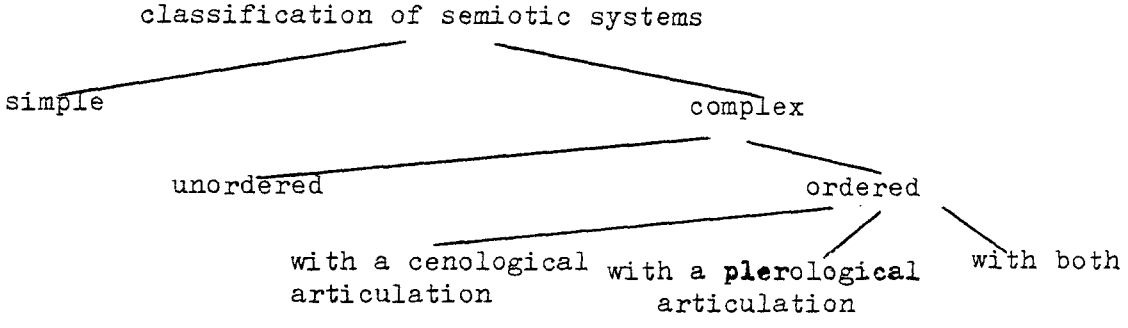
(1) "Ordering relations" for "asymmetrical relation between entities in combinations" (Mulder 1980, d, Def. 6a).

(2) "Cenology" for "complex system of figurea" (Mulder 1980, d, Def. $2b^{1e}$). "Figurea" for "semiotic entity which has only form" (Ibid, Def. 2b). In natural language 'cenology' is referred to as 'phonology'.

(3) "Plerology" for "complex system of signa" (Ibid, Def. $2a^{3e}$). In natural language 'plerology' is referred to as 'grammar'.

The classification of semiotic systems outlined above may be represented by the following scheme (Mulder and Hervey 1980, f):



Mulder defines natural language as a "semiotic system with a double articulation."(1) "Articulation" is defined as a "set of ordering relations between constituents in combination" (Mulder 1968,b : 11; also Mulder 1980, d, Def. 3b). The term 'ordering' which is related to the notion "articulation" implies that the relation between the constituent elements of a complex entity cannot be termed an 'articulation' unless the complex in question is analysed into functionally ordered constituents, i.e. asymmetrically organized constituents. "Ordering" in Axiomatic Functionalism is completely opposed to "simultaneity."(2) By "double articulation" Mulder means the 'grammatical' articulation, or syntax which is the articulation into ordered elements with both form and meaning, and the 'phonological' articulation, or phonotactics which means the articulation into ordered elements with form alone. The ultimate atomic units of the 'grammatical' articulation, generally called the 'first' articulation, are the "pleremes" (words),(3) and the ultimate

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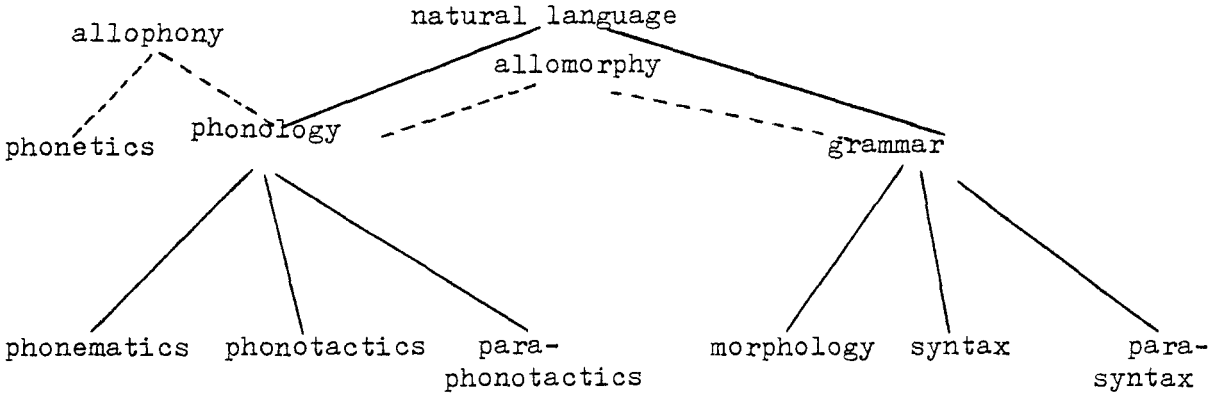
(1) "Semiotic system" for "system of convention for communication" (Ibid, Def. 1c).

(2) "Relations of simultaneity" for "symmetrical relations between entities in combinations" (Ibid, Def. 6b). I shall deal with this notion in the following chapter.

(3) "Pleremes" for "word or grammateme" (Mulder 1980, d, Def. 8b; see also Def. 8b[1]).

atomic units of the 'phonological' articulation, generally called the 'second' articulation, are the "phonemes" (Mulder 1969).

According to Axiomatic Functionalism natural language differs from other types of semiotic systems in that it has a fully-fledged phonology with a phonematics, a phonotactics and a para-phonotactics, and a fully-fledged grammar with a morphology, a syntax and a para-syntax.(1) These sub-systems are circumscribed under 'systemology'; "strongly connected with these are the areas of phonetics, allophony and allomorphy" (Mulder 1980, a). Allophony and allomorphy deal with the realisational aspect of phonology and grammar, respectively. Natural language may be schemetized as:



As it is usually acknowledged, phonetics(2) studies speech sounds not from the point of view of the 'functional' role they fulfil in communication, but from the point of view of their articulatory, acoustic and auditory properties. It, therefore, does not qualify as being central to the theory. It is linked to linguistics proper via the sign theory by the concept of "allophony".(3)

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(1) Mulder refers to this as a 'proper language'.

(2) A distinction must be drawn between systems and disciplines; here I am referring to the discipline of phonetics.

(3) For more details, see (Mulder 1980, e).

In natural human language one finds, on both the phonological and the grammatical levels, simple as well as complex (ordered and unordered) elements. Grammar and phonology, which belong to different ontological levels, must be kept strictly separated. The relation between the grammatical and the phonological planes is established via allomorphy.(1)

In phonology, phonematics is identified as an unordered complex system whose basic elements are the distinctive features which$^{may}_{\wedge}$combine with each other simultaneously to form phonemes in a language. In phonotactics (identified as an ordered complex system) the phonemes combine into larger ordered complexes, i.e. phonotagms.(2)

In grammar, morphology is identified as an unordered complex system whose basic elements are the monemes.(3) Monemes$^{may}_{\wedge}$combine with each other to form pleremes. Pleremes are simultaneous bundles of one or more monemes. Syntax is an ordered complex system whose basic elements are the pleremes. They are the minimum syntagmatic entities (Mulder 1980, f). Pleremes$^{may}_{\wedge}$combine into ordered syntactic complexes, syntagms.(4) The two sub-systems of morphology and syntax interlock in the sense that morphology provides syntax with its basic elements, i.e. pleremes. The interlock between these two sub-systems may be diagrammatically represented in the following manner:(5)

	morphology	syntax
atomic	moneme	plereme
molecular	plereme	syntagm

(1) For more details see (Mulder 1980, e).

(2) "Phonotagm" for "self-contained bundle of positions in phonology" (Mulder 1980, d, Def. 9a).

(3) "Moneme" for "minimum morphological (plerematic) entity." This implies "minimum grammatical entity" (Ibid, Def. 8b^{3}; see also Def.8a^{3}).

(4) "Syntagm" for "self-contained bundle of positions in grammar" (Ibid, Def. 9b).

(5) The interlock of phonematics and phonotactice will be dealt with in the next chapter.

The parallelism between phonology and grammar can be expressed in this manner: the monemes in grammar are analogous to the distinctive features in phonology, while the pleremes are on a par with the phonemes and the syntagms are on a par with the phonotagms. There is also an interlock between phonology and grammar in the sense that the former provides the phonological forms for the entities of the latter.

Natural language embodies a para-phonotactic and a para-syntactic sub-system.(1) The tactic entities of phonotactics and syntax are accompanied by Para-tactic features. From the functional point of view, these para-tactic features are grouped or lumped together under the term 'prosody.'(2) Para-tactic features are either contrastive or distinctive features.

In phonology the contrastive para-tactic features are defined as "features with the sole function of groupment over and above cenotactic groupment."(3) An example of such features is "accent." On the other hand, distinctive para-tactic features in natural language are defined as "para-cenotactic features that are in a relation of commutation(4) with one or more other para-cenotactic features or with 'zero' ". A typical example in natural language is "tone", as for instance in Chinese (Mulder 1980, d, Def. 17b), or in Yulu (a language spoken in the south of Sudan).(5)

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(1) Since it does not fall within the scope of my thesis, this will be a brief explanation of para-tactic sub-systems in both phonology and grammar.

(2) See (Mulder 1980, d, Def. 16). Para-tactic features imply (para-phonotactic) and (para-syntactic) features.

(3) See "Mulder 1980, d, Def. 17a." "Phonotactic" for "cenotactics in natural language." See Def. $3a^2$ and $2b^{1c}$.

(4) "Commutation" for "alternation between entities (or "zero" and semiotic entities) in functional opposition as immediate constituents, in a given context." (Ibid, Def. $7a^2$)

(5) See Gabjanda, J. D. 1976.

In syntax, the contrastive para-tactic features in natural language are defined as "features with the sole function of groupment over and above syntactic groupment" (Mulder 1980, d, Def. 18a). Examples of contrastive para-tactic features are cases of "suspensive" clause intonation. Distinctive para-syntactic features in natural language , on the other hand, are defined as "para-syntactic features (of a pleremetic nature, i.e. involving both form and information-value) that are in relation of commutation with one or more other para-syntactic features" (Mulder 1980, d, Def. 18b). An example in natural language is "sentence intonation." Even though, para-tactic elements are superimposed over and above the tactic elements, it is the para-tactic sub-systems which distinguish spoken natural languages from all other semiotic systems which manifest a four tier structure, e.g. written Arabic(1) and written Korean.

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(1) See El-Shakfeh, F. 1978.

CHAPTER III.

Phonology in Axiomatic Functionalism.

In the preceding chapter, I have mentioned that natural language is constituted of both a fully-fledged phonological and grammatical system. In this chapter I shall give a brief explanation of phonematics and phonotactics and, then, proceed to introduce some of the main notions of these phonological sub-components of the theory which I shall utilise in the ensuing description of aspects of the phonology of Modern Standard Arabic.

3.1 Phonematics and Phonotactics.

As pointed out in chapter II, phonology is divided into phonematics, phonotactics and para-phonotactics. This section is mainly concerned with phonematics and phonotactics.(1)

Phonematics deals with the decomposition of phonemes into distinctive features. A phoneme is defined as "a simultaneous bundle of distinctive features." (Mulder 1968, b). With respect to analysability, phonemes are of two types: simple phonemes which are simultaneous bundles of one, and only one, distinctive feature, for example the phoneme /r/ in Arabic which is a simultaneous bundle of one distinctive feature /r-ness/, and the phoneme /l/ in English which is analysable into the distinctive feature /l-ness/. The other type is composite

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(1) I have refrained from explaining the para-phonotactics sub-system, simply because such a discussion falls outside the scope of this thesis. For para-phonotactics see Mulder's Sets and Relations in Phonology, 1968; and Mulder and Hervey The Strategy of Linguistics, 1980, d and J.

phonemes which are analysable into two or more distinctive features, for example, the phoneme /b/ in English which is a simultaneous bundle of the distinctive features /voiced/, /labial/ and /occlusive/. As phonematics deals with simultaneous, i.e. unordered, constructions,(1) it is not possible to make functional arrangements of these distinctive features in a way that results in a bundle other than the phoneme /b/.

Phonotactics, on the other hand, deals with the analysis of self-contained phonotagms into phonemes. In phonotactics, we exclusively deal with tactic, i.e. ordered, constructions. A construction is ordered if the nature of the arrangements of its constituents is, in itself, separately relevant to communicative potential, i.e. functional. This can be demonstrated by permutation of the elements, e.g. /pat/, /tap/, /apt/.

The two sub-systems of phonematics and phonotactics interlock in the sense that phonematics provides phonotactics with the minimal phonotactic entities, the phonemes. The interlock between these two sub-systems may be diagrammatically represented in the following manner:

	phonematics	phonotactics
atomic	distinctive features	phonemes
molecular	phonemes	phonotagms

interlock

(1) A construction is simultaneous if the way in which its constituents are arranged is <u>not</u>, in itself, separately relevant to communicative potential.

The distinction between phonematics and phonotactics is based on the different types of relation which they operate with. Phonematics is characterised by relations of simultaneity while phonotactics by ordering relations.

From the foregoing paragraphs, it will have been noted that the distinction between phonematics and phonotactics is based on the distinction simultaneity versus ordering relations which characterise these two sub-systems, respectively. It will also have been noted that phonematics deals with the paradigmatic(1) aspect of language, whereas phonotactics deals with the syntagmatic(2) aspect which is consistent with the Axiomatic Functionalist theory that "language has a syntagmatic and a paradigmatic aspect." (Mulder 1968,b).

3.2 Some Relevant Notions.

3.2.1 Phoneme.

As has been pointed out in (3.1) the phoneme is the maximum entity in phonematics, and the minimum entity in phonotactics. It follows from this that the notion 'phoneme' requires definition from the point of view of both phonematics and phonotactics. From the phonematic point of view, the phoneme is defined as "a simultaneous bundle of distinctive features in phonology" (Mulder 1968, b) and, from the phonotactic point of view the phoneme is defined as "the minimum syntagmatic element in phonology" (Ibid). To exemplify what is meant by these two

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(1) "Paradigmatic" for "the oppositional or distinctive aspect of semiotic entities" (Mulder 1980, d, Def. 7a).

(2) "Syntagmatic" for "the ordering aspect of semiotic entities" (Mulder 1980, d, Def. 7b).

equivalent definitions of the phoneme, let us, for instance, take the English phoneme /p/. From the phonematic point of view, this phoneme is further analysable into the distinctive features /unvoiced/, /labial/ and /occlusive/, standing in a relation of simultaneity with respect to each other. From a phonotactic point of view, the phoneme /p/ in the phonotagm /pin/ stands in a syntagmatic relation with respect to the other phonemes in the same phonotagm; this can be demonstrated by reversing the order of the phonemes in question /nip/ which is functionally different from /pin/. In a particular phonotagm, a phoneme standing in a position should necessarily have direct or indirect relation to the other phonemes of the phonotagm in question. The order of phonemes according to the positions which they occupy in phonotagms is separately relevant to communication; it is not to be considered as linear or sequential ordering in the literal sense but as an abstract feature of the phonemes in phonotagms established in terms of criteria of functional asymmetry.(1)

In Axiomatic Functionalism the phoneme is considered as an abstract entity(2) in the sense that it is not constituted of physical sound, nor of the psychological equivalent of physical sound, nor is it a fictional entity. Axiomatic Functionalism gives the phoneme a sense of ostensibility by establishing a certain relation between the phoneme and its correlates in the phonetic data. The phoneme is indirectly linked to phonetic substance via its allophones(3), and every allophone has an infinite number of unrepeatable realizations.

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(1) By Axiom A, only functional criteria can be brought to bear in deciding whether a relation is symmetrical or asymmetrical. See Def. 6a and 6b (Mulder 1980, d)

(2) For other views of the phoneme, namely the physical, the psychological, and the fictional, the reader may refer to Twadell's article (1935) "On defining the phoneme" in Joos, Readings in Linguistics I, edited by M. Joos.

(3) "Allophone" or "phone" for "a particular phonetic form f, in its capacity of having a particular distinctive function d" in phonology, (Mulder 1980, d, Def. 23a).

In functional linguistics, the identity of linguistic entities depends on their capacity of being opposed to other entities of the same type in language. This is established by commuting each element in at least one context, with some other element of the same type or with zero, i.e. its own absence. For example, the identity of the English phoneme /p/ is established by opposing it to the phoneme /b/ as in /pit/ versus /bit/ or to the phoneme /s/ as in /pit/ versus /sit/, or to zero as in /pit/ versus /øit/ etc...

3.2.2 Distinctive Feature.

'Distinctive feature' is defined as the "minimum phonematic entity" (Mulder 1980, d, Def. 8a[3]) and is, therefore, the minimal and ultimate phonological entity. Distinctive features stand in symmetrical relations to each other in phonemes, e.g. the phoneme /s/ in English has the features /unvoiced/ and /hissing/ (Mulder 1980, h), standing in a relation of simultaneity with respect to each other.

To establish whether a particular distinctive feature of a given composite[(1)] phoneme is distinctive or not, we must be able to show that the feature in question is separately relevant to the phoneme concerned. We must also show that the feature concerned recurs in at least one other phoneme in the same language. To test this requirement we separately commute each feature in a composite phoneme with at least one other feature while holding the context constant. For example, the feature /unvoiced/ is a distinctive feature of the phoneme /s/ in English because it solely distinguishes it from /z/; similarly, the feature /hissing/ is

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(1) By composite phoneme is meant any phoneme which is constituted by two or more distinctive features.

a distinctive feature of /s/ because it solely distinguishes it from /$\overset{v}{s}$/. The same test must be applied to every distinctive feature of each composite phoneme in the language.

Testing the correctness of distinctive feature analysis in a particular language, i.e. checking whether the conditions set out at the beginning of the previous paragraph are satisfied, can only be done in terms of the entire system of interrelated composite phonemes in the language in question. The procedure adopted for carrying out this task involves the tabulation of the entire system of composite phonemes in accordance with the set of distinctive features established for the language under consideration; the distinctive features are arranged as the headings of rows and columns, and each composite phoneme is entered in the appropriate box, representing the intersection of a particular row and column, according to the set of distinctive features it has. If the analysis is correct, then every column and every row in a phoneme table must have at least two phonemes. This requirement is referred to as the 'two-in-a-column - two-in-a-row requirement' in Axiomatic Functionalism. The following table of the 'hissing' and 'hushing' phonemes in English illustrates the main points raised so far (Mulder 1980, h).

	voiced	unvoiced
hissing	z	s
hushing	$\overset{v}{z}$	$\overset{v}{s}$

From this table, it is obvious that the feature /hissing/ is a distinctive feature of /z/ and /s/ because it is the sole feature which distinguishes each one of them from /$\overset{v}{z}$/ and /$\overset{v}{s}$/, respectively. The feature /voiced/ is a distinctive feature of /z/ and /$\overset{v}{z}$/ because it is the sole feature distinguishing them from /s/ and /$\overset{v}{s}$/, respectively. The same also holds true for /hushing/ and /unvoiced/. Clearly, each of the features included in the above table satisfies the conditions mentioned above, and the requirement of 'two-in-a-column - two-in-a-row' is also fulfilled.

In the case of simple[1] phonemes in a language, the only possible commutation in terms of distinctive features is between the one and only distinctive feature of each such phoneme and its absence. Such phonemes do not enter into any correlation[2] (proportion) with other phonemes in the language and, therefore, are not tabulated. In contradistinction, composite phonemes, by virtue of the fact that they enter into correlation with each other in the phonological system of the language, are tabulated into one or more tables.

3.2.3 Neutralisation and Archiphoneme.

The notions of 'neutralisation' and 'archiphoneme' are relevant to the paradigmatic aspect of phonology in Axiomatic Functionalism. 'Neutralisation' refers to the suspension of the distinctive opposition between two or more phonemes in a specific and constant context or contexts. Mulder (1968, b: 114) defines an archiphoneme as "a

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(1) A simple phoneme is any phoneme constituted by a single distinctive feature, e.g. the phoneme /l/ in English is constituted by the single feature /l-ness/ in English. Such a phoneme is often referred to as "unclassified".

(2) For 'correlation' the reader may refer to Martinet (1964) p.66.

phoneme in a sub-system, which, when projected into the overall system, is represented there by two or more phonemes." Thus an archiphoneme is a phoneme resulting from the regular suspension (neutralisation) of the opposition between two or more phonemes that have a particular set of distinctive features in common. There are three pre-requisites for the establishment of an archiphoneme: 1) the neutralisation of opposition must be between phonemes that have a set of one or more distinctive features in common, and must involve suspension of the distinctive features which distinguish the phonemes from each other; 2) the phonemes partaking in a neutralisation must be opposed to each other in at least one context in a language; and 3) the context in which neutralisation takes place must be regular, i.e. constant (Mulder 1968, b). In English, for example, an archiphoneme /S/(1) resulting from the neutralisation of the opposition /unvoiced/~/voiced/ between the phonemes /s/ and /z/ is established in the post implosive position(2)

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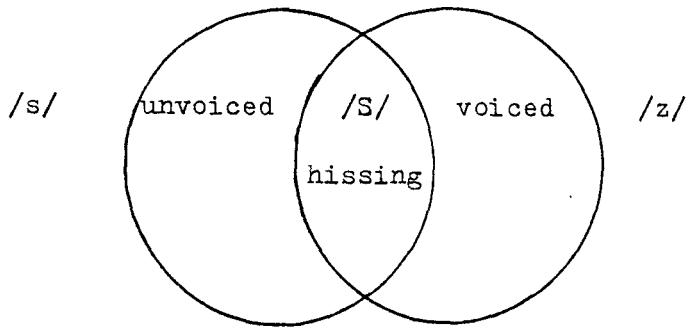
(1) An archiphoneme is conventionally written with capital letter.

(2) Concerning the distributional unit in English, the maximum extension of such unit is eight positions, namely, pre-explosive (pre-e), 1st explosive (e^1), 2nd explosive (e^2), nuclear (n), 1st implosive (i^1), 2nd implosive (i^2), 3rd implosive (i^3) and post-implosive (post-i) (Mulder and Hurren, 1968). An instance of this unit where all the positions are filled is the phonotagm /sKraNblz/ (scrambles). The elements of this phonotagm are accommodated in these positions as follows:

pre-e	e^1	e^2	n	i^1	i^2	i^3	post-i
s	K	r	a	N	b	l	z

The notions 'position' and 'distributional unit' will be dealt with in the next two sections.

if and only if the 3rd implosive position is filled by an element belonging to any of the following correlations, b/p, v/f, ð/e, and g/k, e.g. (bugs) [bʌgz] /brgS/ and (bucks) [bʌks] /brkS/. The archiphoneme /S/ has the distinctive feature /hissing/, which is the logical product of the distinctive features of /s/ and /z/.



3.2.4 Position.

One of the main notions in phonotactics is the notion 'position.' It is defined as "a place in which a syntagmatic element can stand and is substitutable for a similar element or for zero. One can regard it as a paradigmatic point on the syntagmatic axis" (Mulder and Hurren 1968: 44). So, 'position' is a place within a chain that can be occupied by an orderable element. Elements that can occur at the same place within a chain are said to commute with one another in that position .

Mulder (1968, p. 26) recognizes two types of positions: The nuclear and peripheral positions. The nucleus, i.e. the element filling the nuclear position in a particular phonotagm, is the identity element of the phonotagm concerned and, therefore, cannot be replaced by zero.

In contradistinction elements standing in peripheral positions may be replaced by zero and, in such instances, they are called 'expansions'. Mulder recognizes two types of peripheral positions: explosive, or pre-nuclear, and implosive, or post nuclear positions within which further sub-positions, depending on their 'distance', as it were, from the nucleus can be established to satisfy conditions of 'descriptive' adequacy in dealing with a language. Such positions may be labelled pre-explosive , 1st explosive, etc... and 1st implosive, etc.... In addition to this, he points out that vowels and consonants can only stand in nuclear and peripheral positions, respectively. Semi-vowels can stand in both nuclear[1] and peripheral positions.

Phonemes filling peripheral positions are functionally, and in terms of their occurence, dependent on the nucleus. In the phonotagm /fat/ in English, the phonemes /f/, /a/ and /t/ fill the explosive, nuclear, and implosive positions, respectively. The phonemes /f/ and /t/, being peripheral in the phonotagm concerned, are, in terms of their function and occurrence, dependent on the nucleus /a/.

3.2.5 Distributional Unit.

Mulder defines 'distributional Unit' as "self-contained bundle of positions in phonology" (Mulder 1980, d, Def. 9a). This notion enables the phonologist to give an adequate and straightforward description of the distribution of the phonemes in a language. The distributional unit in phonology is the largest unit one has to consider for the establishment and distribution of the phonemes in a language (Mulder and Hurren 1968). The maximum extension of such a unit in any given

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(1) Only in the absence of vowels.

phonotactic system can only be established with regard to the optimum size of its phonotagms which is treated as a model in terms of which all further phonotagms can be described. To identify a distributional unit for a language, we must specify the nuclear position for that distributional unit together with all the peripheral, explosive and implosive positions that are dependent on it, with their degree of peripherality from the nucleus. By definition, the minimum extension of a distributional unit consists of two positions, namely, a nuclear and a peripheral position, e.g. /at/ in English.

3.2.6 Archiposition.

'Archiposition' is a position which results from the suspension of distinction (contrast) between two or more adjacent (but only adjacent) positions in the maximum distributional unit. The positions between which the distinction is suspended must, of course, be established as distinct positions in their own right in the language in question. The context in which the suspension takes place must be specified, e.g. in the case of the phonotagm /snou/ (snow) in English, the phoneme /n/ stands in an archiposition resulting from the suspension of distinction between the first explosive and the second explosive positions. This distinction is suspended because the occurrence of the phoneme /n/ in this particular position precludes the occurrence of other phonemes in either of the first or the second explosive position. That is to say, no phoneme can occur either between /s/ and /n/ or between /n/ and /o/. This fact can be illustrated in the following manner:

pre-e	∃	n	i^1	i^2	i^3	post-i	('∃' representing suspension between e^1 and e^2)
s	n	o	u	∅	∅	∅	

PART TWO

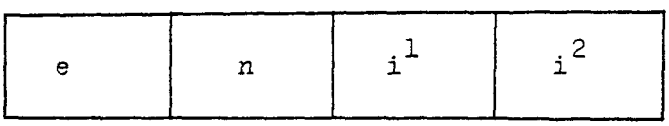
CHAPTER IV

The Distributional Unit(s) of Modern Standard Arabic.

As pointed out in (3.2.5), in phonotactics, the phonemes combine in ordering relations to form the phonotagms of the phonological system. This implies that phonotactics accounts for the distribution of phonemes and their combinations into self-contained phonotagms.

A distributional unit is defined as "a self-contained bundle of positions in phonology" (Mulder 1980, d, Def. 9a), and it is the largest unit one has to consider for the establishment and distribution of the phonemes of a language (Mulder and Hurren 1968).

