

Bismillah

SOME REMARKS ON SIBAWAIHI'S CONTRIBUTION TO PHONETICS

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The claim that ancient Arabic phonetics was originally derived from, or influenced by, early Indian writings on phonetics is still unconvincing. All indications show that this Arabic science emerged and developed independently from the Indian one (or other sources, whether Greek or Latin, for that matter) and that both sciences share an important feature. That is, each of them had originated from an intense interest in the study of the religious works. Later this interest extended to non-religious, linguistic material as well. In the case of Arabic phonetics, it grew out of an immense enthusiasm on the part of the Muslims for reading, understanding, and articulating the sounds of the Qur'an correctly. Later on, the phonetic analysis also involved other areas such as poetry, prose, and the speech of the Arabs. Thus, whereas 'Ilm al-Tajwīd concerned itself with the recitation of the Qur'an, 'Ilm al-Aswāt wal-Hurūf (as coined by Ibn Jinni in Sirr al-Ṣinā'ah) covered both religious and non-religious material. Sibawaihi's work appears to fall under the latter discipline.

A comparison between The Kitāb of Sibawaihi and al-'Ain of his professor Al-Khalil Ibn Ahmad reveals that the former has benefited a great deal from the latter, especially as far as the phonetic material is concerned. This is not surprising since Sibawaihi quite often quotes from Al-Khalil's works. Although Sibawaihi does not mention his professor at all in the chapter on Idghām, there are a number of points where the influence of the latter appears quite clearly. We do not assume that Sibawaihi agrees with his professor all the time. To mention some of those points, note the following.

1. Sibawaihi uses many of the phonetic terms employed in al-'Ain.
2. Sibawaihi arranges the Arabic sounds in more or less the same way as they are arranged in al-'Ain. The

arrangement followed is made according to what can be called: the ascending order. That is to say that the sounds which are articulated in the larynx are described first, gradually followed by the sounds whose points of articulation are further forward along the vocal tract until the bilabial sounds are finally reached. Al-Khalil follows the following arrangement: ⁽¹⁾

<u>Phonetic Symbol</u>	<u>Letter</u>	<u>approximate Phonetic value</u>
ʕ	ع	Voiced pharyngeal fricative
ħ	ح	Voiceless pharyngeal fricative
h	هـ	voiceless breathed fricative
x	خ	voiceless uvular fricative
ɣ	غ	voiced uvular fricative
q	ق	voiced uvular stop
k	ك	voiceless velar stop
j	ج	voiced palatal stop
ʃ	ش	voiceless palato-alveolar fricative
ɖ	ض	voiced alveolar lateral fricative emphatic
ɓ	ص	voiceless alveolar-palatal fricative emphatic
s	س	" " " " non-
z	ز	voiced " " " "
<u>t̤</u>	ط	voiced alveolar stop emphatic
t	ت	voiceless alveolar stop non-emphatic
d	د	voiced alveolar stop non-emphatic
ð	ظ	voiced interdental fricative emphatic
θ	ث	voiceless interdental fricative non-emphatic
ð	ذ	voiced interdental fricative non-emphatic
r	ر	voiced dental trill
l	ل	voiced dental lateral
n	ن	voiced dental nasal
f	ف	voiced labio-dental fricative
b	ب	voiced bilabial stop

<u>Phonetic symbol</u>	<u>Letter</u>	<u>approximate Phonetic value</u>
m	م	voiced bilabial nasal
w/ u:	و	{ voiced bilabial semivowel voiced labiovelar long vowel
a:	ا	voiced long a
y/ i:	ي	{ voiced palatal semivowel voiced palatal long vowel
ʔ	ء	glottal stop

Sibawaihi is more objective in his arrangement than his professor who was influenced by criteria other than the phonetic ones. The following arrangement is given in al-Kitāb: ʔ, a:, h, ʕ, ʔ, γ, x, k, q, ʔ, j, ʃ, y/i:, l, r, n, ʔ, d, t, s, z, s, ɔ, ɔ, ɔ, f, b, m, w/

Sibawaihi's arrangement is more accurate than his professor's: whereas the latter gives this arrangement ʕ, ʔ, h, the former gives the more accurate arrangement h, ʕ, ʔ. On the other hand, Sibawaihi's arrangement of k and q is not correct. (2) Al-Khalil and most later Arab phoneticians arrange q before k as the former is produced further back than k.