In Modern Standard Arabic a distributional unit of four positions can be established as the maximal one in the language. This unit, as we shall see, is sufficient for giving a consistent and adequate description of the distribution of the phonemes. In terms of sequential order, the four positions are: explosive position (e), nuclear position (n), first implosive (i^1) and second implosive (i^2). This four-position distributional unit can be diagrammatically illustrated as:



(fig. 1)

It is noticed that there is only one pre-nuclear position and two post nuclear ones. This distributional unit represents the maximum extension of Modern Standard Arabic phonotagm, e.g. the phonotagm /zAur/ (throat).

	e	n	i^1	i^2
/zAur/ (throat)	z	A	u	r
/z̄ār/ (he visited)	z	ā	ø	r
/rai/ (irrigation)	r	a	i	ø
/lā/ (not)	l	ā	ø	ø
/ual̤/ (an indirectly attested form)(1)	u	a	l̤	

(fig. 2)

The elements which occupy the explosive position commute with each other but they do not commute with zero because they are bound elements. Mulder defines a bound element as "peripheral immediate constituent that does not commute with zero" (Mulder 1980, d, Def. 13d). Modern Standard Arabic does not tolerate the occurrence of a phonotagm in which the explosive position is not filled.

In terms of our four position distributional unit, we can establish only one archiposition resulting from the suspension of contrastive function between pos. 'i^1' and pos. 'i^2'. This archiposition will be labelled as 'I'. Thus 'I' covers these two positions, and unequivocally represents each one of them. An instance for this case is the phoneme /l̤/ which can never be assigned non-arbitrarily to either of 'i^1' or 'i^2'. Due to the improbability of the occurence of any other element between /after the /l̤/ and the nucleas, we establish an archiposition with the phoneme /l̤/ as the only occupant. In this case, the position class(2)

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(1) See S.G.J. Hervey's "On the Extrapolation of Phonological Forms" in Lingua 45 (1978), pp. 37-63.

(2) "Position class" for "A set of items which can occur in the same position or archiposition" (Mulder 1968, b: 118).

under consideration contains only one element, i.e. /l̇/. The intersection of these two positions can be diagrammatically illustrated as follows:

e	n	i^1	i^2
e	n	I	
u	a	l̇	

(fig. 3)

CHAPTER V.

The Consonant Phonemes of Modern Standard Arabic.

This chapter contains two sections: the first section deals with the setting up of the consonant phoneme-tables[1] of Modern Standard Arabic from the point of view of Axiomatic Functionalism and, the second section deals with the establishment of the identity of each phoneme, its distinctive function and its main types of realisation in the language concerned.

5.1 The consonant phoneme-tables.

The guiding principle in carrying out the above tasks is the functional principle, according to which only features which are "separately relevant to the purport of the whole of which [they are] a part" (Mulder 1980, d, Def. 1a) are regarded as functional entities in languages. In its capacity of being a functional entity, each phoneme in a language partakes in a set of oppositions which establish its identity. Furthermore, each phoneme is a simultaneous bundle of one or more distinctive features, and, of course, no two phonemes in a language can have the same set of features. It is worth stressing that the 'functional principle' plays the most important role in the establishment of phonemes. For an element to be 'functional' it should be commutable with other elements or its absence (zero). It is also important to mention that the notions 'distributional unit' and

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(1) The following tables are different from any other tables for the same data that I have come across (Nasr, 1967; Altoma, 1969; AL-Ani, 1970), this, of course, is to be expected due to the fact that a different approach is used in this thesis.

'position' provide the necessary framework for valid commutation.

On the basis of what has been said above, the following twenty-seven consonantal phonemes, together with their distinctive features, can be established for Modern Standard Arabic. It may be noted here that each one of these phonemes, except for /l̇/ which only occurs in the explosive and in an archiposition representing the suspension of the contrast between first and second implosive positions (see Chapter IV), can occur in the explosive, first or second implosive positions which, together with the nuclear position, of course, constitute the maximal extension of the distributional unit in Modern Standard Arabic as has been explained in Chapter IV.

The consonantal phonemes of Modern Standard Arabic and their distinctive features are:

/m/	(labial, nasal)	/māt/	(to die)	v. /fāt/ (to pass by
/b/	(labial, occlusive)	/bāb/	(a door)	v. /ʒāb/ (to melt)
/f/	(labial, fricative)	/fār/	(to boil)	v. /dār/ (a house)
/ḍ/	(apical, occlusive, voiced emphatic)	/ḍār/	(harmful)	v. /ṭār/ (to fly away)
/d/	(apical, occlusive, voiced, non-emphatic)	/dār/	(a house)	v. /nār/ (fire)
/ṭ/	(apical, occlusive, unvoiced emphatic)	/ṭāl/	(to be long)	v. /qāl/ (to say)
/t/	(apical, occlusive, unvoiced non-emphatic)	/tāb/	(to repent)	v. /ɣāb/ (to disapppear
/ʒ̣/	(apical, fricative, voiced, emphatic)	/ʒ̣Arf/	(an envelope)	v. /ḥArf/ (a letter)
/ʒ/	(apical, fricative, voiced non-emphatic)	/ʒāb/	(to melt)	v. /ʔāb/ (to return)

/θ/	(apical, fricative, unvoiced)	/θār/	(to rise up)	v. /fār/ (to boil)
/n/	(apical, nasal)	/nār/	(fire)	v. /ᵛžar/ (neighbour)
/ᵛz/	(hushing, occlusive)	/ᵛzār/	(neighbour)	v. /ʕār/ (shame)
/ᵛs/	(hushing, fricative)	/ᵛsāb/	(to become grey-haired)	v. /tāb/ (to repent)
/ʔ/	(glottal, occlusive)	/ʔam/	(or)	v. /dam/ (blood)
/h/	(glottal, fricative)	/hān/	(to become easy)	v. /bān/ (to appear)
/z/	(hissing, voiced)	/zār/	(to visit)	v. /dār/ (to turn)
/ṣ/	(hissing, unvoiced, emphatic)	/ṣāḥ/	(to shout)	v. /bāḥ/ (to reveal)
/s/	(hissing, unvoiced, non-emphatic)	/sār/	(to walk)	v. /fār/ (to boil)
/ʕ/	(pharyngal, voiced)	/ʕār/	(shame)	v. /nār/ (fire)
/ḥ/	(pharyngal, unvoiced)	/ḥāl/	(condition)	v. /māl/ (money)
/ɣ/	(velar, voiced)	/ɣāb/	(to disappear)	v. /tāb/ (to repent)
/x/	(velar, unvoiced)	/xāb/	(to fail)	v. /nāb/ (eyetooth)
/q/	(dorsal, emphatic)	/qāl/	(to say)	v. /bāl/ (mind)
/k/	(dorsal, non-emphatic)	/kāl/	(to measure)	v. /māl/ (money)
/l̤/	(lateral, emphatic)	/uallāh/	(by God)	v./uaqqāh/ (to protect him)
/l/	(lateral, non-emphatic)	/lan/	(will never)	v. /man/ (who?)
/r/	(r-ness)	/rāḥ/	(to go away)	v. /ṣāḥ/ (to shout)

The identity and distinctive function of the distinctive features given above are established by opposing each feature to some other feature. For example, the identity of the feature 'labial' is established by the following set of oppositions: (the same applies to the features /'apical', 'hushing', etc....)

/labial/	v.	/apical/	/b/	v.	/d/
/labial/	v.	/hushing/	/b/	v.	/$\overset{v}{z}$/
/labial/	v.	/glottal/	/b/	v.	/ʔ/
/labial/	v.	/hissing/	/b/	v.	/z/
/labial/	v.	/pharyngal/	/b/	v.	/ʕ/
/labial/	v.	/velar/	/b/	v.	/x/
/labial/	v.	/dorsal/	/b/	v.	/k/
/labial/	v.	/lateral/	/b/	v.	/l/

The identity of the feature 'occlusive' is established by the following opposition: (the same applies to the features 'fricative' and 'nasal')

/occlusive/	v.	/fricative/	/$\overset{v}{z}$/	v.	/$\overset{v}{s}$/

The identity of the feature 'emphatic' or 'non-emphatic' is established by the following opposition:

/emphatic/	v.	/non-emphatic/	/ṣ/	v.	/s/

The identity of the feature 'voiced' or 'unvoiced' is established by the following opposition:

/voiced/	v.	/unvoiced/	/d/	v.	/t/

To test the validity of our distinctive feature analysis the procedure specified in (3.2.2) is applied. This procedure involves the setting up of phoneme-tables which satisfy the two-in-a-column - two-in-a-row requirement. For this purpose, the distinctive features are arranged horizontally and vertically as the headings of rows and columns, and each phoneme of the language is placed in the appropriate box, i.e. in the box

which represents the intersection of its distinctive features. Obviously, this procedure does not apply to simple phonemes, i.e. phonemes which consist of one distinctive feature only.

It is not possible, while preserving the two-in-a-column - two-in-a-row requirement, to tabulate all the consonantal phonemes of Modern Standard Arabic in one scheme only. Three schemes are required for Modern Standard Arabic phonemes: a four dimensional, a three dimensional, and a two dimensional one. The phoneme /r/, which is a simple phoneme is left untabulated. This is in full agreement with the principles of functional linguistics. In setting up each of the tables, considerations of consistency, adequacy and simplicity are taken into account. The names for the distinctive features are mere labels, though we require them to be phonetically appropriate, i.e. to give an idea about the phonetic properties of the realisations of each phoneme. In what follows I shall give each of the tables together with a discussion of some of the points relevant to it.

	occlusive				fricative				nasal
	voiced		unvoiced		voiced		unvoiced		
	E.	N.E.	E.	N.E.	E.	N.E.	E.	N.E.	
labial	b				f				m
apical	d̤	d	t̤	t	ẓ	ẓ	θ		n
hushing	v z				v s				
glottal	ʔ				h				

(fig. 1)

This table can be said to be the major sub-scheme because it contains the largest number of the consonantal phonemes of Modern Standard Arabic, and utilizes the highest number of distinctive feature dimensions. None of the other two tables has as many phonemes as this table, nor does any one of them employ all the dimensions employed in this scheme. The four dimensions are:

1. /labial ~ apical ~ hushing ~ glottal/
2. /occlusive ~ fricative ~ nasal/
3. /voiced ~ unvoiced/
4. /emphatic ~ non-emphatic/

The fourth dimension is built on the third dimension which, in turn, is built on sections of the second dimension. The second dimension, in its turn, is built on the first dimension. This implies that features in the fourth dimension, necessarily, imply features in the third and the second dimension which, in turn, imply features in the first dimension. However, it must be pointed out that the opposition 'voiced' ~ 'unvoiced' and 'emphatic' ~ 'non-emphatic' are not functionally relevant to the nasals. The nasal phonemes of Modern Standard Arabic are, from a phonetic point of view, [voiced] and [non-emphatic]. From a functional point of view, the nasal phonemes of Modern Standard Arabic cannot be specified for the two sets of opposition/voiced ~ unvoiced/ and /emphatic ~ non-emphatic/.

The same is also true of the 'labial', 'hushing' and 'glottal' phonemes which, due to functional criteria, do not partake in the sets of opposition/voiced ~ unvoiced/ and /emphatic ~ non-emphatic/. Though,

phonetically speaking, /ʔ/ and /h/ are both [unvoiced] and [non-emphatic] they are, from a purely phonological point of view, only /glottal/, /occlusive/ and /glottal/, /fricative/, respectively. In such instances, where a given opposition is systematically 'suspended' for a set of one or more phonemes, the phonemes in question can be said to represent both terms in the opposition, or oppositions, concerned. For example, the phoneme /b/ could be said to represent the features (labial, occlusive, voiced) as much as it represents the features (labial, occlusive, unvoiced).

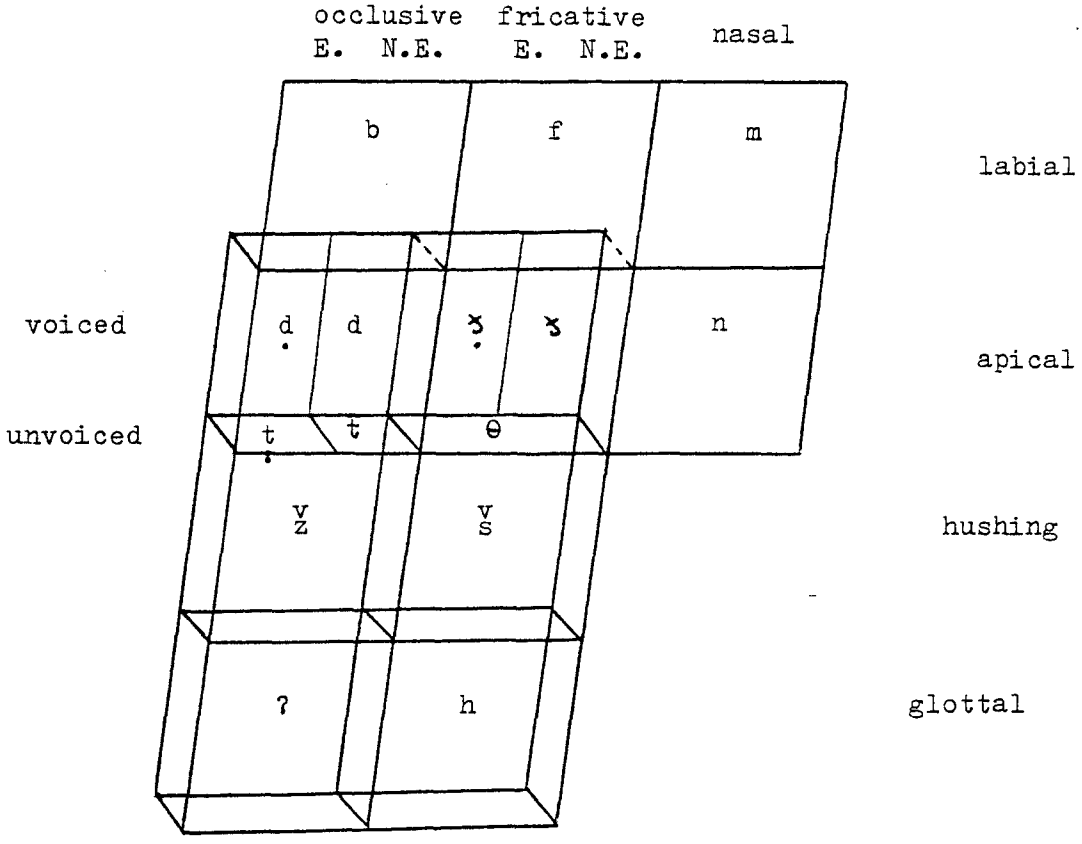
A similar situation holds for the phoneme /θ/ which, unlike the apical phonemes /d̤/: /d/, /t̤/: /t/ and /s̤/: /s/, does not partake in the opposition/emphatic ~ non-emphatic/. As has been mentioned earlier, this phoneme has the distinctive features /apical, fricative, unvoiced/. The phoneme /θ/ is, then, as much opposed to /s̤/ as it is to /s/, though, in terms of realisations, it is phonetically closer to /s/ than it is to /s̤/. Moreover, with respect to the opposition /emphatic ~ non-emphatic/, the phoneme /θ/ can be said to represent (apical, emphatic, fricative, unvoiced) as much as it represents (apical, non-emphatic, fricative, unvoiced).

The phonemes /b/, /f/, /z̬/, /s̬/, /ʔ/, /h/ and /θ/ could be regarded as 'hyperphonemes'. The notion 'hyper-phoneme' is not to be confused with the notion of archiphoneme. A hyper-phoneme shows a systemic suspension of opposition which is not triggered by a context, and does not occur in a paradigm. To explain the difference between these two notions let us consider the following examples.

As has been pointed out above, the phoneme /θ/ in Modern Standard Arabic is as much (apical, emphatic, unvoiced, fricative) as it is (apical, non-emphatic, unvoiced, fricative). Functionally speaking,

these two bundles of distinctive features are not distinct from each other and, therefore, they constitute one, and only one, phonological entity which functions as a minimum phonotactic unit in the language under consideration. The archiphoneme /D/, on the other hand, has the distinctive features (apical, occlusive, emphatic) and it represents the suspension of the opposition/voiced ~ unvoiced/ between the phonemes /d̤/and /t̤/ in contexts to be specified later in this thesis (see chapter VI). In the contexts where the opposition is suspended the archiphoneme /D/ is said to equally represent the bundles of features /apical, occlusive, emphatic, voiced) and (apical, occlusive, emphatic, unvoiced) which, elsewhere, constitute functionally distinct minimum phonotactic entities, i.e. /d̤/ and /t̤/, respectively.

To check the correctness of the application of the functional principle in the above table, the following four-dimensional table is provided.



(fig. 2)

From this scheme, it is obvious that the functional principle is satisfied.(1) Each one of the dimensions built on the terms of the dimension (labial ~ apical ~ hushing ~ glottal) is shown to have, at least, two phonemes.

The second scheme, which is complementary to the first scheme given above, is this:

	voiced		unvoiced	
	E.	N.E.	E.	N.E.
hissing	z		ṣ	s
pharyngal	ʕ		ḥ	
velar	ɣ		x	

(fig. 3)

This scheme exhibits three dimensions only; they are:

1. (hissing ~ pharyngal ~ velar)
2. (voiced ~ unvoiced)
3. (emphatic ~ non-emphatic)

This table preserves the dimensions (emphatic ~ non-emphatic) and (voiced ~ unvoiced) which are exhibited in the first table; it also preserves the same dependency relation between these two dimensions, i.e. the superimposition of (emphatic ~ non-emphatic) on (voiced ~ unvoiced). In this sense, this table is said to be connected, or to

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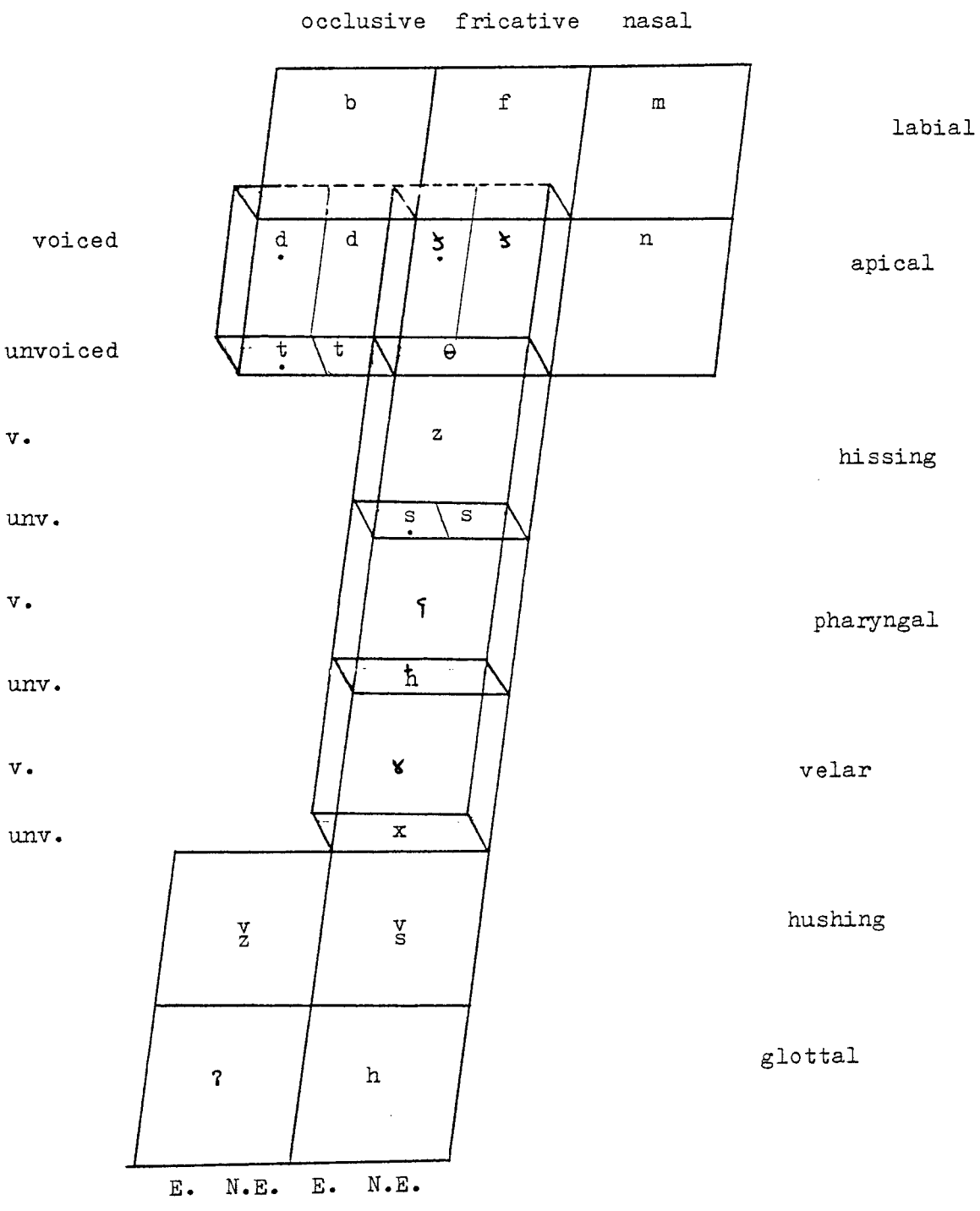
(1) For the convention of reading tables of this type, the reader may refer to Mulder (1980, h).

interlock, with the first table. The major difference between this table and the first one is the exclusion of the opposition (occlusive ~ fricative) in this table and its inclusion in the previous one as part of the dimension (occlusive ~ fricative ~ nasal).

From a phonetic point of view, i.e. in terms of realisation, the phonemes in the second table are all [fricative]. From the point of view of phonology, however, this feature is not functional, i.e. redundant because there are no 'hissing', 'pharyngal', or 'velar' phonemes in Modern Standard Arabic which are occlusive. In other words, because of the lack of an 'occlusive': 'fricative' correlation for the phonemes classified in the table under consideration, the feature [fricative] which, from a phonetic point of view, characterises these phonemes cannot be established as a functionally relevant feature. This is the main reason for not classifying the phonemes in this table with the phonemes in the first table. If we were to include these phonemes in the first table, then the two-in-a-column - two-in-a-row requirement would be violated, i.e. the table would not satisfy the condition of external consistency between the description and the theory which it presupposes. To show this, I shall incorporate the present table in the four dimensional table (fig. 2) used for checking the correctness of the application of the functional principle in the first table (fig. 1). This yields the following representation:



(fig. 4)

This scheme shows that the opposition (occlusive ~ fricative) is not applicable for the 'hissing', 'pharyngal' and 'velar'phonemes. This

means that the inclusion of these phonemes in the main table (fig. 1) would violate the functional principle expressed in terms of the two-in-a-column - two-in-a-row requirement. Moreover, (fig. 4), shows that the 'hissing', 'pharyngal' and 'velar' phonemes constitute a system in their own right. These factors underlie our decision not to include the phonemes under consideration in the main table (fig. 1).

The decision to include the phonemes /$\overset{v}{z}$/ and /$\overset{v}{s}$/ in the table shown by (fig. 1), rather than in the table shown by (fig. 3), may seem to be an arbitrary one. In other words, it may be argued that these phonemes belong as much to the latter table as they do to the former one. One may choose to characterise the difference between these two phonemes either in terms of the opposition (occlusive $\sim$ fricative) or (voiced $\sim$ unvoiced), respectively, but not in terms of both as this will result in the violation of the functional principle and its application in setting up phoneme tables.

In solving this problem by seeking a non-arbitrary solution, considerations of different types ought to be taken into account. One consideration is the possibility of neutralisation of opposition between phonemes. If it is the case in the language under consideration that neutralisation can be established either between /$\overset{v}{z}$/ and /z/, or /$\overset{v}{s}$/ and /$\dot{s}$/or /$\overset{v}{s}$/ and /s/, then this constitutes a sufficient reason for classifying /$\overset{v}{z}$/ and /$\overset{v}{s}$/ in the same table as /z/, /$\dot{s}$/ and /s/. By classifying these phonemes in the same table we assign to them some common features, i.e. /$\overset{v}{z}$/ and /z/ would be regarded as /voiced/ and /$\overset{v}{s}$/, /$\dot{s}$/ and /s/ as /unvoiced/, which is a pre-requisite for the establishment of archiphonemes representing the systemic suspension of opposition between phonemes having one or more distinctive features in common.

This point has been investigated, but no positive results were reached, i.e. neutralisation has not been observed to operate. This consideration, in addition to the fact that the opposition (occlusive ~ fricative) is more primary than the opposition (voiced ~ unvoiced) in terms of the main table in (fig. 1) underlies our decision to tabulate /$\overset{V}{z}$/ and /$\overset{V}{s}$/ in the first scheme rather than in the second one.

There is one important problem connected with the third, and final, table presented in (fig. 5) below.

	E.	N.E.
dorsal	q	k
lateral	l̤	l

(fig. 5)

The problem concerns the classification of /q/ and /k/ as <u>dorsals</u>. But before I deal with this problem, I shall consider the 'emphatic' and 'non-emphatic' lateral phonemes /l̤/ and /l/.

One thing to be noticed about our treatment of these two phonemes is that they are not, from a phonological point of view, considered to be <u>voiced</u>, though, phonetically speaking they are so. The decision to rule out "voicing" as a feature of the laterals in Modern Standard Arabic is, again, justified by reference to the functional principle. Because there are no unvoiced laterals in Modern Standard Arabic, the phonetic feature [voiced] which characterises /l̤/ and /l/, in terms of their

realisations, cannot be established as a functional feature. In functionalist terminology the feature [voiced] is said to be a concurrent feature of the feature /lateral/ and, as such, it cannot be said to be "separately relevant to the purport of the whole of which it is a part" (Mulder, 1980, d, Def. 1a).

Another point to mention at this stage is the fact that the opposition (emphatic ~ non-emphatic) between the lateral phonemes /l̤/ and /l/ is neutralised in certain contexts. This point will be dealt with later in Chapter VI. Suffice it to say here, that, in order to account for this neutralisation, the phonemes concerned must be entered into some table in the description. In other words, for adequacy reasons these two phonemes must be tabulated, in accordance with the functional principle, somewhere in the description; this is necessary to account for the correlation that holds between them and, furthermore, for keeping them distinct from each other, the alternative being to leave them unclassified and assign to them the feature lateral. Such an alternative is not acceptable because it results in the establishment of one phoneme where two are actually involved.

For a proper discussion of the place of the phonemes /q/ and /k/ in this table we need to refer to the 'velar' phonemes /ɣ/ and /x/ classified in the second table in fig. (3). Phonetically speaking, these phonemes are realised as:

1. /ɣ/ is realised as [velar, voiced, fricative]
2. /x/ is realised as [velar, unvoiced, fricative]
3. /k/ is realised as [velar, non-emphatic, unvoiced, occlusive]
4. /q/ is realised as [uvular, emphatic, unvoiced, occlusive]

In tabulating these phonemes, three solutions have been investigated:

1) Considering the phoneme, /ɣ/, /x/ and /k/ as 'velars', and classifying them in the main table in fig. (1) and leaving /q/ unclassified.

2) Considering the phonemes /x, ɣ , k, q/ as 'dorsals', and classifying them in the main table, and

3) Considering /x/ and /ɣ/ as 'velars' and classifying them in the second scheme; and considering the phonemes /k/ and /q/ as 'dorsals' and including them with the 'lateral' phonemes /l̤/ and /l/ in the same scheme.

If the first solution was adopted, and the phonemes /k/, /ɣ/ and /x/ were included in the main scheme in fig. (1), then this scheme would look like this:

	occlusive				fricative				nasal
	voiced		unvoiced		voiced		unvoiced		
	E.	N.E.	E.	N.E.	E.	N.E.	E.	N.E.	
labial	b				f				m
apical	d̤	d	t̤	t	ʒ̤	ʃ	θ		n
hushing	v z				v s				
glottal	ʔ				h				
velar	k				ɣ		x		

(fig. 6)

Clearly, this table is in full agreement with the functional principle.

There are three phonemes in the velar dimension distributed over the (occlusive ~ fricative) dimension. The phoneme /k/ would be considered as a 'hyper-phoneme'. In other words, as far as consistency of the table with the functional principle is concerned, there is no reason why this solution should be ruled out as being inadmissible. But consistency of the description with the theory is not the only criterion to be considered in evaluating linguistic solutions. Other considerations of descriptive adequacy in relation to the data must be taken into consideration, too.

If we were to adopt this solution, then we would not be able to account for neutralisation between the phonemes /k/ and /q/ if it is found to hold in the language under consideration. If such a neutralisation exists, then the phonemes /k/ and /q/ must be shown to have at least one distinctive feature in common, or else we cannot account for this neutralisation.

As shall be pointed out in Chapter VI, such a neutralisation of opposition between /k/ and /q/ exists in Modern Standard Arabic. Consequently, in order to account for this, the phonemes /k/ and /q/ must be shown to have at least one distinctive feature in common; this means that these two phonemes must be tabulated in the same scheme and shown to have at least one feature in common therein. We may try to accommodate this by including a feature 'uvular' in the modified version of the main scheme presented in fig. (6) above, and assigning the phoneme /q/ to the intersection of this feature with the feature 'occlusive', as is shown in the scheme below:

	occlusive				fricative				nasal
	voiced		unvoiced		voiced		unvoiced		
	E.	N.E.	E.	N.E.	E.	N.E.	E.	N.E.	
labial	b				f				m
apical	d̤	d	t̤	t	ð̤	ð	θ		n
hushing	v z				v s				
glottal	ʔ				h				
velar	k				ɣ		x		
uvular	q								

(fig. 7)

This solution (fig. 7) must be immediately rejected because it does not satisfy the functional principle. There is only one phoneme in the 'uvular' dimension and, therefore, the requirement of two-in-a-column - two-in-a-row is violated.

The first solution is, clearly, not adequate. It does not permit us to account for the neutralisation of opposition between /k/ and /q/ in Modern Standard Arabic. Moreover, this hypothesis does not allow the describer to account for the correlation between /k/ and /q/, i.e. the proportionality of the relationship between these two phonemes, which is

of the same degree as the correlation between the other 'emphatic' phonemes and their 'non-emphatic' counterparts. The proportionality of the relationship between these phonemes can be expressed in this fashion:

/k/ : /q/:: /t/ : /ṭ/:: /d/ : /ḍ/:: /ʒ/ : /ʒ̣/:: /s/ : /ṣ/:: /l/: /ḷ/.

From this it seems plausible that the opposition (emphatic ~ non-emphatic) is of prime importance for the phonemes /k/ and /q/. It is actually this opposition which is suspended when neutralisation takes place between these two phonemes. Any table we eventually adopt must incorporate these features for /k/ and /q/.

The second solution requires a modification of the main scheme in fig. (1) in the following manner:

		occluaive		fricative		nasal
		voiced	unvoiced	voiced	unvoiced	
labial	E.	b		f		m
	N.E.					
apical	E.	d̤	t̤	ʒ̤	θ	n
	N.E.	d	t	ʒ		
hushing	E.	v z		v s		
	N.E.					
dorsal	E.	q		ɣ	x	
	N.E.	k				
glottal	E.	ʔ		h		
	N.E.					

(fig. 8)

(1)

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(1) If this solution is adopted, then the table in fig. (3) would need to be modified in line with this as follows:

		voiced	unvoiced
hissing	E.	z	s̤
	N.E.		s
pharyngal	E.	ʕ	ḥ
	N.E.		

This solution overcomes the two main difficulties witnessed in considering the first solution. It allows the describer to account for the neutralisation of opposition between /k/ and /q/ and preserves the proportionality in the relationship between the 'emphatic' and 'non-emphatic' phonemes. Moreover, this solution is entirely consistent with the functional principle, and is also materially adequate with respect to the data it purports to account for; in terms of their realisation, the phonemes /x, ɣ, k, q/ are 'dorsal'.

Nevertheless, there is one important short-coming in this solution. By tabulating /k/ and /q/ in the modified version of the main scheme given in fig. (8) above, the lateral phonemes, which I have tabulated in the same scheme as /k/ and /q/ in fig. (5) will be left unclassified. Such a conclusion, as has been pointed out earlier in this chapter, must be avoided if our description is to be adequate with respect to the data it purports to describe. On the one hand, by leaving the phonemes /l/ and /l̪/ unclassified, we cannot keep them distinct from each other as, presumably, the one and only feature that can be non-arbitrarily assigned to them is the feature /lateral/. It might be suggested, however, that these two phonemes can be kept distinct from each other by assigning the feature 'emphaticness' to /l̪/ and the feature 'non-emphaticness' to /l/; but such a solution would, in my opinion, be <u>ad hoc</u> as /l̪/ is no more 'emphatic' than, say, /d̪/, and /l/ is no more 'non-emphatic' than, say, /b/ or /d/. On the other hand, by leaving the phonemes /l/ and /l̪/ unclassified we cannot account for the neutralisation of opposition which takes place between them, even if we agreed to assign to them the

features 'non-emphaticness' and 'emphaticness' arbitrarily. As has been explained in (3.2.3), for neutralisation of the opposition between phonemes to take place, the phonemes in question must have at least one distinctive feature in common. Under the above solution, /l/ and /l̤/ would be each composed of one distinctive feature and, therefore, cannot have any feature in common.

To avoid the above difficulties we must, therefore, not leave the phonemes /l/ and /l̤/ unclassified. Because the second solution which I have projected for the problem of tabulating /x, ɣ, k, q/ leaves the phonemes /l/ and /l̤/ unclassified, and because there is no other way, apart from the one given in fig. (5), for tabulating the phonemes /l/ and /l̤/, the solution in question cannot be an adequate one and, therefore, must be rejected.

The third solution, which I have incorporated in my thesis[1], appears to be the optimal one. It overcomes all the problems faced by the first and second solutions, and satisfies the functional principle. Nevertheless, it might be argued that the feature /dorsal/ which partly characterises the phonemes /k/ and /q/ according to this solution, is arbitrarily assigned to them, since these two phonemes are, in terms of realisation, no more 'dorsal' than, say, /x/ or /ɣ/ or both. It is also the case that in the articulation of the 'emphatic' phoneme /q/, the main body of the tongue is curved upwards and pulled backwards to touch a point further back in the roof of the mouth than it does in the case of its 'non-emphatic' counterpart /k/. Though this is not in dispute, still it must be pointed out that the label 'dorsal' is an appropriate one. It indicates that what is significant about the phonemes /k/ and

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(1) See fig. (5) above.

/q/ is not that the former is 'velar' and the latter is 'uvular', but that both are 'dorsals'.

The table in fig. (5) interlocks with the tables in fig. (1) and (3) by virtue of the fact that they all share the (emphatic ~ non-emphatic) dimension. This dimension is built on the dimension (dorsal ~ lateral) in the table presently under consideration.

The phoneme /r/ of Modern Standard Arabic is left unclassified. It is a simultaneous bundle of only one distinctive feature which, for want of a better term, I shall call /r-ness/. From a logical point of view, the phoneme /r/ must be kept distinct from /r-ness/ which, as I have said above, constitutes its only distinctive feature.

Finally to provide a check over our analysis, a Jakobsonian-type table is set up (see page 53). The phonemes are arranged horizontally and the distinctive features vertically. If our analysis is correct, no two phonemes can have the same set of distinctive features. The following conventions are used in this table; the mark (+) indicates a positive feature of the phoneme in question, while (-) indicates its functional opposition in respect to other distinctive features. The nil mark (o) indicates a non-functional feature in respect to the phoneme, i.e. such a feature does not contribute to the distinctive function of that particular phoneme. The overall system of the consonantal phonemes of Modern Standard Arabic is tabulated on page 52.

5.2 The consonant phonemes of Modern Standard Arabic and their realisations.

This section will be concerned with establishing the identity and distinctive function of each phoneme in Modern Standard Arabic, as well

as with its main types of realisation. The following statements of realisation are guided by the points mentioned in the following quotation from Mulder and Hurren (1968: 56);

they write:

> "Statements of realization are necessary in order to make possible the activation of the phonological description, i.e. to generate new data on the basis of the description. As the variety of speech-sounds in a language is infinite, one has to make serious restrictions as to the degree of precision and detail of those statements. What is brought in or left out is to a large extent dictated by practical considerations. We list what we note impressionistically and what strikes us as conspicuous."

The overall system of the consonant phonemes.

	occlusive				fricative				nasal
	voiced		unvoiced		voiced		unvoiced		
	E.	N.E.	E.	N.E.	E.	N.E.	E.	N.E.	
labial	b				f				m
apical	ḍ	d	ṭ	t	ʒ̣	ʒ	θ		n
hushing	v z				v s				
glottal	?				h				

/r/ unclassified

	voiced		unvoiced	
	E.	N.E.	E.	N.E.
hissing	z		ṣ	s
pharyngal	ʕ		ḥ	
velar	ɣ		x	

	E.	N.E.
dorsal	q	k
lateral	ḷ	l

"The distinctive features of the consonant phonemes of M.S.A."

	b	f	m	ḍ	d	ṭ	t	ẓ	ʒ	ɵ	n	v z	v s	ʔ	h	z	ṣ	s	ʕ	ḥ	ɣ	x	ʕ	k	ḷ	l	r
labial	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	o	o	o	o	o	o	o	o	o	o	o	o
apical	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	o	o	o	o	o	o	o	o	o	o	o	o
hushing	-	-	o	-	-	-	-	-	-	-	o	+	+	-	-	o	o	o	o	o	o	o	o	o	o	o	o
glottal	-	-	o	-	-	-	-	-	-	-	o	-	-	+	+	o	o	o	o	o	o	o	o	o	o	o	o
occlusive	+	-	-	+	+	+	+	-	-	-	-	+	-	+	-	o	o	o	o	o	o	o	o	o	o	o	o
fricative	-	+	-	-	-	-	-	+	+	+	-	-	+	-	+	o	o	o	o	o	o	o	o	o	o	o	o
nasal	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	o	o	o	o	o	o	o	o	o	o	o	o
voiced	+	+	o	+	+	-	-	+	+	-	o	+	+	+	+	+	-	-	+	-	+	-	o	o	o	o	o
un-voiced	+	+	o	-	-	+	+	-	-	+	o	+	+	+	+	-	+	+	-	+	-	+	o	o	o	o	o
emphatic	+	+	o	+	-	+	-	+	-	+	o	+	+	+	+	+	-	-	+	+	+	+	+	-	+	-	o
non-emphatic	+	+	o	-	+	-	+	-	+	+	o	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	o
hissing	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	+	+	+	-	-	-	-	o	o	o	o	o
pharyngal	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	-	-	-	+	+	-	-	o	o	o	o	o
velar	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	-	-	-	-	-	+	+	o	o	o	o	o
dorsal	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	+	+	-	-	o
lateral	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	-	-	+	+	o
r-ness	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	+

(fig. 9)

The phoneme /b/.

a) This phoneme belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /f, ɵ, ɔ̣, ɣ̣, t, ṭ, d, ḍ, n, s, ṣ, z, v̱s, v̱z, x, ɣ, ḥ, ʕ, h, ʔ, k, q, l, r, l̤, m, n, i, u/

In pos. 'i^1' it commutes with /f, θ, ɔ̣, ɣ̣, t, ṭ, d, ḍ, n, s, ṣ, z, v̱s, v̱z, x, ɣ, ḥ, ʕ, h, ʔ, k, q, l, r, i, m, u, v̱š, ʒ̣, D, X, N, ø/

In pos. 'i^2' it commutes with /f, θ, ɔ̣, ɣ̣, t, ṭ, d, ḍ, n, s, ṣ, z, v̱s, v̱z, x, ɣ, ḥ, ʕ, h, ʔ, k, q, r, m, L, T, H, K, ⊖, ø/

c) The identity and distinctive function of /b/ are established by the following comparisons:

1.	b/f	/bāt/	(to pass the night)	/fāt/	(to pass by)
2.	b/m	/bāl/	(mind)	/māl/	(money)
3.	b/t	/bāb/	(a door)	/tāb/	(to repent)
4.	b/ṭ	/bāb/	(")	/ṭāb/	(to be good)
5.	b/d	/bās/	(to kiss)	/dās/	(to tread on)
6.	b/ḍ	/bāʕ/	(to sell)	/dāʕ/	(to be lost)
7.	b/θ	/bāb/	(a door)	/θāb/	(to return)
8.	b/ɣ̣	/bAhr/	(dazzlement)	/ɣ̣Ahr/	(back)
9.	b/ɣ	/bāb/	(a door)	/ɣāb/	(to melt)
10.	b/n	/bāb/	(")	/nāb/	(eye tooth)
11.	b/v̱z	/bāʕ/	(to sell)	/v̱zāʕ/	(to be hungry)
12.	b/v̱s	/bāb/	(a door)	/v̱sāb/	(to become grey-haired)
13.	b/ʔ	/bana/	(to build)	/ʔana/	(me or I)
14.	b/ḥ	/bād/	(to perish)	/ḥād/	(to turn aside)

15.	b/h	/bān/ (to appear)	/hān/	(to become easy)
16.	b/ʕ	/bār/ (to be ruined)	/ʕār/	(shame)
17.	b/k	/bāl/ (mind)	/kāl/	(to measure)
18.	b/q	/bāl/ (")	/qāl/	(to say)
19.	b/x	/bāb/ (a door)	/xāb/	(to fail)
20.	b/ɣ	/bāb/ (")	/ɣāb/	(disappear)
21.	b/r	/bāḥ/ (to reveal)	/rāḥ/	(to go away)
22.	b/s	/bār/ (to be ruined)	/sār/	(to walk)
23.	b/z	/bāḥ/ (to reveal)	/zāḥ/	(to depart)
24.	b/ṣ	/bāḥ/ (" ")	/ṣāḥ/	(to shout)
25.	b/l	/bāb/ (a door)	/bāl/	(mind)
26.	b/l̤	/uabbāh/ (prepare him for war)	/uallāh/	(by God)
27.	b/u	/bAsm/ (smiling)	/uAsm/	(marking)
28.	b/i	/bA?s/ (power)	/iA?s/	(despair)

d) The realization of /b/

The most frequent realization of this phoneme is a voiced occlusive bilabial [b]. The realizations, unvoiced and emphatic/non-emphatic are complementary, i.e. contextual variants.

It is realized as unvoiced [p] when it precedes an unvoiced consonant post nuclearity. For example, /b/ in /ḥabs/ (prison) is realized as [ḥaps].

The phoneme /f/

a) This phoneme belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /ɔ̣, ɣ̣, n, s, b, θ, t, ṭ, s̩, z, d, ḍ, s̬, z̬, x, ḥ, ʕ, h, ʔ, k, q, l, r, l̩, m, u, i/

In pos. 'i[1]' it commutes with /i, b, u, θ, ɔ, ɣ̣, n, s, s̩, z, t, ṭ, d, ḍ, s̬, z̬, x, ɣ, ḥ, ʕ, ʔ, h, k, r, q, l, m, X, ʕ̣, D, S̬, N, ø/

In pos. 'i[2]' it commutes with /b, e, ɔ, ɣ̣, t, ṭ, s, s̩, z, d, ḍ, n, s̬, z̬, ḥ, ɣ, x, ʕ, h, ʔ, k, L, r, q, m, Θ, H, T, K, ø/.

c) The identity and distinctive function of /f/ are established by the following comparisons:

1.	f/b	see: b.1		
2.	f/m	/fAs̩L/	(season)	/mAs̩L/ (serum)
3.	f/t	/fāq/	(to surpass)	/tāq/ (to desire)
4.	f/ṭ	/fār/	(to boil)	/ṭār/ (to fly)
5.	f/d	/fār/	(")	/dār/ (a house)
6.	f/ḍ	/fam/	(mouth)	/ḍam/ (to gather)
7.	f/θ	/fār/	(to boil)	/θār/ (to rise up)
8.	f/ɣ̣	/funūn/	(arts)	/ɣ̣unūn/ (suppositions)
9.	f/ɣ	/fāq/	(to surpass)	/ɣāq/ (to taste)
10.	f/n	/fār/	(to boil)	/nār/ (fire)
11.	f/z̬	/fār/	(")	/z̬ār/ (neighbour)
12.	f/s̬	/fār/	(")	/s̬ār/ (to point out)
13.	f/ʔ	/fam/	(mouth)	/ʔam/ (or)
14.	f/ḥ	/fāz/	(to win)	/ḥāz/ (to possess)
15.	f/h	/fān/	(mortal)	/hān/ (to become easy)
16.	f/ʕ	/fād/	(to benefit)	/ʕād/ (to return)
17.	f/k	/fAʔs/	(an axe)	/kAʔs/ (a glass)
18.	f/q	/fār/	(to boil)	/qār/ (tar)
19.	f/x	/fād/	(to overflow)	/xād/ (to wade through)
20.	f/ɣ	/fār/	(to boil)	/ɣār/ (to sink deeply into)

21. f/r /fA?s/ (an axe) /rA?s/(a head)

22. f/s /fār/ (to boil) /sār/ (to walk)

23. f/z /fār/ (") /zār/ (to visit)

24. f/ṣ /fār/ (") /sār/ (to become)

25. f/l /fāḥ/ (to diffuse its odour) /lāḥ/ (to appear)

26. f/l̤ /uaffāh/ (to pay him in full) /uallāh/ (by God)

27. f/u /fAhm/ (understanding) /uAhm/(fancy)

28. f/i /fA?s/ (an axe) /iA?s/(despair)

d) The realisation of /f/

The most common realization of this phoneme is an unvoiced fricative labio-dental [f].

The phoneme /m/.

a) This phoneme belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /i, u, l̤, r, l̤, q, k, ?, h, ʕ, ḥ, ɣ , x, s̬, z̬, z, s, ṣ, n, d, d̤, t, t̤, ɔ , ɔ̤ , ɵ, f, b/

In pos. 'i^1' it commutes with /x, i, ʕ , b, u, ?, l, h, s, n, s̬, z̬, f, ḥ, ɣ , ɔ , t̤, d̤, z, r, t, k, ɔ̤ , ṣ, d, D, X, ʢ, N, S̬, ø/

In pos. 'i^2' it commutes with /s, r, b, ḥ, k, d, h, m, ?, L, ʕ , n, f, z̬, s̬, ɔ̤ , q, d̤, ɣ, ṣ, ɔ , t, t̤, ɵ, z, x, H, θ, T, K, ø/

c) The identity and distinctive function of /m/ are established by the following comparisons.

1. m/b see: b.2.

2. m/f see: f.2.

3. m/t /māz̬/ (to surge) /taz̬/ (crown)

4. m/t̤ /māl/ (money) /t̤āl/ (it was lenghthened)

5. m/d /mā?/ (water) /dā?/ (disease)

6.	m/ḍ	/māʕ/ (to melt)	/ḍāʕ/ (to be lost)
7.	m/e	/rama/ (to throw)	/raea/ (to bewail)
8.	m/ẓ	/mAhr/ (dowry)	/ẓAhr/ (back)
9.	m/ɣ	/mād/ (to swing)	/ɣad/ (to defend)
10.	m/n	/mās/ (diamond)	/nās/ (people)
11.	m/ᵛz	/māʕ/ (to melt)	/ᵛzaʕ/ (to be hungry)
12.	m/ᵛs	/mā?/ (water)	/ᵛsa?/ (to will)
13.	m/?	/mās/ (diamond)	/?ās/ (myrtle)
14.	m/ħ	/māl/ (money)	/ħāl/ (condition)
15.	m/h	/maᵛz/ (to surge)	/hāᵛz/ (to stir up)
16.	m/ʕ	/māl/ (money)	/ʕāl/ (to support)
17.	m/k	/māl/ (")	/kāl/ (to measure)
18.	m/q	/māl/ (")	/qāl/ (to say)
19.	m/x	/māl/ (")	/xāl/ (maternal uncle)
20.	m/ɣ	/māl/ (")	/ɣāl/ (to assassinate)
21.	m/r	/maᵛz/ (to surge)	/rāᵛz/ (to be current)
22.	m/s	/māl/ (money)	/sāl/ (to flow)
23.	m/z	/mal/ (")	/zāl/ (to remove)
24.	m/ṣ	/mād/ (to swing)	/ṣād/ (to hunt)
25.	m/l	/māʕ/ (to melt)	/lāʕ/ (to be impatient)
26.	m/ḷ	----------	
27.	m/u	/mAsL/ (serum)	/uAsL/ (connecting)
28.	m/i	/mā?/ (water)	/iā?/ (the letter y)

d) The realisation of /m/

The most frequent realization of this phoneme is a labial nasal [m]. It is pharyngalized when it occurs in the vicinity of emphatics. The pharyngalization influence can be shown by comparing the realizations of /m/ in /mas/ (he sucked) and /mas/ (he touched).

<u>The phoneme /t/</u>

a) This phoneme belongs to pos. 'e', pos. 'i¹' and pos. 'i²'.

b) In pos. 'e' it commutes with /b, f, θ, ð, ð̣, z, š, ṣ, s, ž, t, ṭ, d, ḍ, n, ʔ, h, ɣ, x, ħ, ʕ, k, q, l, r, ḷ, m, n, i, u/

In pos. 'i¹' it commutes with /d, ṣ, ð̣, k, l, t, r, z, ḍ, ṭ, θ, q, i, ð, ɣ, m, ħ, f, ž, š, n, s, h, ʔ, b, ʕ, x, u, ʕ̵, N, X, D, Š, ∅/

In pos. 'i²' it commutes with /s, r, b, ħ, d, k, ʔ, m, h, f, n, ʕ, ž, ð̣, ṣ, š, ɣ, ḍ, q, ð, t, ṭ, e, z, x, L, H, K, T, Θ, ∅/

c) The identity and distinctive function of /t/ are established by the following comparisons.

1.	t/b	see: b.3.	
2.	t/f	see: f.3.	
3.	t/m	see: m.3.	
4.	t/ṭ	/tāb/ (to repent)	/ṭāb/ (to be good)
5.	t/d	/tAʕs/ (wretchedness)	/dAʕs/ (tread)
6.	t/ḍ	/tāq/ (to desire)	/ḍāq/ (to become narrow)
7.	t/θ	/tāb/ (to repent)	/θāb/ (to come back to)
8.	t/ð̣	/ʕAtm/ (to become dark)	/ʕAð̣m/ (bone)
9.	t/ð	/tAuq/ (to be anxious)	/ðAuq/ (to taste)
10.	t/n	/tāb/ (to repent)	/nāb/ (eye tooth)
11.	t/ž	/tāh/ (to go astray)	/žāh/ (dignity)
12.	t/š	/tāb/ (to repent)	/šāb/ (to become grey-haired)
13.	t/ʔ	/tāb/ (" ")	/ʔāb/ (to return)
14.	t/ħ	/tāq/ (to desire)	/ħāq/ (to affect)
15.	t/h	/tāb/ (to repent)	/hāb/ (to fear)

16.	t/ʕ	/tāb/ (to repent)	/ʕāb/ (to disgrace)
17.	t/k	/tIbr/ (ore)	/kIbr/ (pride)
18.	t/q	/tUfl/ (spittle)	/qUfL/ (padlock)
19.	t/x	/tāb/ (to repent)	/xāb/ (to fail)
20.	t/ɣ	/tāb/ (" ")	/ɣāb/ (to disappear)
21.	t/r	/tābiʕ/(following)	/rābiʕ/ (fourth)
22.	t/s	/tāq/ (to desire)	/sāq/ (to drive)
23.	t/z	/tāž/ (crown)	/zāž/ (green vitriol)
24.	t/ṣ	/tāb/ (to repent)	/ṣāb/ (to hit the mark)
25.	t/l	/tāq/ (to desire)	/lāq/ (to be suitable to)
26.	t/ḷ	----------	
27.	t/u	/qAtL/ (killing)	/qAuL/ (statement)
28.	t/i	/tam/ (to be finished)	/iam / (sea)

d) The realization of /t/

The most common realization of this phoneme is an unvoiced apico-alveolar [t]. It is aspirated when it precedes a front open vowel [a], as in forms like /tal/ [tall] (hill), /tam/, [tamm] (finished).

The phoneme /d/

a) The phoneme /d/ belongs to pos. 'e', pos. 'i[1]' and pos. 'i[2]'.

b) In pos. 'e' it commutes with /i, u, m, ḷ, r, q, l, k, ʔ, h, ʕ, x, ħ, ɣ, s, ž, š, z, ṣ, s, n, ḍ, d, t, ṭ, ʒ, ʒ, θ, f, b/

In pos. 'i[1]' it commutes with /u, i, x, ʕ, b, ʔ, l, h, s, n, š, ž, f, ħ, m, ɣ, ʒ, q, θ, ṭ, ḍ, z, r, t, k, ʒ, ṣ, d, N, X, D, ʢ, Š, ø/

In pos. 'i^{2}' it commutes with /s, r, d, k, h, b, ḍ, q, ẓ, v̄z, f, n, ʕ, L, ʔ, m, ɣ, v̄s, ṣ, ʒ, t, x, z, ɵ, ṭ, θ, T, H, K, ø/

c) The identity and distinctive function of /d/ are established by the following comparisons:

1.	d/b	see: b.5.	
2.	d/f	see: f.5.	
3.	d/m	see: m.5.	
4.	d/t	see: t.5.	
5.	d/ṭ	/dār/ (a house)	/ṭār/ (to fly away)
6.	d/ḍ	/dām/ (to continue)	/ḍām/ (to wrong)
7.	d/ɵ	/dār/ (a house)	/ɵār/ (to rise up)
8.	d/ẓ	/dAhr/ (age)	/ẓAhr/ (back)
9.	d/ʒ	/bAdr/ (full moon)	/bAʒr/ (sowing)
10.	d/n	/dār/ (a house)	/nār/ (fire)
11.	d/v̄z	/dār/ (")	/v̄zār/ (neighbour)
12.	d/v̄s	/dāx/ (to subdue)	/v̄sāx/ (to grow old)
13.	d/ʔ	/dam/ (blood)	/ʔam/ (or)
14.	d/ħ	/dār/ (a house)	/ħār/ (to be perplexed)
15.	d/h	/dān/ (to give on credit)	/hān/ (to become easy)
16.	d/ʕ	/dAin/ (debt)	/ʕAin/ (eye)
17.	d/k	/dam/ (blood)	/kam/ (how much?)
18.	d/q	/dār/ (a house)	/qār/ (tar)
19.	d/x	/dār/ (" ")	/xār/ (to moo "cow")
20.	d/ɣ	/dār/ (" ")	/ɣār/ (to sink deeply into)
21.	d/r	/ṛād/ (to hunt)	/ṛār/ (to become)

22.	d/s	/dār/ (a house)	/ṣār/ (to walk)
23.	d/z	/dār/ (" ")	/zār/ (to visit)
24.	d/ṣ	/dār/ (" ")	/ṣār/ (to become)
25.	d/l	/dām/ (to last)	/lām/ (to blame)
26.	d/ḷ	----------------	
27.	d/u	/žAdb/ (barrenness)	/žAub/ (exploration)
28.	d/i	/ʕAdn/ (Eden)	/ʕAin/ (eye)

d) The realization of /d/

The most common realization of this phoneme is a voiced apico-alveolar occlusive [d].