3. Sibawaihi groups the sounds which are articulated in a given area of the vocal tract into a single group, thus giving:

Ḥurūf-ul-ḥalq the guttural sounds (laryngeal, pharyngeal
and uvular sounds)

Ḥurūf-ul-lisān the tongue sounds

Ḥurūf-ul-famm the oral sounds

This method of grouping sounds is frequently followed by Al-Khalil.

Sibawaihi treats in his book many of the phonological points which can also be found in al-'Ain. For instance, he makes statements regarding initial clusters, phonotactic arrangements. By the latter I mean those statements which deal with the permissible and non-permissible combinations of sounds.

1. Nūn xafīfah. This is the n which is influenced by the following consonants. E.g. N in ?inyalab → ?iNyalab (where → is an instruction to change the form on the left of the arrow into the form which is on its right; N being the voiced uvular nasal).
2. hamzat bayna bayna. This may be interpreted as the glottal stop which is not as strongly articulated as the pure hamzah.
3. ?alif mumālah. This may be symbolized as e:.
4. jīn kal jīm. This may be written with the phonetic symbol [c].
5. sād kal zāy. The nearest sound to this is the one symbolized as s.
6. ?alif tafxīm. It is pronounced approximately as [a:].

These 35 sound variants, as Sibawaihi tells us, are used in the Standard language, be it in speech, reading poetry, or reciting the Qur'an (p. 404). In addition, he includes another 7 sound variants, chief among which are [p] (bā' kal fā') and [g] (kāf bayn jīm and kāf). These sounds are used in non standard language and particularly colloquial speech (muḥāfahah). On examination, the first 29 variants are called basic apparently because each of them is represented by a written symbol; the rest of the sounds have no actual symbols of their own in the writing system of Arabic. This point confirms the view that Sibawaihi is interested in the speech of the Arabs, be it Standard or colloquial. It seems that he is the first Arab phonetician to tackle this kind of analysis.

Sibawaihi is aware of the articulatory processes involved in the production of the Arabic sounds. He clearly mentions the points of articulation (maxraj; pl. maxārij), and he is also aware of the static and active articulators. In his systematic treatment of the sounds, he divides the vocal tract into 16 points of articulation within each of which one or more sounds can be produced. He gives 18 short and precise statements displaying these points and referring to those sounds which are articulated within each point. Apart from the last statement, he again follows the ascending ordering of sounds as shown earlier. The following are the points stated in al-Kitāb (p. 405):

<u>Points of articulation</u>	<u>The sounds</u>
1. ʔaḡṣa-l-ḥalq (larynx)	ʔ, h, a:
2. ʔawsat-ul-ḥalq (pharynx)	ʕ, ḥ
3. ʔadna-l-ḥalq (uvular)	ʕ, x
4. ʔaḡṣa-l-lisan waḡā fawḡah min ḥanak ʔaḡlā (uvular or post uvular)	ḡ
5. min ʔaḡḡal ...waḡā fawḡah min ḥanak ʔaḡlā (velar or prevelar).	k
6. min wasat-il-lisān baynah wabayn wasat-il-ḥanak- il-ʔaḡlā (palatal)	j, ʃ, y/i:
7. ʔawwal ḥāffat-il-lisan waḡā yalīḥ min ʔaḡrās (the interior side of the tongue against the molars)	ḡ
8. min ḥāffat-il-lisān min ʔadnāḥā ʔila muntahā ḥaraf- il-lisān mā baynahā wabayna mā yalīḥa min ḥanak ʔaḡḡa waḡā fuwayqa-al-ḡāḡik, nāb, rubāʕiyyah, ḡaniyyah (the front side of the tongue and the tip against the front palate [front ridge, or gum] and the front teeth.)	l
9. min ḥaraf-il-lisān baynah wabayn mā fuwayq-al-ḡanāyā (the tip of the tongue against the alveolar)	n
10. min maxraj-il-nūn ḡayr ʔannah ʔadḡal fi ḡaḥr- il-lisān ḡalīlan (from the same point except that it is more backed)	r

<u>Point of articulation</u>	<u>The sounds</u>
11. mimmā bayna ʔaraf-il-lisān wa ʔusūl-il-ʔanāyā (the tip of the tongue is against the roof of the teeth)	t, ḏ, ṯ
12. mimmā bayna ʔaraf-il-lisān wa fuwayq-al-ʔanāyā (the tip of the tongue is against the area which is a little further back from the teeth)	z, s, ʕ
13. mimmā bayna ʔaraf-il-lisān wa ʔaʔrāf-il-ʔanāyā (the tip of the tongue is against the edges of the teeth; interdental sounds)	ḏ, ḏ, ʔ
14. min bāʔin-il-ʔafat-il-suflā wa ʔaʔrāf-il-ʔanāyā-al-ʔulyā (the inner part of the lower lip is against the edges of the upper teeth; the labio-dentals)	f
15. mimmā bayn-al-ʔafatayn maxraj-ul-bāʔ wal mīm wal wāw (the bilabials)	b, m, w/u:
16. min-al-xayāʔīm maxraj-ul-nūn-il-xafīʔah (from the nostrils)	N, ŋ, etc.

The inclusion of 16 as another point of articulation is understandable, since N (the uvular nasal), ŋ (the velar nasal), among others, are not articulated from the same point as the alveolar n. In other words, it is a variant of n.

After discussing the points of articulation, Sibawaihi moves on to divide the sounds according to the phonetic qualities (ṣifa:t, see p. 406) they possess; i.e. their manner of articulation. As for the first quality or feature, the jahr, he describes certain sounds as majhu:r and all the rest as mahmu:s, as shown below:

majhu:r

z
a:
f
r
g
j
y/i:
a
l
n
r
t
d
z

o
o
b
m
w/u:

mahmu:s

h

n
x
k
f

t
s
s

o
f

His definition of majhu:r and mahmu:s has puzzled scores of Arab phoneticians and Arabists because of its apparent vagueness.

Majhu:r has been rendered as "voiced, sonorous" and mahmu:s as "voiceless, muffled, etc." Curiously enough the terms are clearer than their definitions. A large section of Arabic scholars render them as voiced and voiceless, respectively. This can be supported by the text only if it is interpreted in a certain way. Let us translate the relevant text (al-Kitāb, II, pp. 405):

"As for the majhu:r, it is the sound in which the contact (in the larynx) is made and the breath (nafas) is not at all involved during the voicing (sawt). This is the state of the throat and mouth in the articulation of majhu:r sounds.

As for mahmu:s, it is the sound in which the contact (in the larynx) is not made and the breath issues through the mouth during its articulation."

If this interpretation is correct than we can assume that Sibawaihi was aware of the states of the vocal cords during the enunciation of the voiced and non-voiced sounds, or at least the effect of these states. The latter explanation is understood from the terms chosen; namely majhu:r (derived from j-h-r denoting loudness, clarity, sonority) and mahmu:s (from h-m-s denoting voicelessness). If we take the first interpretation that assumes his awareness of the states of the vocal cords, we can then explain why he considers 2 as majhu:r. That is to say, the vocal cords are close or drawn up together, somehow similar to the state of voicing. Whatever the case may be, the fact remains that almost all the majhu:r sounds are voiced in modern Arabic and all the mahmu:s sounds are voiceless.

Another major division of sounds is to ʃadi:d and raxw. (=rixw). ʃadi:d is rendered as "stop", raxw as "fricative or spirant". According to Sibawaihi, ʃadi:d is the sound in which the air (sawt, probably hawa: 2-ul-sawt) is interrupted, whereas the raxw is the sound in which the air issues without complete interruption, as displayed below:

ʃadi:d

ʔ

q

k

j

ʔ

t

d

b

raxw

h

ħ

ɣ, x

ʃ

ʂ

ʈ

ʒ

ʂ

ʈ

ʒ

ʂ

ʈ

He considers ʕ as both ʕadi:d and raxw. In modern analysis it is a fricative consonant. Some modern phoneticians have recognized the fact that ʕ is produced with a marked, though not complete, constriction of the throat and perhaps with some glottalic friction. It is clear from this point that voicing is not the only distinguishing factor between ʕ and ʔ.

Furthermore, Sibawaihi divides the sounds into muṭbaq and munfatih. These terms have been rendered in Arabic phonetics as velarized and non velarized. He is aware of the fact that the raising of the back of the tongue towards the upper palate as a secondary articulation (al-Kitāb, II, p. 406). The division may be displayed as follows:

muṭbaq

ḥ

ḍ

ẓ

ḏ

munfatih

the rest of the sounds

It is surprising, at this juncture, that he does not mention ʔ (la:m mufaxxamah) among the velarized consonants. Sibawaihi's statement with regard to this division is worth citing here. He says:

"Sounds are either muṭbaqah or munfatihah. The muṭbaqah are: ḥ, ḍ, ẓ, and ḏ. The munfatihah are the rest of the sounds. They are called so because you do not raise your tongue towards the upper palate. When articulating those four consonants, you raise your tongue to the upper palate. In this case the air (sawt, probably hawa:ʔ-ul-sawt) is modified (maṣṣur) in both the place where the tongue is raised for ʔiṭbaq, and the main point of articulation (mawḍiʕ -ul-Muru:f). As for ḍ and ẓ, etc. the air is modified

at the point of articulation only. The aforementioned four consonants have two places of constriction as displayed earlier."