The phoneme /ṭ/

a) The phoneme /ṭ/ belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /b, f, θ, ð, ð̣, t, d, ḍ, n, s, ṣ, z, š, ž, x, ɣ, ħ, ʕ, h, ʔ, k, q, l, r, ḷ, m, u, i/

In pos. 'i^1' it commutes with /n, x, ʕ, b, ʔ, l, h, s, u, š, ž, f, ħ, m, ɣ, ð, i, q, k, θ, ḍ, z, r, t, ð̣, ṣ, d, N, D, ʕ, Š, X, ∅/

In pos. 'i^2' it commutes with /s, r, b, ħ, k, d, h, m, ʔ, L, ʕ, n, f, ẓ̌, ð̣, q, ḍ, ɣ, š, ṣ, ð, t, ṭ, θ, z, x, Θ, K, H, T, ∅/

c) The identity and distinctive function of /ṭ/ are established by the following comparisons:

1. ṭ/b see: b.4.
2. ṭ/f see: f.4.
3. ṭ/m see: m.4.

4.	t/t	see: t.4.	
5.	t/d	see: d.5.	
6.	t/d	/tār/ (to fly away)	/dār/ (harmful)
7.	t/ɵ	/tār/ (to fly away)	/ɵār/ (to rise up)
8.	t/ɤ	/tArf/ (edge)	/ɤArf/ (an envelope)
9.	t/ɤ	/tāb/ (to be good)	/ɤāb/ (to melt)
10.	t/n	/tāb/ (" " ")	/nāb/ (eye tooth)
11.	t/ᵛz	/tār/ (to fly away)	/ᵛzār/ (neighbour)
12.	t/ᵛs	/tāb/ (to be good)	/ᵛsāb/ (to become grey-haired)
13.	t/ʔ	/tās/ (drinking cup)	/ʔās/ (myrtle)
14.	t/ħ	/tār/ (to fly)	/ħār/ (to be perplexed)
15.	t/h	/tāb/ (to be good)	/hāb/ (to fear)
16.	t/ʕ	/tāf/ (to go round a place)	/ʕāf/ (to loathe)
17.	t/k	/tāl/ (to be long)	/kāl/ (to measure)
18.	t/q	/tāl/ (" " ")	/qāl/ (to say)
19.	t/x	/tāl/ (" " ")	/xāl/ (maternal uncle)
20.	t/ɣ	/tār/ (to fly)	/ɣār/ (to sink deeply into)
21.	t/r	/tāf/ (to go round a place)	/rāf/ (to sew)
22.	t/s	/tār/ (to fly)	/sār/ (to walk)
23.	t/z	/tār/ (" ")	/zār/ (to visit)
24.	t/s	/tār/ (" ")	/sār/ (to become)
25.	t/l	/tāʕ/ (to obey)	/lāʕ/ (to be impatient)
26.	t/l	/uattāh/ (to lower it)	/uallāh/ (by God)
27.	t/u	/tArd/ (driving away)	/uArd/ (roses)
28.	t/i	/nAtħ/ (act of butting)	/nAuħ/ (wailing)

d) The realization of /ṭ/

This phoneme is the emphatic counterpart of /t/. The realization of this phoneme is an emphatic apico-dental occlusive unvoiced [t̪]. In comparison with /t/, /ṭ/ is characterised by a narrow pharyngeal aperture, and a slight protrusion of the lips. The velarization effect of /ṭ/ does spread on the whole syllable in which it occurs, no matter whether it is pre-nuclear or post-nuclear. Thus, /b/ in /baṭ/ (ducks) and /ṭab/ (to treat) becomes velarized [baṭ̪], [ṭab̪]. The pharyngalization of non-emphatic elements is purely contextual variant, i.e. in Modern Standard Arabic, there is no emphatic /b̲/ opposed to /b/.

The phoneme /θ/.

a) The phoneme /θ/ belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /b, f, ḫ, ġ, t, ṭ, d, ḍ, n, s, ṣ, z, v̌s, v̌z, x, ɣ, h, ʕ, ḥ, ?, k, q, l, r, l̤, m, u, i/

In pos. 'i^1' it commutes with /d, ṣ, ɣ, k, t, r, z, ḍ, ṭ, q, i, ḫ, ġ, m, h, f, v̌z, v̌s, n, s, h, l, ?, b, ʕ, x, u, v̌š, ǯ, D, X, N, ø/

In pos. 'i^2' it commutes with /s, r, b, h, k, d, h, m, ?, L, ʕ, n, f, v̌z, ɣ, q, ḍ, ḫ, v̌s, ṣ, ġ, t, ṭ, z, x, K, H, T, θ, ø/

c) The identity and distinctive function of /θ/ are established by the following comparisons:

1. θ/b see: b.7.
2. θ/f see: f.7.
3. θ/m see: m.7.
4. θ/t see: t.7.
5. θ/ṭ see: ṭ.7.
6. θ/d see: d.7.

7.	θ/ḍ	/θār/	(to rise up)	/ḍār/	(to starve)
8.	θ/ẓ	/ẓāθ/	(to aid)	/ẓāẓ/	(to make angry)
9.	θ/ʒ	/θāb/	(to return)	/ʒāb/	(to melt)
10.	θ/n	/θār/	(to rise up)	/nār/	(fire)
11.	θ/ᵛz	/θAur/	(an ox)	/ᵛzAur/	(injustice)
12.	θ/ᵛs	/θāb/	(to return)	/ᵛsāb/	(to become grey-haired)
13.	θ/ʔ	/θab/	(" ")	/ʔāb/	(to come back)
14.	θ/ḥ	/θār/	(to rise up)	/ḥār/	(to be perplexed)
15.	θ/h	/θāb/	(to return)	/hāb/	(to fear)
16.	θ/ʕ	/θār/	(to rise up)	/ʕār/	(shame)
17.	θ/k	/uAθr/	(to be soft)	/uAkr/	(nest of a bird)
18.	θ/q	/θār/	(to rise up)	/qār/	(tar)
19.	θ/x	/θāb/	(to return)	/xāb/	(to be disappointed)
20.	θ/ɣ	/θār/	(to rise up)	/ɣār/	(to be jealous)
21.	θ/r	/θāb/	(to return)	/rāb/	(to curdle)
22.	θ/s	/θār/	(to rise up)	/sār/	(to walk)
23.	θ/z	/θAur/	(an ox)	/zAur/	(throat)
24.	θ/ṣ	/θāb/	(to return)	/ṣāb/	(to hit the mark)
25.	θ/l	/ʕaθ/	(to do mischief)	/ʕāl/	(to burden)
26.	θ/ḷ	----------			
27.	θ/u	/θara/	(sand)	/uara/	(to cover)
28.	θ/i	/θara/	(")	/iara/	(to see)

d) The realization of /θ/

The phoneme /θ/ is realized as an apico-dental fricative, unvoiced [θ].

The phoneme /ɔ̈/.

a) The phoneme /ɔ̈/ belongs to pos. 'e', pos. 'i[1]' and pos. 'i[2]'.

b) In pos. 'e' it commutes with /i, u, m, l̤, r, l, q, k, ʔ, h, ʕ, ḥ, ɣ, x, v̤z, v̤s, z, s̤, s, n, d, d̤, t, t̤, ɔ̈, ɵ, f, b/

c) In pos. 'i[1]' it commutes with /x, u, b, ʕ, l, h, ʔ, s, n, v̤s, v̤z, f, ḥ, m, ɣ, ɔ̈, i, q, ɵ, t̤, d̤, d, s̤, k, t, r, z, N, X, D, ʢ, v̤S, ø/

In pos. 'i[2]' it commutes with /s, r, b, h, k, d, m, n, h, ʔ, L, ʕ, f, v̤z, q, d̤, ɣ, v̤s, s̤, ɔ̈, t, t̤, ɵ, z, x, K, H, Θ, T, ø/

The identity and distinctive function of /ɔ̈/ are established by the following comparisons:

1.	ɔ̈/b	see: b.9.	
2.	ɔ̈/f	see: f.9.	
3.	ɔ̈/m	see: m.9.	
4.	ɔ̈/t	see: t.9.	
5.	ɔ̈/t̤	see: t̤.9.	
6.	ɔ̈/d	see: d.9.	
7.	ɔ̈/Θ	see: Θ.9.	
8.	ɔ̈/d̤	/ɔ̈āʕ/ (to be spread about)	/d̤āʕ/ (to be lost)
9.	ɔ̈/ɔ̤̈	/ɔ̈Arf/ (to flow)	/ɔ̤̈Arf/ (an envelope)
10.	ɔ̈/n	/ɔ̈āb/ (to melt)	/nāb/ (eye tooth)
11.	ɔ̈/v̤z	/ɔ̈āb/ (" ")	/v̤zāb/ (to explore)
12.	ɔ̈/v̤s	/ɔ̈āb/ (" ")	/v̤sāb/ (to become grey-haired)
13.	ɔ̈/ʔ	/ɔ̈āb/ (" ")	/ʔāb/ (to return)
14.	ɔ̈/ḥ	/ɔ̈ād/ (to defend)	/ḥād/ (to turn aside)
15.	ɔ̈/h	/ɔ̈āb/ (to melt)	/hāb/ (to fear)

16.	ʒ/ʕ	/ʒād/	(to defend)	/ʕād/ (to return)
17.	ʒ/k	/ʒād/	(" ")	/kād/ (to be on the point of)
18.	ʒ/q	/ʒād/	(to defend)	/qād/ (to lead)
19.	ʒ/x	/ʒāb/	(to melt)	/xāb/ (to be disappointed)
20.	ʒ/ɣ	/ʒāb/	(" ")	/ɣāb/ (to be disappeared)
21.	ʒ/r	/ʒāb/	(" ")	/rāb/ (to curdle 'milk')
22.	ʒ/s	/ʒāq/	(to taste)	/sāq/ (to drive)
23.	ʒ/z	/ʒad/	(to defend)	/zād/ (to increase)
24.	ʒ/ṣ	/ʒāb/	(to melt)	/ṣāb/ (to hit the mark)
25.	ʒ/l	/ʒāq/	(to taste)	/lāq/ (to be suitable to)
26.	ʒ/ḷ	----------		
27.	ʒ/u	/nAʒL/	(vile)	/nAul/ (giving)
28.	ʒ/i	/nAʒL/	(")	/nAiL/ (obtainment)

d) The realization of /ʒ/.

The phoneme /ʒ/ is realized as an apico-dental fricative, voiced, [ʒ].

The phoneme /ʒ̣/.

a) The phoneme /ʒ̣/ belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /b, f, ɵ, ʒ, t, ṭ, d, ḍ, n, s, ṣ, z, s̬, z̬, x, l, ħ, ʔ, h, ʕ, k, q, ɣ, r, ḷ, m, u, i/

In pos. 'i^1' it commutes with /u, x, ʕ, b, ʔ, l, h, s, n, s̬, z̬, f, ħ, m, ɣ, ʒ, i, q, ɵ, ṭ, ḍ, z, r, t, k, s, d, S, ʃ, D, X, N, ø/

In pos. 'i^2' it commutes with /s, r, b, h, k, d, h, m, ʔ, L, ʕ, n, f, z̬, q, ḍ, ɣ, s̬, ṣ, ʒ, t, ṭ, ɵ, z, x, K, H, Θ, T, ø/

c) The identity and distinctive function of /ʒ̣/ are established in the following comparisons.

1. ʒ̣/b see: b.8.
2. ʒ̣/f see: f.8.
3. ʒ̣/m see: m.8.
4. ʒ̣/t see: t.8.
5. ʒ̣/ṭ see: ṭ.8.
6. ʒ̣/d see: d.8.
7. ʒ̣/θ see: θ.8.
8. ʒ̣/ʒ see: ʒ.9.
9. ʒ̣/ḍ /ʒ̣an/ (to suspect) /ḍan/ (to withhold)
10. ʒ̣/n /ʒ̣Ahr/ (back) /nAhr/ (river)
11. ʒ̣/ž /naʒ̣ar/ (eyesight) /naẓ̌ar/ (to smooth "wood")
12. ʒ̣/š /ʒ̣Ahr/ (back) /šAhr/ (month)
13. ʒ̣/ʔ /ʒ̣abi/ (deer) /ʔabi/ (my father)
14. ʒ̣/ḥ /ʒ̣Arf/ (an envelope) /ḥArf/ (a letter)
15. ʒ̣/h /nAʒ̣m/ (arrangement) /nAhm/ (greedy)
16. ʒ̣/ʕ /ʒ̣ālim/ (unjust) /ʕālim/ (scientist)
17. ʒ̣/k /ʒ̣Amʔ/ (to be thirsty) /kAmʔ/ (kind of vegetables)
18. ʒ̣/q /nAʒ̣m/ (arrangement) /nAqm/ (indignation)
19. ʒ̣/x /naʒ̣ar/(eyesight) /naxar/ (to eat into)
20. ʒ̣/ɣ /ʒ̣Arf/ (an envelope) /ɣArf/ (to dip up)
21. ʒ̣/r /ɣaʒ̣/ (to make angry) /ɣār/ (to be jealous)
22. ʒ̣/s /ʒ̣abi/ (dear) /sabi/ (captivity)
23. ʒ̣/z /ʕAʒ̣m/ (bone) /ʕAzm/ (resolution)

24.	ʂ/s	/ʂabi/ (deer)	/sabi/ (boy)
25.	ʂ/l	/ʂan/ (to suspect)	/lan/ (will never)
26.	ʂ/l	----------	
27.	ʂ/u	/nAʂm/ (arrangement)	/nAum/ (sleeping)
28.	ʂ/i	/ħAʂr/ (interdiction)	/ħAir/ (perplexity)

d) The realization of /ʂ/.

The phoneme /ʂ/ is realized as an emphatic, voiced apico-dental fricative [ʂ]. On the realization of this phoneme, the back of the tongue is raised to produce a narrow pharyngeal aperture, and the lips are slightly protruded. Similar considerations of pharyngalization mentioned under /t/ apply to /ʂ/.

The phoneme /d/.

a) This phoneme belongs to pos. 'e', pos. 'i^{1}' and pos. 'i^{2}'.

b) In pos. 'e' it commutes with /i, u, m, l, r, l, q, k, ʔ, h, ʕ, ħ, ɣ, x, ᵛz, ᵛs, z, s, s, n, d, t, t, ʒ, ʂ, ɵ, f, b/

In pos. 'i^{1}' it commutes with /s, d, ʂ, k, t, r, z, t, ɵ, q, i, ʒ, ɣ, m, ħ, f, ᵛz, ᵛs, n, s, h, l, ʔ, b, ʕ, x, u, ᵛS, ʕ, D, N, X, ø/

In pos. 'i^{2}' it commutes with /s, r, b, ħ, k, d, h, m, ʔ, L, n, f, ž, ʂ, q, ʕ, ɣ, ᵛs, s, ʒ, t, t, ɵ, z, x, T, K, H, Θ, ø/

c) The identity and distinctive function of /d/ are established by the following comparisons:

1. d/b see: b.6.
2. d/f see: f.6.
3. d/m see: m.6.

4.	d/t	see: t.6.		
5.	d/ṭ	see: ṭ.6.		
6.	d/d	see: d.6.		
7.	d/θ	see: θ.6.		
8.	d/ɣ	see: ɣ.8.		
9.	d/ɣ	see: ɣ.9.		
10.	d/n	/dār/	(to starve)	/nār/ (fire)
11.	d/z	/dār/	(" ")	/ᵛzār/ (neighbour)
12.	d/ᵛs	/dāʕ/	(to be lost)	/ᵛsāʕ/ (to be spread)
13.	d/ʔ	/dum/	(gather!)	/ʔum/ (mother)
14.	d/ḥ	/dām/	(to wrong)	/ḥām/ (to hover)
15.	d/h	/dām/	(" ")	/hām/ (to wonder about)
16.	d/ʕ	/dāf/	(to stay as a guest)	/ʕāf/ (to loathe)
17.	d/k	/dArb/	(beating)	/kArb/ (distress)
18.	d/q	/dār/	(to starve)	/qār/ (tar)
19.	d/x	/dāf/	(to stay as a guest)	/xāf/ (to be afraid of)
20.	d/ɣ	/dār/	(to starve)	/ɣār/ (to sink deeply into)
21.	d/r	/dAbṭ/	(seizure)	/rAbṭ/ (tying)
22.	d/s	/dāq/	(to become narrow)	/sāq/ (to drive)
23.	d/z	/dār/	(to starve)	/zār/ (to visit)
24.	d/ṣ	/dār/	(" ")	/ṣār/ (to become)
25.	d/l	/dām/	(to wrong)	/lām/ (to blame)
26.	d/ɬ	----------		
27.	d/u	/dAḥL/	(shallow)	/uAḥL/ (soft mud)
28.	d/i	/bAdʕ/	(amputation)	/bAiʕ/ (to sell)

d) The realization of /d̤/

This phoneme is realized as an emphatic apico-dental occlusive, voiced [d].

The phoneme /n/.

a) This phoneme belongs to pos. 'e', pos. 'i[1]' and pos. 'i[2]'.

b) In pos. 'e' it commutes with /b, f, ɵ, ɤ, ɣ̤, t, t̤, d, d̤, s, s̤, z, s̬, z̬, x, ɣ, ḥ, ʕ, h, ʔ, k, q, l, r, l̤, m, u, i/

In pos. 'i[1]' it commutes with /u, x, ʕ, b, ʔ, l, h, s, n, s̬, z̬, f, ḥ, m, ɤ, ɣ̤, i, q, ɵ, t̤, d̤, z, r, t, k, ɣ̤, s̤, d, N, Š, ʢ, D, X, ø/

In pos. 'i[2]' it commutes with /s, r, b, h, k, d, h, m, ʔ, L, ʕ, n, f, z̬, ɣ̤, q, d̤, ɤ, s̬, s̤, ɣ̤, t, t̤, ɵ, z, x, H, K, Θ, T, ø/

c) The identity and distinctive function of /n/ are established by the following comparisons:

1. n/b see: b. 10.
2. n/f see: f. 10.
3. n/m see: m. 10.
4. n/t see: t. 10.
5. n/t̤ see: t. 10.
6. n/d see: d. 10.
7. n/ɵ see: ɵ. 10.
8. n/ɣ̤ see: ɤ. 10.
9. n/ɣ̤ see: ɣ̤. 10.
10. n/d̤ see: d̤. 10.

11.	n/$\overset{v}{z}$	/nār/	(fire)	/$\overset{v}{z}$ār/	(neighbour)
12.	n/$\overset{v}{s}$	/nār/	(")	/$\overset{v}{s}$ār/	(to consult)
13.	n/ʔ	/nās/	(people)	/ʔās/	(myrtle)
14.	n/ḥ	/nār/	(fire)	/ḥār/	(to be perplexed)
15.	n/h	/nām/	(to sleep)	/hām/	(to wander about)
16.	n/ʕ	/nām/	(" ")	/ʕām/	(to swim)
17.	n/k	/nāl/	(to get)	/kāl/	(to measure)
18.	n/q	/nām/	(to sleep)	/qām/	(to stand up)
19.	n/x	/nāb/	(eyetooth)	/xāb/	(to be disappointed)
20.	n/ɣ	/nāb/	(")	/ɣāb/	(to be disappeared)
21.	n/r	/nāḥ/	(to wail)	/rāḥ/	(to go away)
22.	n/s	/nār/	(fire)	/sār/	(to walk)
23.	n/z	/nār/	(")	/zār/	(to visit)
24.	n/ṣ	/nām/	(to sleep)	/ṣām/	(to fast)
25.	n/l	/nām/	(" ")	/lām/	(to blame)
26.	n/l̤	/uannāh/	(preventing him from working hard)	/uallāh/	(by God)
27.	n/u	/nAṣL/	(blade of a knife)	/uAṣL/	(joining)
28.	n/i	/nAum/	(sleeping)	/iAum/	(a day)

d) The realization of /n/

The most frequent realization of this phoneme is a nasal alveolar [n]. It is pharyngalized when it lies in the vicinity of emphatics.

The phoneme /$\overset{v}{z}$/.

a) This phoneme belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /b, f, ɵ, ɤ̣, ɣ̣, t, ṭ, d, ḍ, n, s, ṣ, z, s̬, x, ɣ, ḥ, ʕ, h, ʔ, k, q, l, r, ḷ, m, n, i/

In pos. 'i[1]' it commutes with /u, x, ʕ, b, ʔ, l, h, s, n, s̬, f, ḥ, m, ɤ, ɤ̣, i, q, ɵ, ṭ, ḍ, z, r, t, k, ɣ̣, ṣ, ḍ, S̬, ʕ̣, D, X, N, ø/

In pos. 'i[2]' it commutes with /s, r, b, ḥ, k, d, h, m, ʔ, L, ʕ, n, f, ɣ̣, q, ḍ, ɤ, s̬, ṣ, ɤ̣, t, ṭ, ɵ, z, x, ɵ, T, H, K, ø/.

c) The identity and distinctive function of /z̬/ are established by the following comparisons:

1. z̬/b see: b. ll.
2. z̬/f see: f. ll.
3. z̬/m see: m. ll.
4. z̬/t see: t. ll.
5. z̬/ṭ see: ṭ. ll.
6. z̬/d see: d. ll.
7. z̬/ɵ see: ɵ. ll.
8. z̬/ɤ see: ɤ. ll.
9. z̬/ɣ̣ see: ɣ̣. ll.
10. z̬/d see: ḍ. ll.
11. z̬/n see: n. ll.
12. z̬/s̬ /z̬ār/ (neighbour) /s̬ār/ (to point at)
13. z̬/ʔ /z̬āb/ (to explore) /ʔāb/ (to return)
14. z̬/ḥ /z̬ād/ (to give liberally or freely to) /ḥād/ (to turn aside)
15. z̬/h /z̬āb/ (to explore) /hāb/ (to be afraid of)
16. z̬/ʕ /z̬ās̬/ (to swell) /ʕās̬/ (to live)

17.	$\overset{v}{z}$/k	/$\overset{v}{z}$ād/ (to give liberally or freely to)	/kād/	(to deceive)
18.	$\overset{v}{z}$/q	/$\overset{v}{z}$āl/ (to go about)	/qāl/	(to say)
19.	$\overset{v}{z}$/x	/$\overset{v}{z}$āb/ (to explore)	/xāb/	(to fail)
20.	$\overset{v}{z}$/ɣ	/$\overset{v}{z}$ar/ (neighbour)	/ɣār/	(to sink deeply into)
21.	$\overset{v}{z}$/r	/$\overset{v}{z}$āb/ (to explore)	/rāb/	(to curdle 'milk')
22.	$\overset{v}{z}$/s	/$\overset{v}{z}$ā?/ (to come)	/sā?/	(to be bad)
23.	$\overset{v}{z}$/z	/$\overset{v}{z}$ār/ (neighbour)	/zār/	(to visit)
24.	$\overset{v}{z}$/ṣ	/$\overset{v}{z}$ār/ (")	/ṣār/	(to become)
25.	$\overset{v}{z}$/l	/$\overset{v}{z}$āʕ/ (to be hungry)	/lā?/	(to be impatient)
26.	$\overset{v}{z}$/ḷ	----------		
27.	$\overset{v}{z}$/u	/rA$\overset{v}{z}$m/ (stoning)	/rAum/	(wish)
28.	$\overset{v}{z}$/i	/nA$\overset{v}{z}$L/ (son)	/nAiL/	(obtainment)

d) The realisation of /$\overset{v}{z}$/.

The most frequent realization of this phoneme is a voiced pre-palatal occlusive [$\overset{v}{z}$]. It is pharyngalized when it occurs in the vicinity of emphatics. The realization of /$\overset{v}{z}$/ in /ṭa$\overset{v}{z}$n/ (a fried thing) is pharyngalized [ṭa$\overset{v}{z}$n], while it is non-pharyngalized in the vicinity of non-emphatics as /$\overset{v}{z}$/ in /da$\overset{v}{z}$n/ (plenty of rain) [da$\overset{v}{z}$n].