There are also other divisions which will be touched upon shortly.

In retrospect, Sibawaihi appears to study the Arabic sounds from at least two main angles. On the one hand he looks on these sounds as independent units (Nuru:f); on the other he regards each sound as a complex of phonetic features (ʔifa:t). Concerning the concept of ʔarf (pl. Nuru:f), Sibawaihi as well as the Arab phoneticians considers that each sound-unit or ʔarf has at least three properties:

- a. the phonic property, i.e. how the unit is phonetically actualized.
- b. the pictorial or visual property, i.e. how this unit is conventionally written or symbolized;
- c. and the nomenclature property, i.e. the naming of each unit; e.g. ka:f, ʔa:ʔ, etc.

It is very difficult to know precisely the exact relations among these properties as conceived by Sibawaihi and even later Arab phoneticians. As for the basic units (ʔaʔl Nuru:f-il-ʔarabiyyah), which are 29 in number as listed earlier, one can see that each of them possesses the three properties. Thus k, for instance, has certain phonetic qualities, certain written shapes, and a certain name ka:f. Another example is a:. It is a vowel (ʔarf madd wa li:n) with certain phonetic characteristics, certain graphic patterns besides the name ʔalif. These properties seem to underlie Sibawaihi's analysis of the basic sound-units of Arabic. As for the non-basic units, they may lack one or more of the above-mentioned properties. To exemplify, let us take [g] and [p], which are not used in Classical or Standard Arabic.

Sibawaihi calls the first al-ji:m allati: kal-ka:f, literally translated as "the j which sounds like k; i.e. the voiced counterpart of k." On examination, one can see that j is voiced and that j agrees with k in that both are stops. [g] has no symbol of its own, and has no accurate name of its own. As for [p], it is called: al-ba:ʔ allati: kal-fa:ʔ, literally "the ba:ʔ which is like fa:ʔ "; i.e. "b which has the characteristics of f." One can see that the common feature between p and f is the lacking of voicing in both of them. Sibawaihi does not give any examples for the various non-basic units he mentions in his book. However, it is not impossible to reconstruct the sounds he is referring to from the fairly accurate description he makes in al-Kitāb.

We now turn to the second concept which underlies Sibawaihi's analysis of the Arabic sounds. That is, his description on the basis of "Feature" analysis. It seems to me that this is the area which is least understood of Sibawaihi's analysis. Later Arab phoneticians as well as Arabists have overlooked the underlying principles upon which Sibawaihi's description is based. One of the main principles is that he considers each unit as a bundle of phonetic features. In other words, he does not regard the unit as an indivisible whole; it is a whole which consists of various parts. Another important principle underlying Sibawaihi's statements is that Arabic has certain phonetic features; varied combinations of which make up the various units of the language. The third principle is that vowels as well as consonants may share some of the phonetic features. Thus a:, the ʔalif, is classified amongst the majhu:r sounds. It is to be noted that wa:w in Sibawaihi's classification means both the semivowel w and the vowel u:, and that ya:ʔ refers to both y and i:. This discrepancy is understandable, since w and u: are normally written with one letter, and y and i: are represented as a single letter.

Interestingly enough, this technique of analysis has something in common with one of the most recent phonetic theories which is known as "distinctive feature analysis", which is based on some sound scientific grounds drawing from concepts used in disciplines such as information theory, physics, physiology, among others. This theory puts forward the idea that there is a set of universal phonetic features from which each language selects for its own purposes. Thus voicing (entailing the vibration of the vocal cords) exists in all languages as far as we know. The theory also maintains that (Roman Jakobson and Morris Halle, Fundamental of Language, The Hague: Mouton, 1956, p. 8):

"The phonemes of a language are not sounds but merely sound features lumped together which the speakers have been trained to produce and recognize in the current of speech sounds

..... The speaker has learned to make sound-producing movements in such a way that the distinctive features are present in the sound waves, and the listener has learned to extract them from these waves.

(Ibid., p. 4) Each of the distinctive features involves a choice between two terms of an opposition that displays a specific differential property, diverging from the properties of all other oppositions.

(Ibid., p. 5) If the listener receives a message in a language he knows, he correlates it with the code at hand and this code includes all the distinctive features to be manipulated, all their admissible combinations into bundles of concurrent features termed phonemes."

It follows from this that vowels and consonants are made up of the distinctive features which are used in a given language. Thus in Arabic voicing is a feature which is found in all vowels and some consonants.

In the following table we shall display the phonetic features recognized in al-Kitāb, and their specification with regard to the sounds discussed therein. In my opinion, the main features given in this book are seven: jahr, yunnah (nasality), madd (length), ʃiddah (total restriction or stoppage), ʔinʔira:f (laterality), takri:r (trilling), ʔiʔba:q (velarization, emphasis). As for the first feature, the sound which is positively specified with regard to jahr is called majhū:r, the one negatively specified with regard to this feature is called Yayr majhu:r or mahmu:s. As regards yunnah, the nasal are called fi:hi Yunnah (ʔayann is the term used by later phonetician Ibn Jinni) the non nasals are described as laysa fi:hi yunnah (al-Kitāb, II, p. 416). As for madd, only a:, i:, and u: are referred to as ʔuru:f madd wa li:n (we call them Mamdu:d), the rest are "laysat ʔuru:f madd" (ibid. p. 409). Regarding ʃiddah the non continuant sounds are termed as ʃadi:dah, the continuant ones are called Yayr ʃadi:dah or raxwah. The lateral sound is termed munʔarif, the rolled one mukarrar. Concerning ʔiʔba:q, the emphatic sounds are termed muʔbaqah, the non emphatic ones munfatiʔah or Yayr muʔbaqah (ibid., II, 426). It appears that Sibawaihi uses terms such as mahmu:s, raxw (or rixw), munfatiʔ in a negative way in contrast with the positive specifications. In the table below the sign "+" indicates the presence of the feature (positive), "-" indicates its absence (negative). The phonetic features of Arabic are represented in the form of a two-dimensional matrix in which the columns stand for independent segments; the rows stand for particular features.

Key of abbreviations

<u>Abbreviation</u>	<u>Full term</u>	<u>Glosses</u>
maj	majhu:r	voiced
ʔay	ʔayann	nasal
mam	mamdu:d	long
ʃad	ʃadi:d	non-continuant
mun	munʔarif	lateral
muk	mukarrar	rolled
mut	mutbaq	emphatic

The sounds which are characterized by Sibawaihi in a different way from the modern one will be inserted between parentheses to differentiate them from the rest of the sounds.

It is to be noted that the information given in the above matrix is reconstructed from the statements made by Sibawaihi. They are numerous, but we can cite some of them for illustrative purposes.

- 1) "Without ʔiṭba:q ṭ would become d, ʂ would become s, ʕ would become ʔ (al-Kitāb, II, p. 406)."
- 2) "d is like ṭ in that they both are Maj; t is not Maj (=Mahmū:s)... (Ibid., p. 418)."
- 3) "d and t differ in terms of Jahr; they are both lacking ʔiṭba:q, ʔistiṭa:lah (continuantness), and takri:r (ibid., p. 418)."
- 4) "ʂ in relation to z and s is similar to ṭ in relation to d and t. ʂ in relation to s is like ṭ in relation to d; because they are both Mahmū:s. What makes them different is the presence of ʔiṭba:q in ʂ and its absence in the case of s. As for ʂ in relation to z, it is like ṭ in relation to t, because z is ʔayr mahmu:sah (=Maj)... (ibid., p. 418)."
- 5) "ʔ to ʔ is like ṭ to d because they are all Maj. What distinguishes one from the other is the presence of ʔiṭba:q in the former part of the sets and its absence from the latter. ʔ to ʔ is like ṭ to t (ibid., pp. 418-419)."
- 6) "z is like d in that they both are Maj and non-Muṭ..... (ibid., p. 412)."
- 7) "z is Maj and ʔayr Muṭ..... (ibid., p. 426)."
- 8) "s and ʂ are alike in terms of hams, ʕafi:r (whistling) and raxa:wah (continuantness)... (ibid., p. 428)."
- 9) "s is near to t in terms of point of articulation, and in that they both are mahmu:s... (ibid., p. 429)."

The implications of the use of "distinctive feature analysis" are numerous; some of which are summarized below. The system which uses "feature analysis" uses a small set of features far less in number than the set of sound units employed in the language. Thus whereas one would need more than 29 units for Arabic, one might need 10 or 12 features in order to analyse the Arabic sounds in a more economical way. Moreover, the study of sounds in terms of their feature components would lead to avoiding redundant features; Sibawaihi seems to put emphasis on the distinctive, non-redundant, features. This approach appears to underlie his analysis as can be read between the lines of the above statements and many others.