The phoneme /$\overset{v}{s}$/.

a) The phoneme /$\overset{v}{s}$/ belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /b, f, ɵ, ɬ, ɮ, t, ṭ, d, ḍ, n, s, ṣ, z, $\overset{v}{z}$, x, ɣ, ḥ, ʕ, h, ʔ, k, q, l, r, ḷ, m, i, u/

In pos. 'i[1]' it commutes with /d, ṣ, ʒ̣, k, t, r, z, ḍ, ṭ, ɵ, q, i ʒ, ɣ, m, h, f, v̄z, n, s, h, l, ʔ, b, ʕ, x, u, ɣ̄, N, v̄š, D, X, ø/

In pos. 'i[2]' it commutes with /s, r, b, ḥ, k, d, h, m, ʔ, L, ʕ, n, f, v̄z, ʒ̣, q, ḍ, ɣ, ṣ, ʒ̣, t, ṭ, ɵ, z, x, ɵ, T, K, H, ø/

c) The identity and distinctive function of /v̄s/ are established by the following comparisons:

1. v̄s/b see: b. 12.
2. v̄s/f see: f. 12.
3. v̄s/m see: m. 12.
4. v̄s/t see: t. 12.
5. v̄s/ṭ see: ṭ. 12.
6. v̄s/d see: d. 12.
7. v̄s/ɵ see: ɵ. 12.
8. v̄s/ʒ see: ʒ. 12.
9. v̄s/ʒ̣ see: ʒ̣. 12.
10. v̄s/d see: d. 12.
11. v̄s/n see: n. 12.
12. v̄s/v̄z see: v̄z. 12.
13. v̄s/ʔ /v̄sāb/ (to become grey-haired) /ʔāb/ (to return)
14. v̄s/ḥ /v̄sād/ (to build up) /ḥād/ (to turn aside)
15. v̄s/h /v̄sāb/ (to become grey-haired) /hāb/ (to fear)
16. v̄s/ʕ /v̄sād/ (to build up) /ʕād/ (to return back)
17. v̄s/k /v̄sāl/ (to rise) /kāl/ (to measure)
18. v̄s/q /v̄sāl/ (" ") /qāl/ (to say)
19. v̄s/x /v̄sāf/ (to see) /xāf/ (to be afraid of)
20. v̄s/ɣ /v̄sār/ (to point at) /ɣār/ (to sink deeply into)

21. $\overset{v}{s}$/r /$\overset{v}{s}\bar{a}b$/ (to become grey-haired) /$r\bar{a}b$/ (to curdle 'milk')

22. $\overset{v}{s}$/s /$\overset{v}{s}\bar{a}r$/ (to point at) /$s\bar{a}r$/ (to walk)

23. $\overset{v}{s}$/z /$\overset{v}{s}\bar{a}r$/ (" " ") /$z\bar{a}r$/ (to visit)

24. $\overset{v}{s}$/$\dot{s}$ /$\overset{v}{s}\bar{a}d$/ (to build up) /$\dot{s}\bar{a}d$/ (to hunt)

25. $\overset{v}{s}$/l /$\overset{v}{s}\bar{a}ʕ$/ (to spread) /$l\bar{a}ʕ$/ (to be impatient)

26. $\overset{v}{s}$/$\dot{l}$ /ua$\overset{vv}{s}\bar{a}h$/ (he dressed him) /ua$\dot{l}\bar{a}h$/ (by God)

27. $\overset{v}{s}$/u /fA$\overset{v}{s}$r/ (to brag) /fAur/ (boiling)

28. $\overset{v}{s}$/i /$\hbar$A$\overset{v}{s}$d/ (assembling) /$\hbar$Aid/ (turning aside)

d) The realization of /$\overset{v}{s}$/

This phoneme is realized as an unvoiced pre-palatal fricative [$\overset{v}{s}$]. In the vicinity of emphatics, it is liable to pharyngalization. The realization of /$\overset{v}{s}$/ in /$\overset{v}{s}\dot{a}t$/ (a shore) is pharyngalized [$\overset{v}{\underline{s}}\dot{a}t$], while it is non-pharyngalized in the vicinity of non-emphatics as in /$\overset{v}{s}$/ in /$\overset{v}{s}$at/ (separation) [$\overset{v}{s}$at].

The phoneme /ʔ/.

a) This phoneme belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /i, u, m, $\dot{l}$, r, l, q, k, h, s, $\hbar$, ɣ, x, $\overset{v}{z}$, $\overset{v}{s}$, z, $\dot{s}$, s, n, $\dot{d}$, d, t, $\dot{t}$, $\dot{ɣ}$, $\dot{x}$, ɵ, f, b/

In pos. 'i^1' it commutes with /u, x, ʕ, b, l, h, s, n, $\overset{v}{s}$, $\overset{v}{z}$, $\hbar$, f, m, ɣ, ɔ, i, q, ɵ, $\dot{t}$, $\dot{d}$, z, r, t, k, $\dot{ɣ}$, $\dot{s}$, d, $\not{f}$, D, $\overset{v}{S}$, X, N, ø/

In pos. 'i^2' it commutes with /s, r, b, h, k, d, m, L, $\dot{s}$, $\overset{v}{s}$, ɣ, $\dot{d}$, q, $\dot{ɣ}$, $\overset{v}{z}$, f, n, ʕ, ɔ, t, t, ɵ, z, x, H, K, T, θ, ø/

c) The identity and distinctive function of /ʔ/ are established by the following comparisons:

1.	ʔ/b	see:	b.13.
2.	ʔ/f	see:	f.13.
3.	ʔ/m	see:	m.13.
4.	ʔ/t	see:	t.13.
5.	ʔ/ṭ	see:	ṭ.13.
6.	ʔ/d	see:	d.13.
7.	ʔ/θ	see:	θ.13.
8.	ʔ/ɣ	see:	ɣ.13.
9.	ʔ/ɣ̣	see:	ɣ̣.13.
10.	ʔ/ḍ	see:	ḍ.13.
11.	ʔ/n	see:	n.13.
12.	ʔ/ᵛz	see:	ᵛz.13.
13.	ʔ/ᵛs	see:	ᵛs.13.

14.	ʔ/ħ	/ʔān/	(time)	/ħān/	(to draw near)
15.	ʔ/h	/ʔāb/	(to return)	/hāb/	(to fear)
16.	ʔ/ʕ	/ᵛžāʔ/	(to come)	/ᵛžāʕ/	(to be hungry)
17.	ʔ/k	/bIʔr/	(well)	/bIkr/	(first-born)
18.	ʔ/q	/sāʔ/	(to be bad)	/sāq/	(to drive)
19.	ʔ/x	/dāʔ/	(disease)	/dāx/	(to subdue)
20.	ʔ/ɣ	/ʔazal/	(eternity)	/ɣazal/	(flirtation)
21.	ʔ/r	/sāʔ/	(to be bad)	/sār/	(to walk)
22.	ʔ/s	/dāʔ/	(disease)	/dās/	(to tread on)
23.	ʔ/z	/ʔAuᵛž/	(zenith)	/zAuᵛž/	(husband)
24.	ʔ/ṣ	/ʔāb/	(to return)	/ṣāb/	(to hit the mark)
25.	ʔ/l	/ᵛžāʔ/	(to come)	/ᵛžāl/	(to go about)
26.	ʔ/ḷ	----------			

27. ʔ/u /ʔAsL/ (origin) /uAsL/ (connecting)

28. ʔ/i /ʔamīn/(trustworthy) /iamīn/ (right side)

d) The realization of /ʔ/.

This phoneme is realized as an unvoiced glottal stop [ʔ]. It is liable to pharyngalization in the vicinity of emphatics. The sound [ʔ] in [ʔaṭbaʕ] (I type) is phonetically different from [ʔ] in [ʔatbaʕ] (I follow).

The phoneme /ħ/.

a) This phoneme belongs to pos. 'e', pos. 'i[1]' and pos. 'i[2]'.

b) In pos. 'e' it commutes with /q, l, r, m, u, i, ḷ, b, f, ɣ, ɣ̣, ʔ, t, ṭ, d, ḍ, s, z, ṣ, z̬, s̬, x, ɣ, ʕ, h, k/

In pos. 'i[1]' it commutes with /z, ḍ, ṭ, ɵ, q, i, ɣ, ɣ, m, f, ʔ, z̬, s̬, n, s, h, l, b, ʕ, x, u, r, t, k, ɣ̣, ṣ, d, X, S̬, N, D, ʢ, ø/

In pos. 'i[2]' it commutes with /t, ṭ, ɵ, z, x, s, r, b, h, k, d, m, ʔ, L, ʕ, n, f, z̬, ɣ̣, q, ḍ, ɣ, s̬, ṣ, ɣ, K, H, Θ, T, ø/

c) The identity and distinctive function of /ħ/ are established by the following comparisons:

1. ħ/b see: b.14.
2. ħ/f see: f.14.
3. ħ/m see: m.14.
4. ħ/t see: t.14.
5. ħ/t see: t.14.
6. ħ/d see: d.14.
7. ħ/ɵ see: ɵ.14.

8. ħ/ɤ see: ɤ.14.

9. ħ/ɣ̣ see: ɣ̣.14.

10. ħ/d̤ see: d̤.14.

11. ħ/n see: n.14.

12. ħ/z^{v} see: z^{v}.14.

13. ħ/s^{v} see: s^{v}.14.

14. ħ/ʔ see: ʔ.14.

15. ħ/h /ħām/ (to hover) /hām/ (to wander about)

16. ħ/ʕ /ħād/ (to turn aside) /ʕād/ (to come back)

17. ħ/k /ħāl/ (condition) /kāl/ (to measure)

18. ħ/q /ħāl/ (condition) /qāl/ (to say)

19. ħ/x /ħān/ (to draw near) /xān/ (to betray)

20. ħ/ɣ /ħār/ (to berperplexed) /ɣār/ (to sink deeply into)

21. ħ/r /ħād/ (to turn aside) /rād/ (to explore)

22. ħ/s /ħāq/ (to affect) /sāq/ (to drive)

23. ħ/z /ħār/ (to be perplexed) /zār/ (to visit)

24. ħ/ṣ /ħān/ (to draw near) /ṣān/ (to preserve)

25. ħ/l /ħām/ (to hover) /lām/ (to blame)

26. ħ/l /uaħħāh/ (to make a sign to) /uallāh/ (by God)

27. ħ/u /ħAsm/ (settlement) /uAsm/ (branding)

28. ħ/i /ħAbs/ (prison) /iAbs/ (dryness)

d) The realization of /ħ/.

The most frequent realization of this phoneme is pharyngal, fricative, unvoiced, non-emphatic [ħ].

The phoneme /h/.

a) This phoneme belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /b, f, ɵ, t, ṭ, ʒ, ʒ̣, d, ḍ, n, s, z, s̬, ṣ, z̬, x, ɣ, ḥ, ʕ, ʔ, k, q, l, r, ḷ, u, m, i/

In pos. 'i^1' it commutes with /u, x, ʕ, b, ʔ, l, s, n, s̬, z̬, f, ḥ, m, ɣ, ʒ, i, q, θ, ṭ, ḍ, z, r, t, d, ʒ̣, k, ṣ, S̬, X, N, D, ʢ, ø/

In pos. 'i^2' it commutes with /b, s, r, h, k, d, m, ʔ, L, ʕ, n, f, z̬, ʒ̣, q, ḍ, ɣ, s̬, ṣ, ʒ, t, ṭ, ɵ, z, x, H, K, θ, T, ø/

c) The identity and distinctive function of /h/ are established by the following comparisons:

1. h/b see: b. 15.
2. h/f see: f. 15.
3. h/m see: m. 15.
4. h/t see: t. 15.
5. h/ṭ see: ṭ. 15.
6. h/d see: d. 15.
7. h/θ see: θ. 15.
8. h/ʒ see: ʒ. 15.
9. h/ʒ̣ see: ʒ̣. 15.
10. h/ḍ see: ḍ. 15.
11. h/n see: n. 15.
12. h/z̬ see: z̬. 15.
13. h/s̬ see: s̬. 15.
14. h/ʔ see: ʔ. 15.
15. h/ḥ see: ḥ. 15.

16.	h/ʕ	/hām/	(to wonder about)	/ʕām/ (to swim)
17.	h/k	/hāl/	(to pour down)	/kāl/ (to measure)
18.	h/q	/hAbr/	(meat)	/qAbr/ (tomb)
19.	h/x	/hāb/	(to fear)	/xāb/ (to fail)
20.	h/ɣ	/hāb/	(" ")	/ɣāb/ (to disappear)
21.	h/r	/hāž/	(to be excited)	/rāž/ (to be current)
22.	h/s	/hāb/	(to fear)	/sāb/ (to run)
23.	h/z	/hāl/	(to pour down)	/zāl/ (to vanish)
24.	h/ṣ	/hām/	(to wander about)	/ṣām/ (to fast)
25.	h/l	/hān/	(to become easy)	/lān/ (to be soft)
26.	h/ḷ	----------		
27.	h/u	/hAbr/	(meat)	/uAbr/ (cony)
28.	h/i	/sAhL/	(easy)	/sAiL/ (flood)

d) The realization of /h/

The most frequent realization of this phoneme is an unvoiced glottal, non-emphatic [h] with the glottis half-closed. When it occurs in the vicinity of emphatics the glottal aperture tends towards narrowing.

The phoneme /ʕ/.

a) This phoneme belongs to pos. 'e', pos. 'i^{1}' and pos. 'i^{2}'.

b) In pos. 'e' it commutes with /b, f, ɵ, ɣ, ḫ, t, ṭ, d, ḍ, n, s, ṣ, z, š, ž, x, ɣ, ḥ, h, ʔ, k, q, l, r, ḷ, m, u, i/

In pos. 'i^{1}' it commutes with /u, x, b, l, h, s, n, š, ž, f, ḥ, m, ɣ, ɣ, i, q, ɵ, ṭ, ḍ, z, r, t, k, ḫ, ṣ, d, D, š, X, N, ʕ, ø/

In pos. 'i^2' it commutes with /s, r, b, ḥ, k, d, h, m, ʔ, L, n, f, ᵛz, ʒ̣, q, ḍ, ɣ, ᵛs, ṣ, ʃ̣, t, ṭ, ɵ, z, x, θ, H, T, K, ø/

c) The identity and distinctive function of /ʕ/ are established by the following comparisons:

1. ʕ/b see: b.16.
2. ʕ/f see: f. 16.
3. ʕ/m see: m. 16.
4. ʕ/t see: t. 16.
5. ʕ/ṭ see: ṭ. 16.
6. ʕ/d see: d. 16.
7. ʕ/θ see: θ. 16.
8. ʕ/ʃ see: ʃ. 16.
9. ʕ/ʃ̣ see: ʃ̣. 16.
10. ʕ/ḍ see: ḍ. 16.
11. ʕ/n see: n. 16.
12. ʕ/ᵛz see: ᵛz. 16.
13. ʕ/ᵛs see: ᵛs. 16.
14. ʕ/ʔ see: ʔ. 16.
15. ʕ/ḥ see: ḥ. 16.
16. ʕ/h see: h. 16.
17. ʕ/k /ʕAnz/ (she-goat) /kAnz/ (a treasure)
18. ʕ/q /ʕād/ (to return back) /qād/ (to lead)
19. ʕ/x /ʕāl/ (to encumber) /xāl/ (to think)
20. ʕ/ɣ /ʕāb/ (to find fault with) /ɣāb/ (to disappear)

21.	ʕ/r	/ʕām/	(to swim)	/rām/ (to wish)
22.	ʕ/s	/ʕāq/	(to delay)	/sāq/ (to drive)
23.	ʕ/z	/ʕād/	(to return back)	/zād/ (to increase)
24.	ʕ/ṣ	/ʕām/	(to swim)	/ṣām/ (to fast)
25.	ʕ/l	/ʕām/	(" ")	/lām/ (to blame)
26.	ʕ/ḷ	/uaʕʕāh/	(to collect it)	/uallāh/ (by God)
27.	ʕ/u	/sAʕb/	(difficult)	/sAub/ (direction)
28.	ʕ/i	/ʕAum/	(swimming)	/iAum/ (a day)

d) The realization of /ʕ/.

The most frequent realization of this phoneme is voiced pharyngal fricative [ʕ].

The phoneme /k/.

a) This phoneme belongs to pos. 'e', pos. 'i[1]' and pos. 'i[2]'.

b) In pos. 'e' it commutes with /s, ṣ, z, s̬, z̬, x, ɣ, h, ʕ, ḥ, ʔ, q, i, u, m, ḷ, r, l, n, d, ḍ, b, f, ɵ, ṭ, t, ɤ, ʢ /

In pos. 'i[1]' it commutes with /d, ṣ, , t, r, z, ḍ, ṭ, u, x, ʕ, b, ʔ, l, h, s, n, s̬, z̬, f, ḥ, m, ɣ, ɤ, i, q, ɵ, N, D, ʢ, X, s̬, ø/

In pos. 'i[2]' it commutes with /t, ṭ, ɤ, s, s̬, ɣ, ḍ, q, ʢ, z̬, f, n, ʕ, L, ʔ, m, h, d, h, b, r, s, ɵ, z, x, Θ, H, K, T, ø/

c) The identity and distinctive function of /k/ are established by the following comparisons:

1. k/b see: b. 17.

2. k/f see: f. 17.

3. k/m see: m. 17.

4. k/t see: t. 17.

5. k/ṭ see: ṭ. 17.

6. k/d see: d. 17.

7. k/ϑ see: ϑ. 17.

8. k/ɣ see: ɣ. 17.

9. k/ẓ see: ẓ. 17.

10. k/ḍ see: ḍ. 17.

11. k/n see: n. 17.

12. k/z̬ see: z̬. 17.

13. k/s̬ see: s̬. 17.

14. k/ʔ see: ʔ. 17.

15. k/ḥ see: ḥ. 17.

16. k/h see: h. 17.

17. k/ʕ see: ʕ. 17.

18. k/q /kāl/ (to measure) /qāl/ (to say)

19. k/x /kāl/ (" ") /xāl/ (to think)

20. k/ɣ /kArb/ (affliction) /ɣArb/ (west)

21. k/r /kād/ (to deceive) /rād/ (to explore)

22. k/s /kAlb/ (a dog) /sAlb/ (robbery)

23. k/z /kāl/ (to measure) /zāl/ (to vanish)

24. k/ṣ /kān/ (to be) /ṣān/ (to keep)

25. k/l /kān/ (" ") /lān/ (to be soft)

26. k/l̤ /uakkāh/ (to be filled) /ualllāh/ (by God)

27. k/u /rAkb/ (convoy) /rAub/ (curdled)

28. k/i /rAkb/ (") /rAib/ (doubt)

d) The realization of /k/.

This phoneme is realized as an unvoiced, non-emphatic, post-palatal, occlusive [k].

<u>The phoneme /q/</u>.

a) This phoneme belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /b, f, ɵ, ð, ð̣, ḍ, d, t, ṭ, n, š, ž, s, ṣ, z, ɣ, x, ħ, ʕ, h, ʔ, l, r, ḷ, m, u, i/

In pos. 'i^1' it commutes with /u, x, ʕ, b, ʔ, l, h, s, n, š, ž, f, ħ, m, ɣ, ð, i, θ, ṭ, d, z, r, t, ð̣, ṣ, d, X, Š, ʕ, D, N, ∅/

In pos. 'i^2' it commutes with /s, r, b, ħ, k, d, h, m, ʔ, L, ʕ, n, f, ž, š, ð̣, ḍ, ɣ, ṣ, ð, t, ṭ, ɵ, z, x, θ, K, H, T, ∅/

c) The identity and distinctive function of /q/ are established by the following comparisons:

1. q/b see: b. 18.
2. q/f see: f. 18.
3. q/m see: m. 18.
4. q/t see: t. 18.
5. q/ṭ see: ṭ. 18.
6. q/d see: d. 18.
7. q/θ see: θ. 18.
8. q/ð see: ð. 18.
9. q/ð̣ see: ð̣. 18.
10. q/ḍ see: ḍ. 18.
11. q/n see: n. 18.

12. q/$\overset{v}{z}$ see: $\overset{v}{z}$. 18.

13. q/$\overset{v}{s}$ see: $\overset{v}{s}$. 18.

14. q/ʔ see: ʔ. 18.

15. q/ḥ see: ḥ. 18.

16. q/h see: h. 18.

17. q/ʕ see: ʕ. 18.

18. q/k see: k. 18.

19.	q/x	/qāl/ (to say)	/xāl/ (to think)
20.	q/ɣ	/qār/ (tar)	/ɣār/ (to sink deeply into)
21.	q/r	/qAtL/ (killing)	/rAtL/ (line)
22.	q/s	/qāl/ (to say)	/sāl/ (to flow)
23.	q/z	/qād/ (to lead)	/zād/ (to increase)
24.	q/ṣ	/qAlb/ (a heart)	/ṣAlb/ (crucifying)
25.	q/l	/qām/ (to stand up)	/lām/ (to blame)
26.	q/l̇	/uaqqāh/ (to protect and guard him)	/ualläh/ (by God)
27.	q/u	/qAfr/ (waste)	/uAfr/ (economy)
28.	q/i	/nAqL/ (removal)	/nAiL/ (obtainment)

d) The realization of /q/

This phoneme is the emphatic counter-part of /k/. Compared with the realization of /k/, the realization of /q/ has a narrower pharyngeal aperture. Like all emphatic phonemes, it exerts a retracting influence on the adjacent phonemes; particularly on /a/ and /ā/.

The phoneme /x/.

a) This phoneme belongs to pos. 'e', pos. 'i^{1}' and pos. 'i^{2}'.

b) In pos. 'e' it commutes with /i, u, m, l̤, l, q, k, r, h, b, f, ɵ, ɔ, ɔ̤, d, t, t̤, d̤, n, s, v̤z, v̤s, z, s̤, ɤ, ħ, ʕ /

In pos. 'i^{1}' it commutes with /m, ɤ, ɔ, i, q, ɵ, t, t, d, d̤, z, r, ɔ̤, s̥, u, ʕ, b, ʔ, h, ħ, s, n, v̤s, v̤z, f, ʢ, v̤S, N, D, X, ø/

In pos. 'i^{2}' it commutes with / ɤ, v̤s, s̤, ɤ, t, ɵ, t̤, z, s, r, b, ħ, k, d, h, m, L, ʔ, ʕ, n, f, v̤z, ɔ, q, d̤, H, K, Θ, T, ø/

c) The identity and distinctive function of /x/ are established by the following comparisons:

1. x/b see: b. 19.
2. x/f see: f. 19.
3. x/m see: m. 19.
4. x/t see: t. 19.
5. x/t̤ see: t̤. 19.
6. x/d see: d. 19.
7. x/ɵ see: ɵ. 19.
8. x/ɔ see: ɔ. 19.
9. x/ɔ̤ see: ɔ̤. 19.
10. x/d̤ see: d̤. 19.
11. x/n see: n. 19.
12. x/v̤z see: v̤z. 19.
13. x/v̤s see: v̤s. 19.
14. x/ʔ see: ʔ. 19.

15. x/ħ see: ħ. 19.

16. x/h see: h. 19

17. x/ʕ see: ʕ. 19

18. x/k see: k. 19.

19. x/q see: q. 19.

20. x/ɣ /xāb/ (to fail) /ɣāb/ (to disappeare)

21. x/r /xād/ (to wade through) /rād/ (to train)

22. x/s /xāb/ (to fail) /sāb/ (to leave)

23. x/z /xāf/ (to be afraid of) /zāf/ (to counterfeit)

24. x/ṣ /xān/ (to betray) /ṣān/ (to keep)

25. x/l /xān/ (" ") /lān/ (to be soft)

26. x/l̤ /uaxxāh/(to intend him) /uallāh/ (by God)

27. x/u /xālid/ (everlasting) /uālid/ (father)

28. x/i /nAxL/ (palm trees) /nAiL/ (obtainment)

d) The realization of /x/.

The most frequent realization of this phoneme is an unvoiced velar fricative [x]. It is in free variation between unvoiced/emphatic and unvoiced/non-emphatic.

The phoneme /ɣ/.

a) This phoneme belongs to pos. 'e', pos. 'i^1' and pos. 'i^2'.

b) In pos. 'e' it commutes with /b, f, ɣ, ɣ̣, t, ṭ, d, ḍ, n, s, ṣ, ᵛz, ᵛṣ, z, ħ, ʕ, h, ʔ, l, l̤, q, k, x, m, u, i, r, ɵ/

In pos. 'i^1' it commutes with /u, ʕ, b, ʔ, l, h, s, n, ᵛṣ, ᵛz, f, ħ, m, ɣ̣, i, q, ɵ, ṭ, ḍ, z, r, t, ɣ, ṣ, d, x, k, X, N, D, ᵛŠ, ʕ̣, ø/

In pos. 'i^2' it commutes with /s, r, b, h, k, d, h, m, ?, L, ʕ, n, f, $\overset{v}{z}$, ʒ̣, q, d̤, $\overset{v}{s}$, s̤, ʃ̣, t, t̤, ɵ, z, x, θ, T, H, K, ø/

c) The identity and distinctive function of /ʃ/ are established by the following comparisons:

1. ʃ/b see: b. 20.
2. ʃ/f see: f. 20.
3. ʃ/m see: m. 20.
4. ʃ/t see: t. 20.
5. ʃ/t see: t̤. 20.
6. ʃ/d see: d. 20.
7. ʃ/θ see: θ. 20.
8. ʃ/ʃ see: ʃ. 20.
9. ʃ/ʃ̣ see: ʃ̣. 20.
10. ʃ/d̤ see: d̤. 20.
11. ʃ/n see: n. 20.
12. ʃ/$\overset{v}{z}$ see: $\overset{v}{z}$. 20.
13. ʃ/$\overset{v}{s}$ see: $\overset{v}{s}$. 20.
14. ʃ/? see: ?. 20.
15. ʃ/ħ see: ħ. 20.
16. ʃ/h see: h. 20.
17. ʃ/ʕ see: ʕ. 20.
18. ʃ/k see: k. 20.
19. ʃ/q see: q. 20.
20. ʃ/x see: x. 20.
21. ʃ/r /ʃāb/ (to disappear) /rāb/ (to curdle 'milk')
22. ʃ/s /ʃār/ (to sink deeply into) /sār/ (to walk)

23.	ɣ/z	/ɣār/	(to sink deeply into)	/zār/	(to visit)
24.	ɣ/ṣ	/ɣāb/	(to disappear)	/ṣāb/	(to hit the mark)
25.	ɣ/l	/ɣāṣ/	(to dive)	/lāṣ/	(to peep)
26.	ɣ/ḷ	--------------------			
27.	ɣ/u	/bAɣL/	(mule)	/bAuL/	(urine)
28.	ɣ/i	/nAɣL/	(bastard)	/nAiL/	(obtainment)

d) The realization of /ɣ/

This phoneme is realized as a voiced post-palatal fricative [ɣ]. It freely oscillates between voiced/emphatic and voiced/non-emphatic without being governed by an emphatic vicinity. The realization of /ɣāb/ (he disappeared) is in free variation between [ɣ̱a: b] and [ɣa: b]. The phoneme /ɣ/ can have a pharyngalization effect on the adjacent vowels when it is itself pharyngalized; on /a/ and /ā/ in particular.

The phoneme /r/.

a) This phoneme belongs to pos. 'e', pos. 'i[1]' and pos. 'i[2]'.

b) In pos. 'e' it commutes with /k, q, ḷ, l, m, u, i, b, f, θ, ð, ð̣, d, ḍ, t, ṭ, n, s, ṣ, z, ž, š, x, ɣ, ħ, ʕ, h, ʔ/

In pos. 'i[1]' it commutes with /z, t, k, ð̣, ṣ, d, u, x, ʕ, b, ʔ, l, h, s, n, š, ž, f, ħ, m, ɣ, ð, i, q, θ, ṭ, ḍ, ʢ, D, X, N, Š, ∅/

In pos. 'i[2]' it commutes with /x, z, θ, t, ṭ, ð, ṣ, š, s, ž, ɣ, ḍ, q, ð̣, f, n, ʕ, L, ʔ, m, h, d, k, ħ, b, s, K, T, H, Θ, ∅/

c) The identity and distinctive function of /r/ are established by the following comparisons:

1. r/b see: b. 21.
2. r/f see: f. 21.
3. r/m see: m. 21.
4. r/t see: t. 21.
5. r/ṭ see: ṭ. 21.
6. r/d see: d. 21.
7. r/ϑ see: ϑ. 21.
8. r/ᵛz see: ᵛz. 21.
9. r/ẓ see: ẓ. 21.
10. r/ḍ see: ḍ. 21.
11. r/n see: n. 21.
12. s/ᵛz see: ᵛz. 21.
13. r/ᵛs see: ᵛs. 21.
14. r/ʔ see: ʔ. 21.
15. r/ḥ see: ḥ. 21.
16. r/h see: h. 21.
17. r/ʕ see: ʕ. 21.
18. r/k see: k. 21.
19. r/q see: q. 21.
20. r/x see: x. 21.
21. r/ɣ see: ɣ. 21.
22. r/s /rāb/ (to curdle 'milk') /sāb/ (to leave)
23. r/z /rāḥ/ (to go away) /zāḥ/ (to remove)
24. r/ṣ /rād/ (to explore) /ṣād/ (to hunt)
25. r/l /rām/ (to wish) /lām/ (to blame)
26. r/l̤ /uarrāh/(to hide it) /ualllāh/ (by God)

27. r/u /dArs/ (obliteration) /dAus/ (tread)

28. r/i /ṭArf/ (edge) /ṭAif/ (phantom)

d) The realization of /r/

The most common realization of this phoneme is a voiced alveolor trill [r]. It is in free variation between emphatic and non-emphatic, but the most common realization is emphatic. When it is realized as emphatic, it is noticed that it starts to exert a retracting influence on the adjacent vowels; on /a/ and /ā/ in particular. In stressed mono-syllabic words, the realization of /a/ sounds like [ʌ] when it is followed or proceeded by an emphatic realization of /r/. A form like /far/ (he escaped) is realized as [fʌrr]; /rab/ (God) is realized as [rʌbb].

The phoneme /s/.

a) This phoneme belongs to pos. 'e', pos. 'i^{1}' and pos. 'i^{2}'.

b) In pos. 'e' it commutes with /d, ḍ, n, ṣ, z, v̈s, v̈z, x, ɤ, ḥ, ʕ, h, ʔ, k, q, l, r, ḷ, m, u, i, b, f, ɵ, ɤ̣, x̣ /

In pos. 'i^{1}' it commutes with /f, h, m, ɤ, ɤ̣, i, q, ɵ, ṭ, ḍ, z, r, t, k, x̣, ṣ, d, u, x, ʕ, b, ʔ, l, ḥ, n, v̈s, v̈z, N, X, v̈S, D, ʢ, ø/

In pos. 'i^{2}' it commutes with /ʕ, n, f, v̈z, x̣, q, ḍ, ɤ, v̈s, s, ɤ̣, t, ṭ, ɵ, z, x, r, b, h, k, d, ḥ, m, ʔ, L, H, T, Θ, K, ø/

c) The identity and distinctive function of /s/ are established by the following comparisons:

1. s/b see: b. 22.

2. s/f see: f. 22.

3. s/m see: m. 22.

4. s/t see: t. 22.

5. s/ṭ see: ṭ. 22.

6. s/d see: d. 22.

7. s/ϑ see: ϑ. 22.

8. s/ʒ see: ʒ. 22.

9. s/ʒ̣ see: ʒ̣. 22.

10. s/ḍ see: ḍ. 22.

11. s/n see: n. 22.

12. s/z^{v} see: z^{v}. 22.

13. s/s^{v} see: s^{v}. 22.

14. s/ʔ see: ʔ. 22.

15. s/ħ see: ħ. 22.

16. s/ḥ see: ḥ. 22.

18. s/k see: k. 22.

19. s/q see: q. 22.

20. s/x see: x. 22.

21. s/ɣ see: ɣ. 22.

22. s/r see: r. 22.

23. s/z /sār/ (to walk) /zār/ (to visit)

24. s/ṣ /sāh/ (to flow) /ṣāh/ (to shout)

25. s/l /sāh/ (" ") /lāh/ (to appear)

26. s/l̤ /uassāh/ (to share him) /ual̤lāh/ (by God)

27. s/u /hAsm/ (settlement) /hAum/ (hovering)

28. s/i /nAsL/ (descendants) /nAiL/ (obtainment)

d) The realization of /s/

This phoneme is realized as an unvoiced alveolar fricative [s].

It is liable to pharyngalization in the vicinity of emphatics. Thus, the realization of /sAṯḥ/ (roof) is [saṯḥ].

The phoneme /z/.

a) This phoneme belongs to pos. 'e', pos. 'i[1]' and pos. 'i[2]'.

b) In pos. 'e' it commutes with /t, ṯ, n, s, ṣ, v̇z, d, ḍ, v̇s, x, ɤ, ḥ, ʕ, h, ʔ, k, q, l, r, ḷ, i, u, m, ʁ, ɣ̣, ɵ, f, b/

In pos. 'i[1]' it commutes with /s, n, v̇s, v̇z, f, h, m, ɤ, ʁ, i, q, ɵ, ṯ, ḍ, r, t, k, ɣ̣, ṣ, d, ḥ, l, ʔ, u, x, ʕ, b, X, N, ʢ, v̇š, D, ø/

In pos. 'i[2]' it commutes with /ʕ, n, f, v̇z, ɣ̣, q, ḍ, ɤ, v̇s, s, ʁ, t, ṯ, ɵ, x, ʔ, m, h, d, k, ḥ, b, s, r, H, T, Θ, L, K, ø/

c) The identity and distinctive function of /z/ are established by the following comparisons:

1. z/b see: b. 23.
2. z/f see: f. 23.
3. z/m see: m. 23.
4. z/t see: t. 23.
5. z/ṯ see: ṯ. 23.
6. z/d see: d. 23.
7. z/Θ see: Θ. 23.
8. z/ʁ see: ʁ. 23.
9. z/ɣ̣ see: ɣ̣. 23.
10. z/ḍ see: ḍ. 23.
11. z/n see: n. 23.
12. z/v̇z see: v̇z. 23.
13. z/v̇s see: v̇s. 23.

14. z/ʔ see: ʔ. 23.

15. z/ħ see: ħ. 23.

16. z/h see: h. 23.

17. z/ʕ see: ʕ. 23.

18. z/k see: k. 23.

19. z/q see: q. 23.

20. z/x see: x. 23.

21. z/ɣ see: ɣ. 23.

22. z/r see: r. 23.

23. z/s see: s. 23.

24. z/ṣ /zāh/ (to remove) /ṣāh/ (to shout)

25. z/l /zāh/ (" ") /lāh/ (to appear)

26. z/ḷ /uazzāh/ (to make him angry) /uallāh/ (by God)

27. z/u /ʕAzm/ (resolution) /ʔAum/ (swimming)

28. z/i /ʕAzm/ (") /ʔAin/ (eye)

d) The realization of /z/.

This phoneme is realized as a voiced alveolar fricative [z]. It does not appear to be influenced by emphatics.

The phoneme /ṣ/.

a) This phoneme belongs to pos. 'e', pos. 'i[1]' and pos. 'i[2]'.

b) In pos. 'e' it commutes with /s̬, z̬, x, ɣ, ħ, ʕ, h, ʔ, k, q, l, r, ḷ, m, u, i, b, f, ɵ, ɣ̣, d, t, ṭ, ḍ, ṭ, n, s, z/

In pos. 'i[1]' it commutes with /m, ɣ, ɣ̣, i, q, ɵ, ṭ, d, z, r, t, k, ṭ, d, u, x, ʕ, b, ʔ, l, h, s, n, s̬, z̬, f, ħ, X, N, ʕ̣, Š, D, ø/

In pos. 'i^2' it commutes with /ð̣, q, ḍ, ɣ, š, ð, t, ṭ, θ, z, x, s, r, b, h, k, d, ħ, m, ʔ, ʕ, n, f, ž, T, L, θ, K, H, ∅/

c) The identity and distinctive function of /ṣ/ are established by the following comparisons:

1. ṣ/b see: b. 24.
2. ṣ/f see: f. 24.
3. ṣ/m see: m. 24.
4. ṣ/t see: t. 24.
5. ṣ/ṭ see: ṭ. 24.
6. ṣ/d see: d. 24.
7. ṣ/θ see: θ. 24.
8. ṣ/ð see: ð. 24.
9. ṣ/ð̣ see: ð̣. 24.
10. ṣ/ḍ see: ḍ. 24.
11. ṣ/n see: n. 24.
12. ṣ/ž see: ž. 24.
13. ṣ/š see: š. 24.
14. ṣ/ʔ see: ʔ. 24.
15. ṣ/ħ see: ħ. 24.
16. ṣ/h see: h. 24.
17. ṣ/ʕ see: ʕ. 24.
18. ṣ/k see: k. 24.
19. ṣ/q see: q. 24.
20. ṣ/x see: x. 24.
21. ṣ/ɣ see: ɣ. 24.
22. ṣ/r see: r. 24.

23. ṣ/s see: s. 24.

24. ṣ/z see: z. 24.

25. ṣ/l /ṣān/ (to keep) /lān/ (to be soft)

26. ṣ/l /uaṣṣāh/(torecommend him) /uallāh/ (by God)

27. ṣ/u /nAṣb/ (raising) /nAum/ (sleeping)

28. ṣ/i /ṣAum/ (fasting) /iAum/ (a day)

d) The realization of /ṣ/

This phoneme is the emphatic counterpart of /s/. It always exerts a retracting influence on the adjacent phonemes and particularly, on /a/ and /ā/. When a retracted [a:] is produced, it is noticed that such a retracted vowel, in its turn, starts to exert a pharyngalized influence on the following or preceding phonemes. In the realization of /ṣām/(he fasted) [ṣa:m] and /sām/ (poisonous) [sa:m] , one can clearly notice the difference between the former [a:] and the latter one.

The phoneme /l/.

a) This phoneme belongs to pos. 'e', pos. 'i^{1}' and pos. 'i^{2}'.

b) In pos. 'e' it commutes with /s, ṣ, z, s̬, z̬, x, ɣ , ħ, ʕ , h, ʔ, k, q, r, l, m, u, i, b, f, ɵ, ɣ , ɣ , t, ṭ, d, ḍ, n/

In pos. 'i^{1}' it commutes with /f, h, m, ɣ , ɣ , i, q, ɵ, ṭ, ḍ, z, r, t, k, ɣ , ṣ, d, u, x, ʕ , b, ʔ, z̬, ħ, s, n, s̬, X, N, ʢ , S̬, D, ø/

In pos. 'i^{2}' it commutes with / ʃ , n, f, z̬, ɣ , q, ḍ, ɣ , s̬, s, ɣ , t, ṭ, ɵ, z, x, s, r, b, h, k, d, ħ, m, ʔ, L, K, H, T, Θ, ø/

c) The identity and distinctive function of /l/ are established by the following comparisons:

1. l/b see: b. 25.
2. l/f see: f. 25.
3. l/m see: m. 25.
4. l/t see: t. 25.
5. l/ṭ see: ṭ. 25.
6. l/d see: d. 25.
7. l/θ see: θ. 25.
8. l/ʒ see: ʒ. 25.
9. l/ʒ̣ see: ʒ̣. 25.
10. l/ḍ see: ḍ. 25.
11. l/n see: n. 25.
12. l/z̬ see: z̬. 25.
13. l/s̬ see: s̬. 25.
14. l/ʔ see: ʔ. 25.
15. l/ħ see: ħ. 25.
16. l/h see: h. 25.
17. l/ʕ see: ʕ. 25.
18. l/k see: k. 25.
19. l/q see: q. 25.
20. l/x see: x. 25.
21. l/ɣ see: ɣ. 25.
22. l/r see: r. 25.
23. l/s see: s. 25.
24. l/z see: z. 25.

25. l/ṣ see: s. 25.

26. l/ḷ /uallāh/ (to appoint him as a ruler) /uallāh/ (by God)

27. l/u /lAhm/ (to swallow up) /uAhm/ (to imagine)

28. l/i /lAum/ (blaming) /iAum/ (a day)

d) The realization of /l/.

The most frequent realization of this phoneme is a voiced alveolar lateral [l]. It is liable to pharyngalization in the vicinity of emphatics.

The phoneme /ḷ/.

a) This phoneme belongs to pos. 'e' and pos. 'I'.

b) In pos. 'e' it commutes with /x, ɣ, ħ, ʕ, h, ʔ, k, q, b, f, ɵ, ʃ, ʂ, t, ṭ, d, ḍ, s, ṣ, z, v̈z, v̈s, r, l, m, u, i/

In pos. 'I' it commutes with /ø/.

c) The identity and distinctive function of /ḷ/ are established by the following comparisons:

1. ḷ/b see: b. 25.

2. ḷ/f see: f. 26.

3. ḷ/m ----------

4. ḷ/t ----------

5. ḷ/ṭ see: ṭ. 26.

6. ḷ/d ----------

7. ḷ/ɵ ----------

8. ḷ/ɣ ----------

9. l/ɣ̣ ----------

10. l/d̪ ----------

11. l/n see: n. 26.

12. l/z̪ˠ ----------

13. l/s̪ˠ see: s̪ˠ. 26.

14. l/ʔ ----------

15. l/ħ̣ see: ħ̣. 26.

16. l/h ----------

17. l/ʕ̣ see: ʕ̣. 26.

18. l/k see: k. 26.

19. l/q see: q. 26.

20. l/x see: x. 26.

21. l/ɣ ----------

22. l/r see: r. 26.

23. l/s see: s. 26.

24. l/z see: z. 26.

25. l/s̪ see: s̪. 26.

26. l/l see: l. 26.

27. l/u ----------

28. l/i ----------

29. l/ø /ual/ (indirectly attested form) /uaø/ (and)

d) The realization of /l̪/

This phoneme is always realized as a voiced <u>dark</u> velarized lateral [l̪]. It exerts a retracting influence on /a/ and /ā/. In phonology the occurrance of this phoneme is very restricted. In phonetics, it is frequently noticed in the vicinity of emphatic phonemes.

The phoneme /u/.

a) This phoneme belongs to pos. 'e', pos. 'n' and pos. 'i[1]'.

b) In pos. 'e' it commutes with /b, f, ɵ, ɣ, ɣ̣, ʕ, h, ʔ, k, q, t, ṭ, s, ṣ, z, d, ḍ, x, ɣ, ḥ, l, r, ḷ, m, i/

In pos. 'n' it commutes with /a, ā, ū, i, ī/

In pos. 'i[1]' it commutes with /x, ʕ, b, ʔ, h, l, s, n, s̬, z̬, f, ḥ, m, ɣ, ɣ, i, q, ɵ, ṭ, d, z, r, t, k, ɣ̣, ṣ, d, N, X, ʕ̣, S̬, D, ø/

c) The identity and distinctive function of /u/ are established by the following comparisons:

1. u/b see: b. 27.
2. u/f see: f. 27.
3. u/m see: m. 27.
4. u/t see: t. 27.
5. u/ṭ see: ṭ. 27.
6. u/d see: d. 27.
7. u/ɵ see: ɵ. 27.
8. u/ɣ see: ɣ. 27.
9. u/ɣ̣ see: ɣ̣. 27.
10. u/ḍ see: ḍ. 27.
11. u/n see: n. 27.
12. u/z̬ see: z̬. 27.
13. u/s̬ see: s̬. 27.
14. u/ʔ see: ʔ. 27.
15. u/ḥ see: ḥ. 27.
16. u/h see: h. 27.
17. u/ʕ see: ʕ. 27.

18. u/k see: k. 27.

19. u/q see: q. 27.

20. u/x see: s. 27.

21. u/ɣ see: ɣ. 27.

22. u/r see: r. 27.

23. u/s see: s. 27.

24. u/z see: z. 27.

25. u/ṣ see: ṣ. 27.

26. u/l see: l. 27.

27. u/l̤ ----------

28. u/i /t̤Aur/ (stage) /tAir/ (bird)

d) The realization of /u/.

In explosive and first implosive positions, the phoneme /u/ is realized as a bilateral fricative [w], as in forms like /uArd/, [ward] (flowers), /zAur/ [zawr] (throat). In nuclear position the realization of /u/ is a rounded back close [u].

The phoneme /i/.

a) This phoneme belongs to pos. 'e', pos. 'n' and pos. 'i^{1}'.

b) In pos. 'e' it commutes with /l, q, k, ʔ, h, ʕ, ḥ, ɣ, x, v̈z, v̈s, z, ṣ, s, n, d, d̤, t, t̤, ɤ, ɤ̤, ɵ, f, b, r, l, m, u/

In pos. 'n' it commutes with /a, ā, ū, i, ī/

In pos. 'i^{1}' it commutes with /k, t, r, z, d, t, ɵ, q, ɤ, ɣ, m, ḥ, f, v̈z, v̈s, n, s, h, l, ʔ, b, ʕ, x, u, ɤ̤, ṣ, d, N, D, X, ʕ̈, v̈S, ø/

c) The identity and distinctive function of /i/ are established by the following comparisons.

1. i/b see: b. 28.
2. i/f see: f. 28.
3. i/m see: m. 28.
4. i/t see: t. 28.
5. i/ṭ see: ṭ. 28.
6. i/d see: d. 28.
7. i/θ see: θ. 28.
8. i/ʒ see: ʒ. 28.
9. i/ʒ̣ see: ʒ̣. 28.
10. i/ḍ see: ḍ. 28.
11. i/n see: n. 28.
12. i/z̬ see: z̬. 28.
13. i/s̬ see: s̬. 28.
14. i/ʔ see: ʔ. 28.
15. i/ḥ see: ḥ. 28.
16. i/h see: h. 28.
17. i/ʕ see: ʕ. 28.
18. i/k see: k. 28.
19. i/q see: q. 28.
20. i/x see: x. 28.
21. i/ɣ see: ɣ. 28.
22. i/r see: r. 28.
23. i/s see: s. 28.
24. i/z see: z. 28.

25. i/ṣ see: ṣ. 28.

26. i/l see: l. 28.

27. i/l̤ ----------

28. i/u see: u. 28.

The realization of /i/

In explosive and first implosive positions, the phoneme /i/ is realized as post-alveolar fricative [j], e.g. /iad/ [jad] (hand), /sAif/ [sajf] (sword). In nuclear position, it is realized as a short front close [i].

CHAPTER VI.

Neutralization and the Consonantal Archiphonemes.

As we saw in our discussion in (3.2.3), neutralisation is the suspension of opposition between two or more phonemes in a specific and constant context. The entity which results from such a neutralisation is called an"archiphoneme", and that any such entity is a phoneme in its own right, despite the fact that it is restricted in occurence to contexts where the neutralisation takes place.

The following archi-phonemes are established for Modern Standard Arabic.

1. /K/ representing the suspension of the opposition between /k/ and /q/.
2. /L/ representing the suspension of the opposition between /l/ and /l̤/.
3. /D/ representing the suspension of the opposition between /t̤/ and /d̤/.
4. /X/ representing the suspension of the opposition between /x/ and /x̣/.
5. /Ḥ/ representing the suspension of the opposition between /ḥ/ and /ʕ/.
6. /N/ representing the suspension of the opposition between /n/ and /m/.
7. /H/ representing the suspension of the opposition between /ʔ/ and /h/.
8. /S̬/ representing the suspension of the opposition between /s̬/ and /z̬/.
9. /θ/ representing the suspension of the opposition between /ɵ/, /ʒ/ and /ʒ̣/.
10. /T/ representing the suspension of the opposition between /t/, /t̤/ and /d/.

From the above examples, it appears that there are five types of neutralisation in Modern Standard Arabic:

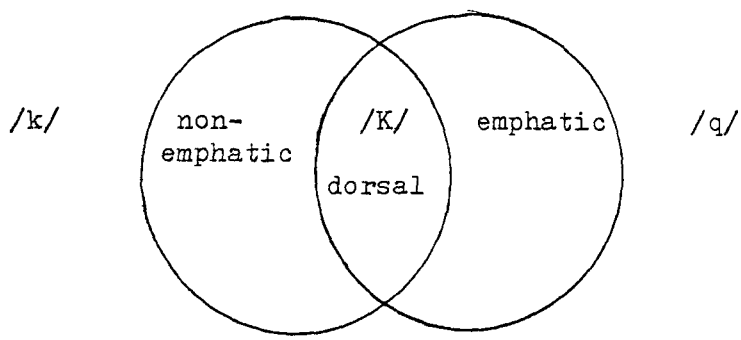
1. The non-emphatic ~ emphatic neutralisation.
2. The voiced ~ unvoiced neutralisation.
3. The nasal neutralisation.
4. The occlusive ~ fricative neutralisation.
5. The double neutralisation.

1) The Non-emphatic ~ Emphatic Neutralisation.

In certain contexts the /non-emphatic ~ emphatic/ opposition is neutralised in the pairs of phonemes /k/~/q/, and /l/~ /l̪/ which are tabulated in the same scheme in our discussion of the consonantal phonemes of Modern Standard Arabic (see Chapter V section 1).

The neutralisation of the opposition/non-emphatic ~ emphatic/ between /k/ and /q/ takes place in pos. 'i^{2}' when pos. 'i^{1}' is filled by a 'hissing' phoneme, i.e. either /s/, /s̪/ or /z/. The archi-phoneme which results from this neutralisation is represented by /K/ e.g. /mAzK/ "tearing off". Whether /K/ is /non-emphatic/ or /emphatic/ is not functionally relevant, as, in this context, we are unable to establish a functional opposition between the 'non-emphatic' /k/ and the 'emphatic' /q/. As far as the above example is concerned, we cannot establish a phoneme /q/ in */mAzq/ because in the absence of the 'non-emphatic' /k/ to which /q/ might be opposed, /q/ cannot be shown to be an 'emphatic' phoneme. This means that the only feature which is relevant for this archi-phoneme is the feature /dorsal/, i.e. it is a simultaneous bundle

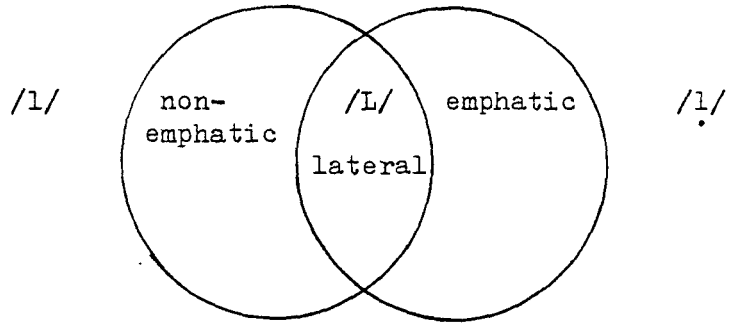
of one distinctive feature only. This archi-phoneme is 'dorsal' by being opposed to 'lateral', 'apical', etc..., and it is represented in the overall system by the (non-emphatic, dorsal) /k/ and the (emphatic, dorsal) /q/; this follows from the view that an archi-phoneme is a subset of its terms, and is, therefore, said to be included in each of its terms. The archi-phoneme /K/ can be represented by the following Venn diagram wherein the intersection represents the feature which is relevant for its identity:



(fig. 1)

The /non-emphatic ~ emphatic/ neutralisation between /l/ and /l̤/ takes place in 'pos. i^2' if and only if 'pos. i^1' is filled by a phoneme of the following types: 'labial','apical', 'hushing', 'glottal', 'hissing', 'velar', 'pharyngal', 'dorsal' or the phoneme /r/. The archi-phoneme which results from this neutralisation is symbolized by /L/, e.g. /nAmL/ "ants", and is represented in the overall system by the (non-emphatic, lateral) /l/ and the (emphatic, lateral) /l̤/. This archi-phoneme has the distinctive feature /lateral/, as, in this context, whether /L/ is /non-emphatic/ or /emphatic/ is of no functional value due to the fact that we are unable to establish a functional opposition between the 'non-emphatic' /l/ and the 'emphatic' /l̤/. The archi-phoneme /L/

can be illustrated by the following diagram:



(fig. 2)

2) The Voiced ~ Unvoiced Neutralisation.

In certain contexts the opposition /voiced ~ unvoiced/ is neutralised in the pairs of phonemes /d̤/ ~ /t̤/, /ɣ/ ~ /x/ and /ʕ/ ~ /ḥ/.

The opposition /voiced ~ unvoiced/ between the phonemes /d̤/ and /t̤/ is suspended in 'pos. i^1' when 'pos. i^2' is filled by a 'dorsal', an 'apical', a 'hissing', a 'glottal' or a 'pharyngal' phoneme. The archi-phoneme which results from this neutralisation is represented by /D/, e.g. /ʔADs/ "sneezing".(1) Whether /D/ is 'voiced' or 'unvoiced' is of no functional value, as we are unable, in this context, to establish a functional opposition between the 'voiced' /d̤/ and the 'unvoiced' /t̤/. As far as the above example is concerned, we cannot establish a phoneme /t̤/ in */ʔAt̤s/ because in the absence of the 'voiced' /d̤/ to which /t̤/ might be opposed, /t̤/ cannot be shown to be 'unvoiced'. This means that the only features which are relevant for this archi-phoneme are /apical, emphatic, occlusive/. The feature 'apical' is opposed to

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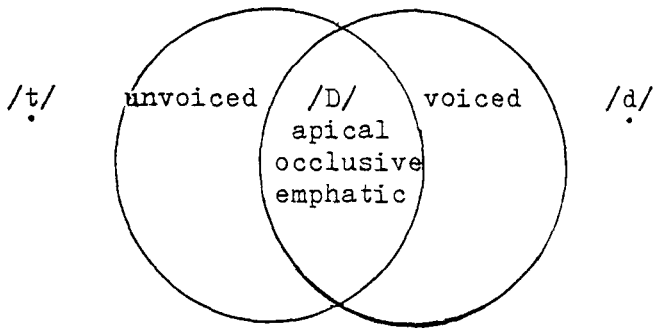
(1) The realisations of this and other archi-phonemes established in this chapter is given in page 118.

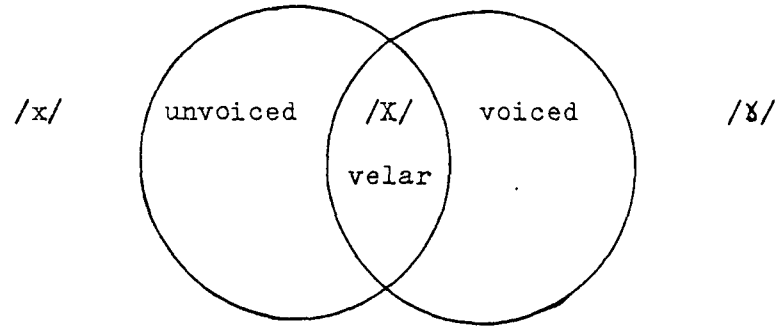
'labial','hushing','glottal'; the feature 'emphatic', is opposed to 'non-emphatic', and the feature 'occlusive' is opposed to the features 'fricative' and 'nasal'. The archi-phoneme /D/ is represented in the overall system by the phoneme /ṭ/ which has the features /apical, occlusive, unvoiced, emphatic/ and the phoneme /ḍ/ which has the features /apical, occlusive, voiced, emphatic/. This neutralisation can be represented by the following diagram:



(fig. 3)

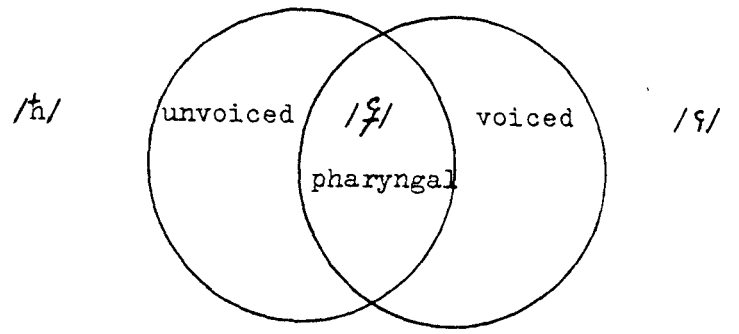
The opposition /voiced ~ unvoiced/ between the phonemes /ɣ/ and /x/ is suspended in 'pos. $i^{(1)}$' when pos. $i^{(2)}$' is filled by an 'apical' a 'hissing' or a 'hushing occlusive' phoneme. The archi-phoneme which results from this neutralisation is represented by /X/, e.g. /naXs/ "pricking". Whether this archi-phoneme is 'voiced' or 'unvoiced' is not functionally relevant, as in the context specified above we are unable to establish a functional opposition between the 'voiced' /ɣ/ and the'unvoiced'/x/. In the above example we cannot establish a phoneme /x/ because in the absence of the 'voiced' /ɣ/ to which /x/ might be opposed, /x/ cannot be shown to be 'unvoiced'. The archi-phoneme /X/ is, therefore, a simultaneous bundle of one feature -

/velar/ and is represented in the overall system by the phoneme /ɣ/ which is /velar, voiced/, and the phoneme /x/ which is /velar, unvoiced/. This neutralisation can be represented by the following diagram:



(fig. 4)

The opposition /voiced ~ unvoiced/ between the phonemes /ʕ/ and /ħ/ is suspended in 'pos. $i^{(1)}$' when pos. $i^{(2)}$, is filled by an 'apical' or 'hushing' fricative. The archiphoneme which results from this neutralisation is represented by /Ꜥ/, e.g. /nAꜤ$\overset{v}{s}$/ "bier". Whether this archiphoneme is 'voiced' or 'unvoiced' is not functionally relevant, as in the context specified above we are unable to establish a functional opposition between the 'voiced' /ʕ/ and the 'unvoiced' /ħ/. The archiphoneme /Ꜥ/ is, therefore, a simultaneous bundle of the feature /pharyngal/. It is represented in the overall system by the phoneme /ʕ/ which has the features /voiced, pharyngal/, and the phoneme /ħ/ which has the features /unvoiced, pharyngal/. The following diagram represents the neutralisation under consideration here:



(fig. 5)

3) The Nasal Neutralisation.

The opposition /labial ~ apical/[1] between the nasal phonemes /m/ and /n/ is suspended in 'pos. i[1]' when 'pos. i[2]' is filled by a 'labial' phoneme, i.e. either /b/ or /f/. The archi-phoneme which results from this neutralisation is represented by /N/ e.g. /ǯANb/ "side". Whether this archi-phoneme is /labial/ or /apical/ is not functionally relevant, as in the context in question we are unable to establish a functional opposition between the phoneme /m/, which has the features /labial/, /nasal/, and the phoneme /n/ which has the features /apical/, /nasal/. This means that the archi-phoneme /N/ has the feature /nasal/ only. In the overall system this archiphoneme is represented by /m/ and /n/ which, as mentioned above, have the features /labial/, /nasal/ and /apical/, /nasal/, respectively. This neutralisation is represented

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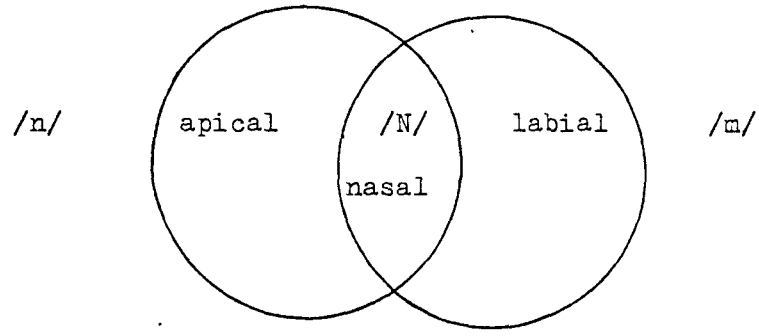
(1) Because this neutralisation is between nasal phonemes, we may call it a nasal neutralisation.

by the following diagram:



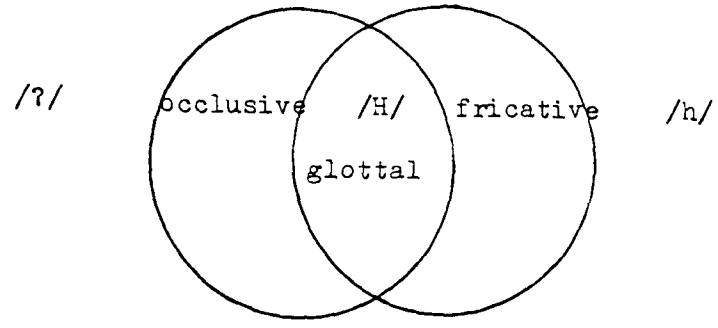
(fig. 6)

4) The Occlusive ~ Fricative Neutralisation.

In certain contexts, the opposition /occlusive ~ fricative/ is neutralised between the members of the following pairs of phonemes /ʔ/ ~ /h/, and /$^{v}_{z}$/ ~ /$^{v}_{s}$/.

As far as the phonemes /ʔ/ and /h/ are concerned the opposition /occlusive ~ fricative/ between them is neutralised in 'pos. $i^{(2)}$', when 'pos. $i^{(1)}$' is filled by an 'apical' except /d/, a 'hushing', a 'hissing unvoiced' or a 'dorsal' /q/. The archi-phoneme which results from the neutralisation of this opposition is represented by /H/, e.g. /ʔAtH/ "idiocy". Whether this archi-phoneme is 'occlusive' or 'fricative' is not functionally relevant, as in the context specified above it is not possible to establish a functional opposition between the /ʔ/, which has the features /occlusive/, /glottal/, and the phoneme /h/, which has the features /fricative/, /glottal/. Accordingly, the archi-phoneme /H/ has one constituent distinctive feature only, namely the feature /glottal/. In the overall system the archi-phoneme /H/ is represented by /ʔ/ and /h/. This neutralisation is represented by

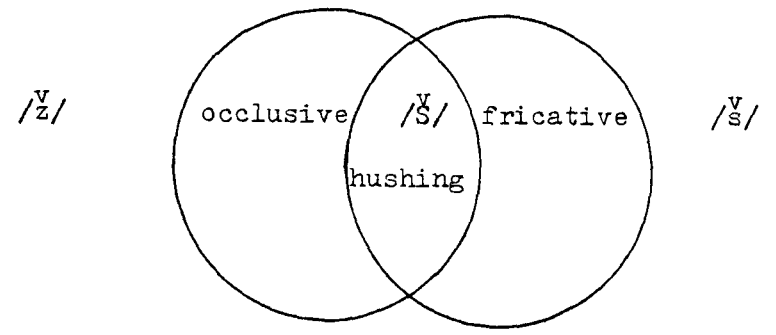
the following diagram:



(fig.7)

The opposition /occlusive ~ fricative/ between the phonemes /$\overset{v}{z}$/ and /$\overset{v}{s}$/ is suspended in 'pos. $i^{(1)}$' when 'pos. $i^{(2)}$' is filled by an 'apical', a 'dorsal', a 'hissing', a 'velar', or a 'glottal fricative' phoneme, i.e. /h/. The archi-phoneme which results from this neutralisation is represented by /$\overset{v}{S}$/, e.g. /nA$\overset{v}{S}$s/ "dirty". Whether this archi-phoneme is /occlusive/ or /fricative/ is not functionally relevant, as in the context specified above it is not possible to establish a functional opposition between the phoneme /$\overset{v}{z}$/, which has the features /hushing/, /occlusive/, and the phoneme /$\overset{v}{s}$/, which has the features /hushing/, /fricative/. The archi-phoneme /$\overset{v}{S}$/ has, therefore, one distinctive feature, namely the feature /hushing/. In the overall system this phoneme is represented by /$\overset{v}{z}$/ and /$\overset{v}{s}$/. The following diagram

represents this neutralisation:



(fig. 8)

5) The Double Neutralisation.(1)

The phonemes /ʒ̣/ and /ʒ/ are opposed to each other by the features /emphatic ~ non-emphatic/, respectively. They are opposed to the phoneme /ɵ/ by the features /voiced ~ unvoiced/. The opposition between these three phonemes is suspended in 'pos. i(2)' when 'pos. i(1)' is filled by a 'glottal', a 'pharyngal voiced,' or the phoneme /r/. The archi-phoneme which results from this neutralisation is symbolised by /Θ/, e.g. /lAhΘ/ "state of being out of breath". The archi-phoneme /Θ/ represents the suspension of the opposition /emphatic ~ non-emphatic/ in respect to the phonemes /ʒ̣/ and /ʒ/, on the one hand, and the suspension of the opposition (voiced ~ unvoiced) between these two phonemes and /ɵ/ on the other. This archi-phoneme has the features

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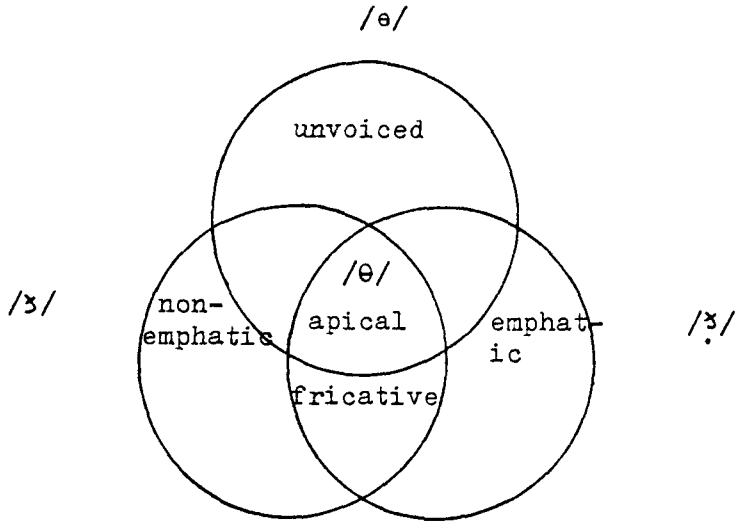
(1) A neutralization which involves the suspension of opposition between two or more dimensions is referred to as 'double neutralisation.'

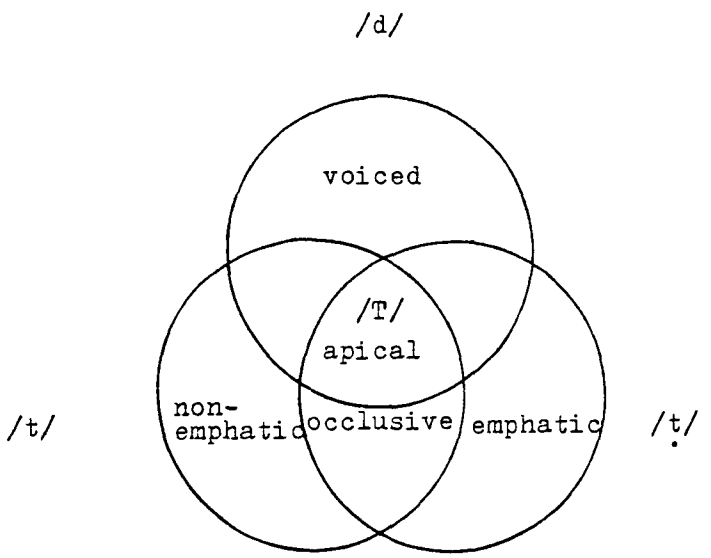
/apical/, /fricative/ which derive their identity from being opposed to 'labial', 'hushing', 'glottal', etc... and 'occlusive', 'nasal', respectively. Whether /ɵ/ is 'emphatic' or 'non-emphatic', 'voiced' or 'unvoiced' is not functionally relevant. This archi-phoneme is represented by the phonemes /s̤/ and /s/ and /ɵ/ in the overall system. The following diagram represents this neutralisation:



(fig. 9)

In a similar manner, the opposition /emphatic ~ non-emphatic/ between the phonemes /t̤/ and /t/, on the one hand, and the opposition /unvoiced ~ voiced/ between these two phonemes and the phoneme /d/, on the other, is suspended in 'pos. $i^{(2)}$, when 'pos. $i^{(1)}$' is filled by

a 'hissing', a 'hushing', a 'pharyngal voiced', or a 'nasal' /n/. The archi-phoneme which results from this neutralisation is represented by /T/, e.g. /nAʕT/ (qualification). This archi-phoneme has the features /apical/, /occlusive/ which derive their identity from being opposed to 'labial', 'hushing', etc., and 'fricative', 'nasal', respectively. It is also represented in the overall system by the phonemes /ṭ/, /t/ and /d/, as the following diagram illustrates:



(fig. 10)

The archiphoneme /K/.

a) This archiphoneme belongs to pos. 'i^{2}'

b) It commutes with /b, f, m, d̤, d, T, ɵ, H, L, ẖ, n, v̤z, v̤s, ʕ, r, x, ɣ, ɣ̤, ɤ, ɵ, t̤, t, ʔ, h, l, s, s̤, z, ø/

c) The identity and distinctive function of /K/ are established by the following comparisons:

1.	K/L	/ɣAsK/	(dusk)	/ɣAsL/	(washing)
2.	K/H	/mAzK/	(tearing)	/mAzH/	(joking)
3.	K/T	/bAsK/	(to be high)	/bAsT/	(delight)
4.	K/b	/nAsK/	(arranging)	/nAsb/	(attributing to)
5.	K/f	/nAzK/	(rashness)	/nAzf/	(bleeding)
6.	K/n	/xAzK/	(piercing into)	/xAzn/	(storing)
7.	K/m	/ʕAzK/	(digging)	/ʕAzm/	(resolution)
8.	K/ẖ	/nAzK/	(rashness)	/nAzẖ/	(to be far off)
9.	K/x	/nAsK/	(arranging)	/nAsx/	(abolition)
10.	K/v̤z	/lAzK/	(sticking)	/lAzv̤z/	(to adhere)
11.	K/ɣ	/nAsK/	(arranging)	/nAsɣ/	(wrist)
12.	K/ʕ	/nAzK/	(rashness)	/nAzʕ/	(taking away)
13.	K/r	/nAzK/	"	/nAzr/	(a little)

d) The realization of /K/

This archiphoneme is realized as an emphatic, dorsal, unvoiced [q].

The archiphoneme /D/.

a) This archiphoneme belongs to pos. 'i^{1}'.

b) It commutes with /X, v̤S, N, ʃ, b, f, t, d, ɵ, ɤ, ɤ̤, s, s̤, z, q, k, l, r, ʔ, h, ɣ, x, v̤s, v̤z, m, n, ʕ, ẖ, ø/

c) The identity and distinctive function of /D/ are established by the following comparisons:

1.	D/b	/nADs/	(learned 'n')	/nAbs/	(uttering)
2.	D/r	/ʕADs̬/	(thirst)	/ʕArs̬/	(throne)
3.	D/f	/nADq/	(speech)	/nAfq/	(spending)
4.	D/k	/ʕADs̬/	(thirst)	/ʕAks̬/	(tying)
5.	D/m	/ɣADs/	(diving)	/ɣAms/	(plunging)
6.	D/q	/s̬ADH/	(walking on the shore)	/s̬AqH/	(splitting)
7.	D/ʕ	/nADq/	(to speak)	/nAʕq/	(croaking)
8.	D/S̬	/ʕADs/	(sneezing)	/ʕAS̬s/	(to grasp firmly)
9.	D/d	/nADs/	(learned 'n')	/nAḍs/	(stabing)
10.	D/X	/nADs/	(")	/nAXs/	(pricking)
11.	D/	/lADθ/	(hitting)	/lAʢθ/	(to be slow)

d) The realization of /D/.

This archiphoneme is realized as an emphatic, apical, occlusive, unvoiced [ṭ].

The archiphoneme /X/.

a) This archiphoneme belongs to pos. 'i[1]'.

b) It commutes with /b, f, t, d, θ, ɣ̣, x̣, ʕ, s̬, z, s, k, q, l, r, ʔ, h, S, N, D, ʢ, ḥ, n, ṭ, ḍ, m, s̬, z̬, ø/

c) The identity and distinctive function of /X/ are established by the following comparisons:

1.	X/b	/rAXd/	(comfortable)	/rAbd/	(to become ashen)
2.	X/D	/rAXd/	(")	/rADd/	(to pile up)

3.	X/ʕ	/rAXd/	(comfortable)	/rAʕd/	(thunder)
4.	X/f	/rAXd/	(")	/rAfd/	(support)
5.	X/q	/rAXd/	(")	/rAqd/	(sleeping)
6.	X/m	/nAXs/	(to prick)	/nAms/	(to hide)
7.	X/ḥ	/rAXd/	(comfortable)	/rAḥd/	(to crush)
8.	X/l	/sAXṭ/	(anger)	/sAlṭ/	(impolite)
9.	X/r	/sAXṭ/	(")	/sArṭ/	(to swallow)
10.	X/s̬	/nAXs/	(to prick)	/nAs̬s/	(dirty)
11.	X/ʂ	/nAXs̬/	(to move)	/nAʂs̬/	(bier)
12.	X/t	/nAXs̬/	(" ")	/nAts̬/	(to pluck out)
13.	X/h	/nAXs̬/	(" ")	/nAhs̬/	(to bite)
14.	X/k	/nAXs/	(to prick)	/nAks/	(to turn upside down)
15.	X/d	/nAXs/	(" ")	/nAds/	(to revile)
16.	X/ʔ	/nAXs̬/	(to move)	/nAʔs̬/	(to take)

d) The realization of /X/.

This archiphoneme has two contextual variants. It is realized as a voiced, velar [ɣ] in the context of succeeding voiced consonant, e.g. /rAXd/ (comfortable) realised as [raɣd]. It is realized as an unvoiced, velar [x] in the context of succeeding unvoiced consonant, e.g. /sAXṭ/ (anger) realized as [saxṭ].

The archiphoneme /T/.

a) This archiphoneme belongs to pos. 'i^2'.

b) It commutes with /f, b, m, ḍ, k, r, l, n, ɣ, ʒ̬, ɵ, z̬, s̬, ʔ, h, z, s, ṣ, ʕ, ḥ, ɣ, x, q, K, θ, H, L, ø/

c) The identity and distinctive function of /T/ are established by the following comparisons:

1.	T/b	/qAs̤T/	(intention)	/qAs̤b/	(to cut up)
2.	T/f	/qAs̤T/	(")	/qAs̤f/	(bombardment)
3.	T/r	/qAs̤T/	(")	/qAs̤r/	(palace)
4.	T/L	/qAs̤T/	(intention)	/qAs̤L/	(to cut off)
5.	T/ʕ	/qAs̤T/	(")	/qAs̤ʕ/	(to crush)
6.	T/s	/nAʕT/	(qualification)	/nAʕs/	(to be sleepy)
7.	T/s̤	/nAʕT/	(")	/nAʕs̤/	(to move)
8.	T/q	/nAS̆T/	(active)	/nAS̆q/	(to smell)
9.	T/H	/nAS̆T/	(")	/nAS̆H/	(arising)
10.	T/θ	/nAʕT/	(qualification)	/nAʕθ/	(to take)
11.	T/K	/ħ̇AsT/	(envy)	/ħ̇AsK/	(to be angry)
12.	T/m	/ħ̇AsT/	(")	/ħ̇Asm/	(to finish)

d) The realisation of /T/

This archiphoneme has two contextual varients. It is realized as a voiced apical [d] in the context of a preceding unvoiced consonant, e.g. /ħ̇AsT/ (envy) realized as [hasd]. It is realized as an unvoiced apical [t] or [t̤] in the context of a preceding voiced consonant, e.g. /nAʕT/ (qualification) and /nAS̆T/ (active) realized as [naʕt] and [naS̆t̤], respectively.

The archiphoneme /S̆/.

a) This archiphoneme belongs to pos. 'i[1]'.

b) It commutes with /b, f, m, n, ɵ, ʒ̤, ʒ, t, t̤, d̤, d, ʔ, h, z, s, s̤, ɣ, x, ʕ, h, q, k, r, l, D, X, ʢ, N, ø/

c) The identity and distinctive function of /$\overset{v}{S}$/ are established by the following comparisons:

1.	$\overset{v}{S}$/X	see: x.10.			
2.	$\overset{v}{S}$/D	/nA$\overset{v}{S}$q/	(to smell)	/nADq/	(to speak)
3.	$\overset{v}{S}$/ʕ	/nA$\overset{v}{S}$q/	(" ")	/nAʕq/	(to croak)
4.	$\overset{v}{S}$/q	/nA$\overset{v}{S}$s/	(dirty)	/nAqs/	(to hit)
5.	$\overset{v}{S}$/k	/nA$\overset{v}{S}$s/	(")	/nAKs/	(to turn upside down)
6.	$\overset{v}{S}$/m	/nA$\overset{v}{S}$s/	(")	/nAms/	(conceal)
7.	$\overset{v}{S}$/h	/nA$\overset{v}{S}$q/	(to smell)	/nAhq/	(to bray)
8.	$\overset{v}{S}$/f	/nA$\overset{v}{S}$s/	(dirty)	/nAfs/	(spirit)
9.	$\overset{v}{S}$/ħ	/nA$\overset{v}{S}$s/	(")	/nAħs/	(bad luck)
10.	$\overset{v}{S}$/b	/nA$\overset{v}{S}$s/	(")	/nAbs/	(to speak)
11.	$\overset{v}{S}$/s	/nA$\overset{v}{S}$q/	(to smell)	/nAsq/	(ordering)
12.	$\overset{v}{S}$/z	/nA$\overset{v}{S}$q/	(" ")	/nAzq/	(to storm ahead)
13.	$\overset{v}{S}$/t	/nA$\overset{v}{S}$q/	(" ")	/nAtq/	(to raise)

d) The realization of /$\overset{v}{S}$/

This archiphoneme is realized as an unvoiced hushing [$\overset{v}{s}$].

The archiphoneme /N/.

a) This archiphoneme belongs to pos. 'i[1]'.

b) It commutes with /f, b, t̤, t, d, d̤, ɔ, ɔ̤, ɵ, r, $\overset{v}{z}$, $\overset{v}{s}$, ʔ, h, s, s̤, z, ʕ, ħ, x, ɣ, k, q, u, l, D, X, $\overset{v}{S}$, ʃ, ø/

c) The identity and distinctive function of /N/ are established by the following comparisons:

1.	N/z	/ʕANf/	(violence)	/ʕAzf/	(playing on a musical instrument)
2.	N/ṣ	/ʕANf/	(")	/ʕAṣf/	(to storm)
3.	N/s	/ʕANf/	(")	/ʕAsf/	(to oppress)
4.	N/ɜ	/ʕANf/	(")	/ʕAɜf/	(has little food)
5.	N/d	/ʕANf/	(")	/ʕAdf/	(he ate little)
6.	N/ṭ	/ʕANf/	(")	/ʕAṭf/	(to awaken sympathy)
7.	N/q	/ʕANf/	(")	/ʕAqf/	(to crook)
8.	N/k	/ʕANf/	(")	/ʕAkf/	(to hold back)
9.	N/l	/ʕANf/	(")	/ʕAlf/	(to feed)
10.	N/$\overset{v}{z}$	/ʕANf/	(")	/ʕA$\overset{v}{z}$f/	(left the food)
11.	N/u	/ɜANb/	(guilt)	/ɜAub/	(to dissolve)
12.	N/r	/ɜANb/	(")	/ɜArb/	(to be sharp)

d) The realization of /N/

The realization of this phoneme usually oscillates between the realization of /m/ and that of /n/.

The archiphoneme /Θ/.

a) This archiphoneme belongs to pos. 'i^{2}'.

b) It commutes with /b, f, m, n, t, ṭ, d, ḍ, r, $\overset{v}{z}$, $\overset{v}{s}$, ʔ, h, s, ṣ, z, ɜ, x, ʕ, ḥ, q, k, L, K, T , H ø/

c) The identity and distinctive function of /Θ/ are established by the following comparisons:

1.	Θ/k	/uArΘ/	(to inherit)	/uArk/	(hip)
2.	Θ/t	/bAhΘ/	(to weigh heavily)	/bAht/	(to be amazed)
3.	Θ/b	/lAhΘ/	(to be out of breath)	/lAhb/	(to flame)

4.	θ/$\overset{v}{z}$	/lAhθ/	(to be out of breath)	/lAh$\overset{v}{z}$/	(to be attached to)
5.	θ/d	/lAhθ/	(" " " ")	/lAhd/	(to overburden)
6.	θ/s	/lAhθ/	(" " " ")	/lAhs/	(to lick)
7.	θ/z	/lAhθ/	(" " " ")	/lAhz/	(to be appeared in)
8.	θ/t	/lAhθ/	(" " " ")	/lAht̤/	(to slab)
9.	θ/f	/lAhθ/	(" " " ")	/lAhf/	(to regret)
10.	θ/m	/lAhθ/	(" " " ")	/lAhm/	(to devour)
11.	θ/q	/ħ̤Arθ/	(ploughed)	/ħ̤Arq/	(to burn)
12.	θ/r	/$\overset{v}{s}$Aʕθ/	(scattered 'things')	/$\overset{v}{s}$Aʕr/	(hair)
13.	0/$\overset{v}{s}$	/uArθ/	(to inherit)	/uAr$\overset{v}{s}$/	(to be greedy)
14.	θ/q	/uArθ/	(" ")	/uArʕ/	(pious)
15.	θ/T	/ħ̤Anθ/	(to roast)	/ħ̤AnT/	(it becomes red)

d) The realization of /θ/

This archiphoneme is realized as a fricative, labio-dental voiced [ʒ].

The archiphoneme /H/.

a) This archiphoneme belongs to pos. 'i^{2}'.

b) It commutes with /b, f, m, t, d, ṭ, ḍ, ʒ, ʒ̣, ɵ, n, r, $\overset{v}{z}$, $\overset{v}{s}$, s, ṣ, z, ɣ, x, ʕ, h, q, k, L, K, θ, T, ø/

c) The identity and distinctive function of /H/ are established by the following comparisons:

1.	H/n	/ʕAtH/	(idiocy)	/ʕAtn/	(to be imprisoned)
2.	H/m	/ʕAtH/	(")	/ʕAtm/	(to darken)

3.	H/L	/ʔAtH/	(idiocy)	/ʔAtL/	(to carry)
4.	H/k	/ʔAtH/	(")	/ʔAtk/	(to be sour)
5.	H/q	/ʔAtH/	(")	/ʔAtq/	(to free)
6.	H/r	/ʔAtH/	(")	/ʔAtr/	(to shake)
7.	H/f	/ʔAtH/	(")	/ʔAtf/	(to pluck)
8.	H/b	/ʔAtH/	(")	/ʔAtb/	(to blame)
9.	H/$\overset{v}{z}$	/nA$\overset{v}{s}$H/	(to develop)	/nA$\overset{vv}{s}z$/	(to sob)
10.	H/ʕ	/nA$\overset{v}{s}$H/	(" ")	/nA$\overset{v}{s}$ʕ/	(to tear out)
11.	H/ɣ	/nAsH/	(to delay)	/nAsɣ/	(to mix)

d) <u>The realization of /H/</u>.

This archiphoneme is realized as an unvoiced glottal [h].

<u>The archiphoneme /ʃ/</u>.

a) This archiphoneme belongs to pos. 'i[1]'.

b) It commutes with /b, f, m, n, t, d, ɬ, ɬ̣, t, d, θ, r, l, ɣ, x, ʔ, s, ṣ, z, $\overset{v}{z}$, $\overset{v}{s}$, q, k, D, X, $\overset{x}{S}$, N, ø/

c) The identity and distinctive function of /ʃ/ are established by the following comparisons:

1.	ʃ/t	/uAʃ$\overset{v}{s}$/	(monster)	/uAt$\overset{v}{s}$/	(little of everything)
2.	ʃ/r	/uAʃ$\overset{v}{s}$/	(")	/uAr$\overset{v}{s}$/	(to interfere with)
3.	ʃ/b	/uAʃ$\overset{v}{s}$/	(")	/uAb$\overset{v}{s}$/	(to be mangy)
4.	ʃ/x	/uAʃ$\overset{v}{s}$/	(")	/uAx$\overset{v}{s}$/	(to be bad)
5.	ʃ/q	/uAʃ$\overset{v}{s}$/	(")	/uAq$\overset{v}{s}$/	(sound)
6.	ʃ/f	/lAʃ$\overset{ɣ}{\underset{\cdot}{}}$/	(to observe)	/lAfɣ̣/	(to pronounce)

7.	ʢ/m	/lAʢʖ/	(to observe)	/lAmʖ/ (to lick one's lips)
8.	ʢ/ʔ	/laʢʖ/	(" ")	/lAʔʖ/ (to drive away)
9.	ʢ/X	/naʢ^{v}s/	(bier)	/nAXs^{v}/ (to move)
10.	ʢ/k	/nAʢ^{v}s/	/bier)	/nAks^{v}/ (to clear out)

d) The realization of /ʢ/

The realization of this archiphoneme usually oscillates between the realization of /ʕ/ and that of /ħ/; (see the realization of these two phonemes in the previous chapter).

The archiphoneme /L/.

a) This archiphoneme belongs to pos. 'i^{2}'.

b) It commutes with /b, f, m, n, r, t, ṭ, ḍ, d, ɵ, ʖ, ʒ, ɣ, x, ʔ, h, ʕ, ħ, q, k, s, z, ṣ, ^{v}z, ^{v}s, H, Θ, T, K, ø/

c) The identity and distinctive function of /L/ are established by the following comparisons:

1.	L/b	/ʕAʖL/	(to blame)	/ʕAʖb/ (sweet)
2.	L/f	/ʕAʖL/	(" ")	/ʕAʖf/ (to eat something)
3.	L/m	/ʕAʖL/	(" ")	/ʕAʖm/ (to abuse)
4.	L/r	/ʕAʖL/	(" ")	/ʕAʖr/ (to circumcise)
5.	L/q	/ʕAʖL/	(" ")	/ʕAʖq/ (to cut)
6.	L/^{v}z	/ʕAʖL/	(to blame)	/ʕAʖ^{v}z/ (to drink)
7.	L/n	/ʕAdL/	(justice)	/ʕAdn/ (Eden)
8.	L/s	/nAmL/	(ants)	/nAms/ (to keep secret)
9.	L/k	/ʕAtL/	(to carry)	/ʕAtk/ (to be sour)

10.	L/H	/ʕAtL/	(to carry)	/ʕAtH/	(idol)
11.	L/s̤	/nAmL/	(ants)	/nAms̤/	(to pluck)
12.	L/ʔ	/nAmL/	(")	/nAmʔ/	(baby-lice)
13.	L/d	/uAħL/	(mud)	/uAħd/	(alone)
14.	L/x	/fAsL/	(false)	/fAsx/	(to cancel)
15.	L/t	/nAħL/	(bees)	/nAħt/	(stonework)
16.	L/d̤	/nAħL/	(")	/nAħd̤/	(plenty of meat)
17.	L/z	/nAħL/	(")	/nAħz/	(to cough)
18.	L/K	/nAsL/	(descendants)	/nAsK/	(to arrange)
19.	L/T	/qAs̤L/	(to cut off)	/qAs̤T/	(intention)
20.	L/ɵ	/bAʕL/	(husband)	/bAʕɵ/	(some of)
21.	L/ħ	/bAtL/	(to be abolished)	/bAtħ/	(to knock down)
22.	L/t̤	/nAbL/	(arrows)	/nAbt/	(to grow)
23.	L/s̬	/nAbL/	(")	/nAbs̬/	(digging up)
24.	L/ʒ	/nAbL/	(")	/nAbʒ/	(discarding)

d) The realisation of /L/

This archiphoneme is realized as a lateral [l].

The consonantal archi-phonemes and their distinctive features.

	D	T	Θ	S	H	N	ʃ	X	L	K
labial	-	-	-	-	-	n	o	o	o	o
apical	+	+	+	-	-	n	o	o	o	o
hushing	-	-	-	+	-	o	o	o	o	o
glottal	-	-	-	-	+	o	o	o	o	o
occlusive	+	+	-	n	n	-	o	o	o	o
fricative	-	-	+	n	n	-	o	o	o	o
nasal	-	-	-	o	o	+	o	o	o	o
voiced	n	n	n	o	o	o	n	n	o	o
unvoiced	n	n	n	o	o	o	n	n	o	o
emphatic	+	n	n	o	o	o	o	o	n	n
non-emphatic	-	n	n	o	o	o	o	o	n	n
Pharyngal	o	o	o	o	o	o	+	-	o	o
velar	o	o	o	o	o	o	-	+	o	o
dorsal	o	o	o	o	o	o	o	o	-	+
lateral	o	o	o	o	o	o	o	o	+	-

+: a positive feature of the archi-phoneme in question.

-: a functional opposition of the archi-phoneme in respect to other distinctive features.

o: a non-functional feature in respect to the archi-phoneme.

n: the suspension of the functional opposition of the feature(s) in respect to the archi-phoneme in question. Its function is in fact, similar to that of (o) but (n) is chosen rather than (o) for an easier reference to neutralisation.

CHAPTER VII.

The Vowel and Semi-Vowel Phonemes of Modern Standard Arabic and their Realisations.

The aim of this chapter is to establish the vowels and semi-vowels of Modern Standard Arabic, their identity and distinctive function, and to state their most common realisations. This description is different from other descriptions of the same phenomena to be found in the literature, e.g. (Nasr 1967, Beeston 1970, Tritton 1962); this is inevitable due to the fact that a different theoretical framework is employed in this thesis.

The vocalic and semi-vocalic system of Modern Standard Arabic consists of six phonemes[1] - which I have listed below with examples[2]; the first four are vowels, and the last two are semi-vowels[3]:

1. /a/ as in /ʔab/ "a father"
2. /ā/ as in /dār/ "a house"
3. /ī/ as in /fīl/ "an elephant"
4. /ū/ as in /dūr/ "houses"
5. /i/ as in /min/ "from"
6. /u/ as in /ḥub/ "love"

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(1) Functionally speaking, there are no dipthongs in Modern Standard Arabic.

(2) The identity and distinctive function of these phonemes is given later in this chapter.

(3) The distinction between vowels and semi-vowels is a distributional one. Vowels always occur in the nuclear position of the distributional unit, whereas semi-vowels occur in nuclear and peripheral positions (see Chapter III section 2.4)

In comparison with the consonantal system, the vocalic system of Modern Standard Arabic is very simple. As the following table indicates each one of the phonemes listed above is a simultaneous bundle of two distinctive features:

	spread	neutral	rounded[1]
short	i	a	u
long	ī	ā	ū

(fig. 1)

This table exhibits two dimensions:

1. /short ~ long/
2. /spread ~ neutral ~ rounded/

It might be suggested that the set of vocalic phonemes in Modern Standard Arabic would be considerably reduced if "reduplication," rather than "correlation of length", was adopted in dealing with /ī/, /ā/ and /ū/. According to this solution, each of the preceding phonemes would be replaced by a phoneme cluster consisting of the repetition of its short counterpart twice, therefore reducing the number of vocalic phonemes in Modern Standard Arabic to three instead of six. On the basis of this assumption, each one of the phonemes /ī/, /ā/ and /ū/ would be regarded as a mere succession of one and the same phoneme, i.e. /ii/, /aa/ and /uu/, respectively occurring twice and occupying one and the same position. As far as 'phonetic adequacy' is concerned

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(1) The features 'spread' and 'rounded' may be alternatively replaced by 'front' and 'back', respectively; the feature 'neutral' may be replaced by 'central', but the former term is more adequate with respect to the realisation of /a/ and /ā/ since these two phonemes are, phonetically speaking, not completely central.

this solution is no less congruent with the phonetic data than the solution we have adopted in this thesis.

In rejecting this solution, considerations of adequacy, pertaining to neutralisation and the establishment of archi-phonemes have been taken into account. In evaluating linguistic descriptions, such considerations of adequacy are prior to the criterion of simplicity which has been invoked in arguing for the solution utilising "reduplication" in the preceding paragraph. Our data have certain cases where particular distributional considerations consistently determine, the occurrence of a 'short' vowel and preclude the occurrence of a 'long' one in the nuclear position. It is noticed that the occurrence of an element other than zero in each of pos. 'i^1' and pos. 'i^2' consistently determines the occurrence of a 'short' vowel in the nuclear position. This means that it is not possible to set up a functional opposition between short and long vowels in this position and, therefore, neutralisation of this opposition is said to take place. This point will be fully explained and exemplified in the next chapter. Suffice it to say here, that a description which fails to account for this feature of Modern Standard Arabic cannot be said to be an adequate description and, therefore, must be rejected. Now, the proposed solution utilising "reduplication" leads to the setting up of such a description as, in the vocalic system established in accordance with this solution, the opposition /long/$\sim$/short/ ceases to be functional, leaving the neutralisation mentioned above completely unaccounted for. This solution must, therefore, be rejected on grounds of adequacy.

The treatment of /i/ and /u/ as semi-vowels above, and the recognition of [j] and [w] as realisations of these two semi-vowels(1), respectively,

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(1) This point will be illustrated later in the chapter.

need further discussion. To begin, the present description of Modern Standard Arabic is fundamentally different from other descriptions of the same phenomena, for example Nasr (1967), in not allocating [j] and [w] to a set of semi-consonantal phonemes /j/ and /w/ which are different from /i/ and /u/, respectively. By doing this, we have succeeded in reducing the total number of phonemes in Modern Standard Arabic by two and, therefore, have succeeded in setting up a simpler description than has hitherto been given, at least as far as the number of phonemes in Modern Standard Arabic is concerned.

Let us consider the following two hypotheses in dealing with [i] and [j]:

a) [i] and [j] are realisations of two different phonemes /i/ and /j/, or

b) [i] and [j] are different realisations of one and the same phoneme which we shall symbolise by /i/.

Obviously these two hypotheses are mutually contradictory; one cannot accept the first hypothesis without rejecting the second one, and vice-versa. Now, to demonstrate that /i/ and /j/ are separate phonemes in Modern Standard Arabic, we must be able to show that they belong to the same 'position class [1]', i.e. that they can be commuted with each other. This, however, is not the case. The tentative phoneme /i/ always occurs in the nuclear position and can commute with other vowels in this position, but never with a consonant. The tentative phoneme /j/, on the other hand, occurs only in the explosive and the first implosive positions. In the first of these positions it can commute with a consonant and with the /u/,[2] but never with a vowel or its own absence.

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1) "Position class" for "a set of items which can occur in the same position or archi-position" (Mulder 1968: 118).

2) We assume here that [u] and [w] are established as different realisations of the same phoneme /u/; see the last part of this section for this point.

In the implosive position, this tentative phoneme can commute with a consonant and /u/, as well as with its own absence (zero), but never with a vowel. Clearly, the tentative phonemes /i/ and /j/ belong to a different 'position classes' and, therefore, the hypothesis that they are, well and truly, different phonemes is said to be refuted, i.e. cannot be corroborated. This leaves us with the second hypothesis. But since this hypothesis is the converse of the first one, then we conclude that [i] and [j] are different realisations of the same phoneme /i/. This phoneme is considered as a semi-vowel because of its capacity to stand in peripheral positions when the nuclear position is filled by a vowel, e.g. /ḥai/ "alive" or /iA?s/ "despair", and in the nuclear position in the absence of a vowel in this position, e.g. /min/ "from". Finally, when /i/ occurs in a peripheral position, it is realised by [j] and when it occurs in the nuclear position it is realised by [i].

Arguments of the same kind can be adduced for supporting the hypothesis that [w] and [u] are different realisations of the same phoneme /u/ and for the status of this phoneme as a semi-vowel. When it stands in a peripheral position, e.g. /uAqt/ "time", /iAum/ "day", /u/ is realised by [w]; in the nuclear position, e.g. /qul/ "say!", it is realised by [u].

Finally, the set of the vowel phonemes of Modern Standard Arabic fall into two positional categories:

a) the vowels /a/, /ā/, /ī/, /ū/ which can only occur in the nuclear position, and which, together with the semi-vowels /i/ and /u/ constitute the entire set of the nuclear position class, and

b) the semi-vowels /i/ and /u/ which, in addition to belonging to the nuclear position class, belong to the explosive and the first implosive position class.

The phoneme /a/.

a) This phoneme belongs to pos. 'n'.

b) It commutes with /ā, ī, ū, u, i/

c) The identity and distinctive function of /a/ are established by the following comparisons:

1.	a/ā	/ʔab/	(father)	/ʔāb/	(to return)
2.	a/ī	/ˠsab/	(alum)	/ˠsīb/	(old 'men')
3.	a/ū	/bar/	(land)	/būr/	(fallow)
4.	a/u	/sad/	(obstruction)	/sud/	(close up!)
5.	a/i	/man/	(who?)	/min/	(from)

d) The realization of /a/.

This phoneme is realised as a short open front vowel [a] with lips neutral as in forms like /ʔab/ (father) and /ˠsab/ (alum), realised as [ʔab] and [ˠsab], respectively.

In the vicinity of emphatics, it is realised as pharyngalized and it exerts a retracting influence on the adjacent consonants. For instance, forms like /ḍab/ (lizard) and /maṣ/ (to suck) are realized as [ḍʌb] and [mʌṣ].

The phoneme /ā/.

a) This phoneme belongs to pos. 'n'.

b) It commutes with /a, ī, ū, u, i/.

c) The identity and distinctive function of /ā/ are established by the following comparisons:

1.	ā/a	see: a.1.			
2.	ā/ī	/rāḥ/	(to go away)	/rīḥ/	(wind)
3.	ā/ū	/dār/	(a house)	/dūr/	(houses)
4.	ā/u	/qāl/	(to say)	/qul/	(say!)
5.	ā/i	/ḥāl/	(condition)	/ḥil/	(solve!)

d) The realisation of /ā/

In the vicinity of non-emphatic, this vowel phoneme is realised as a long open front [a:] . For example, forms like /nām/ (to sleep) and /sār/ (to walk) are realized as [na: m] and [sa: r].

In the vicinityof emphatics, it has a pharyngalized (back) realisation [@:]. The sound [@:], in turn, exerts a retracting influence on the following or preceding consonants. For example, forms like /ṣām/ (to fast) and /ɣāẓ/ (to make angry) are realized as [ṣ@:m̲] and [ɣ̲@:ẓ] (1). In the realization of long back [@:], the oral cavity tends to be narrower and the labial aperture is slightly rounded. It is important to note that [a:] and [@:] are purely lengthened /ā/.

The phoneme /ī/.

a) This phoneme belongs to pos. 'n'.

b) It commutes with /a, ā, ū, u, i/.

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1) Notice that [m̲] and [ɣ̲] are merely contextual variants of /m/ and /ɣ/.

c) The identity and distinctive function of /ī/ are established by the following comparisons:

1.	ī/a	see: a.2.			
2.	ī/ā	see: ā.2.			
3.	ī/ū	/zīr/	(water-jar)	/zūr/	(falsehood)
4.	ī/u	/fīl/	(elephant)	/ful/	(Arabian jasmine)
5.	ī/i	/ʕīd/	(feast)	/ʕid/	(Count!)

d) The realization of /ī/

The vowel phoneme /ī/ is the long counterpart of the phoneme /i/. It is realized as a long front close [i:].

The phoneme /ū/.

a) This phoneme belongs to pos. 'n'.

b) It commutes with /a, ā, ī, u, i/

c) The identity and distinctive function of /ū/ are established by the following comparisons:

1.	ū/a	see: a.3.			
2.	ū/ā	see: ā.3.			
3.	ū/ī	see: ī.3.			
4.	ū/u	/dūr/	(houses)	/dur/	(turn!)
5.	ū/i	/sūr/	(wall)	/sir/	(a secret)

d) The realization of /ū/.

The vowel phoneme /ū/ is the long counterpart of the phoneme /u/. It is realized as a long rounded back close [u:].

The phoneme /u/.

For the realization and distinctive opposition of this semi-vowel phoneme see page: 101.

The phoneme /i/.

For the realization and distinctive opposition of this semi-vowel phoneme see page: 102.

The distinctive features of the vowel and semi-vowel phonemes of Modern Standard Arabic.

	a	ā	ū	u	ī	i
spread	-	-	-	-	+	+
neutral	+	+	-	-	-	-
rounded	-	-	+	+	-	-
long	-	+	+	-	+	+
short	+	-	-	+	-	-

For the (+, -) see (Chapter V, section 1).

CHAPTER VIII.

Neutralisation and Vocalic Archiphonemes.

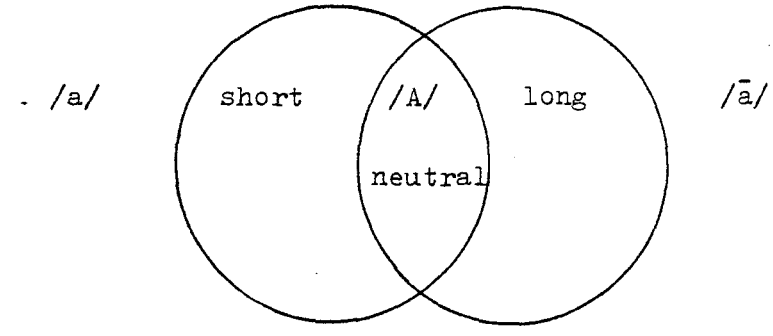
In section (3.2.3) we have seen that, from the point of view of Axiomatic Functionalism, 'neutralisation' is the suspension of opposition between two or more phonemes in a specific and constant context. Further, the phonemes partaking in a neutralisation must have, at least, one distinctive feature in common. They must also differ from one another in, at least, one distinctive feature. The entity which results from such a neutralisation is called 'archi-phoneme'. The archi-phoneme is a phoneme in its own right, despite the fact that it is restricted in occurrence to contexts where the neutralisation takes place.

There is only one type of neutralisation in Modern Standard Arabic, namely the /short/~/long/ neutralisation which is restricted to the nuclear position when pos. 'i^1' and 'i^2' are both filled by an element other than zero. The archi-phonemes which result from this neutralisation are:

1. /A/ representing the suspension of the opposition between /a/~/ā/.
2. /I/ representing the suspension of the opposition between /i/~/ī/.
3. /U/ representing the suspension of the opposition between /u/~/ū/

In a form like /kAlb/ (a dog), for instance, whether /A/ is 'short' or 'long' is not functionally relevant, as, in this context, we are unable to establish a functional opposition between the 'short' /a/ and the 'long'

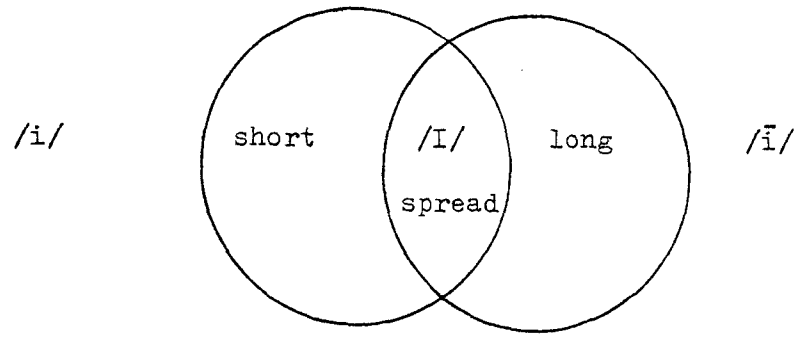
/ā/. In other words, as far as the above example is concerned we cannot establish a 'short' vowel phoneme /a/ in */kalb/ because in the absence of a 'long' /ā/ to which /a/ might be opposed, /a/ cannot be shown to be a 'short' phoneme. This means that the only feature which is relevant for this archi-phoneme is the feature 'neutral', i.e. it is a simultaneous bundle of one distinctive feature only. This archi-phoneme is 'neutral' by being opposed to 'spread' and 'rounded' vowel phonemes. The archi-phoneme /A/ is represented, in the overall system, by the (short, neutral) /a/ and the (long, neutral) /ā/. The archi-phoneme /A/ can be represented by the following diagram:



(fig. 1)

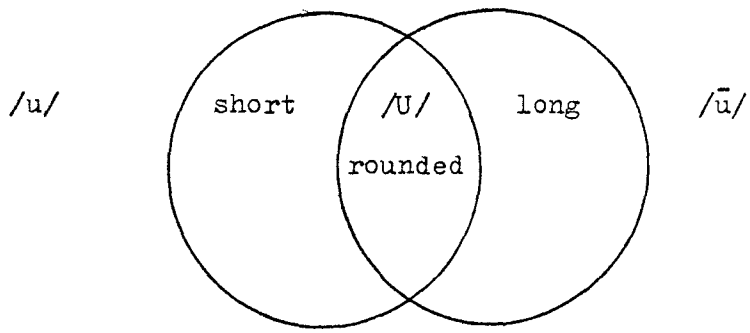
Considerations of the same type apply in the establishment of the archi-phoneme /I/, as in /sIh̬r/ (magic). The only feature which is relevant for this archi-phoneme is the feature 'spread' which derives its identity from its opposition with the features 'neutral' and 'rounded'. The archi-phoneme /I/ is represented in the overall system by the (short, spread) /i/ and the (long, spread) /ī/. This neutralisation can be

represented by the following diagram:



(fig. 2)

Similarly, considerations of the above-mentioned type apply in the establishment of the archi-phoneme /U/ as in /bUxL/ (stinginess). The only feature which is relevant for this archi-phoneme is the feature 'rounded' which derives its identity from its opposition with the features 'neutral' and 'spread'. The archi-phoneme /U/ is represented in the overall system by the (short, rounded) /u/ and the (long, rounded) /ū/. This archiphoneme can be represented by the following diagram:



(fig. 3)

The archiphoneme /A/.

a) This archiphoneme belongs to pos. 'n'.

b) In this position it commutes with /I/ and /U/.

c) The identity and distinctive function of /A/ are established by the following comparisons:

1.	A/I	/sAz̬n/	(imprisonment)	/sIz̬n/	(prison)
2.	A/U	/xArz̬/	(expenditure)	/xUrz̬/	(saddlebag)

d) The realization of /A/

For the realization of this vowel archiphoneme, see the realization of the vowel phonemes /a/ and /ā/.

The archiphoneme /I/.

a) This archiphoneme belongs to pos. 'n'.

b) In this position it commutes with /A/ and /U/.

c) The identity and distinctive function of /I/ are established by the following comparisons:

1.	I/A	see: A.1.			
2.	I/U	/sIẖr/	(magic)	/sUẖr/	(lung)

d) The realization of /I/.

For the realization of this vowel archiphoneme, see the realizations of the vowel phoneme /ī/ and the semi-vowel phoneme /i/.

The archiphoneme /U/.

a) This archiphoneme belongs to pos. 'n'.

b) In this position it commutes with /A/ and /I/.

c) The identity and distinctive function of /U/ are established by the following comparisons:

1. U/A see: A.2.

2. U/I see: I.2.

d) The realization of /U/.

For the realization of this vowel archiphoneme, see the realization of the vowel phoneme /ū/ and the semi-vowel phoneme /u/.

The distinctive features of the vowel archiphonemes in Modern Standard Arabic.

	A	I	U
neutral	+	-	-
spread	-	+	-
rounded	-	-	+
short	n	n	n
long	n	n	n

For the symbols (+, -, n) see Chapter V, section 1.

addendum

With reference to page 132, I have realized, after submitting my thesis, that the argument of whether to adopt "reduplication" or "correlation of length" is a circular one. However, the decision to utilise "correlation of length," and therefore, establish long vowels /ī/, /ā/ and /ū/ in Arabic, is based on the notion of "position." Vowels, by definition, can only stand in the nuclear position and can never commute with zero. If reduplication is adopted, then there will be many cases in which vowels will be seen to commute with zero, i.e. the notion of vowel as always standing in a nuclear position will be violated. For example, according to this solution, one of the vowels of /saal/ (to flow) commutes with zero, i.e. /sal/ (to ask). To avoid this, it is essential that "reduplication" should be rejected and, since "correlation of length" appears to be the only other solution which is both consistent with the theory and with the data, the adoption of length and the establishment of long vowels /ī/, /ā/ and /ū/ seems to me to be fully justified.

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