Furthermore, by using "feature analysis" one can simplify his statement of the "morphophonemic" processes in the language, such as assimilation, dissimilation, etc. It is worth noting that after his major classification of Arabic sounds, Sibawaihi made the following remark (al-Kitāb, II, pp. 406-407):

"I have described the sound units in terms of the foregoing features in order to show you the cases in which Idghām is preferable, the cases in which it is permissible, and the cases in which it is neither preferable nor permissible."

Idghām here may be regarded as a part of the morphophonemic changes in Arabic. In fact, Sibawaihi's book contains a great number of morphophonemic statements. They are simply and concisely stated. They can easily be recast in mathematical linguistic formulas, or rules. To exemplify, examine Sibawaihi's statements as shown below.

"n is changed into m before b... because both b and m have the same point of articulation (al-Kitāb, II, p. 414; also on p. 427)."

This statement can be formulated as follows:

$$n \rightarrow [+bilabial] / \text{---} b$$

This rule is an instruction to add the feature of Labiality to the features that compose n before the Bilabial consonant. The symbol "→" reads: "rewrite the elements on the left of the arrow as the elements given on its right", the symbol "/" means "in the context of", the symbol "—" indicates the environment in which the change occurs.

Note also the following statement:

"The Arabs say ʔijdamāʔu: in place of ʔijtamāʔu:... t is approximated to d since this is Maj. This operation applies to the pattern ʔiFtaʔaL forms (Ibid., p. 427)."

This statement can be recast in this form:

$$t \rightarrow [+Maj] / [Maj] \text{---} \quad \text{and} \quad / \text{ʔiFtaʔaL}$$

i.e., add the feature Maj to the features which constitute t after a Maj consonant. This operation is restricted to forms of ʔiFtaʔaL pattern; the rule contains two environments symbolized by "/": the first refers to the segment next to which the operation takes place, the second refers to the general pattern which normally undergoes this kind of morpho-phonemic alternation.

The phenomenon of Deletion Ḥaḍf is also one of the morphophonemic operations. In this regard Sibawaihi makes a number of statements one of which reads:

"In the case of a succession of two t's as in tatakallamu:n ... one has the choice of maintaining it in speech or eliding one of them (ibid., p. 425)."

This statement can be stated in this formula:

ta - \emptyset / # ——— ta (Opt)

The symbol " \emptyset " indicates Deletion or zeroness; the symbol "#" stands for word-initial position; (Opt) means that this rule is applied optionally in Arabic.

After this long, though not exhaustive, survey of the phonetic conception as revealed in al-Kitāb we can make some general remarks rather briefly. Al-Kitāb remains a mine of information on Arabic grammar. Only very few, albeit the most important, concepts are discussed in this article. There remains a great number of phonetic statements which deserve further consideration and closer examination.

Although Sibawaihi generally gives a good and clear description of the consonants and vowels of Arabic, he does not mention anything which might relate to stress (accent or prominence), pitch and intonation. Later Arab phoneticians add to, and improve upon, Sibawaihi's description; though not in any significant way. In the 4th century A.H. (10th century A.D.) Abu al-Fath 'Uthmān Ibn Jinni gives a fuller and more systematic description of the Arabic sounds. I have found that he touches upon certain features in Arabic which may be grouped under the phenomenon

"stress". In his Sirr al-Ṣinā'ah, he presents a more systematic treatment of the short vowels; he also explicitly discusses some phonetic features which are either untouched by Sibawaihi or given a very cursory treatment.

Sibawaihi is a good observer. Lacking the more sophisticated techniques and modern technology, he depends solely upon his natural senses. Whenever necessary he makes use of these tools for experimentation. He is aware of the fact that in Arabic speech the pulmonic air escapes either from the mouth (orally) or from the nose (nasally). To make sure that n and m are nasals, he suggests this test:

"As for n and m, they are articulated in the mouth but have nasal resonance (ṡunnah). As a proof, hold your nose and try to utter them. You will not be able to do so (al-kitāb, II, p. 405)."

A similar statement is also made on p. 406 in the same volume. Other phonetic tests on Arabic are found scattered elsewhere. They merit a closer study in a separate article.

Conclusions

To recapitulate, the following points are noted.

Firstly: Sibawaihi gives a fairly accurate description of the Arabic sounds, both standard and colloquial. Although he does not mention vocal cords, he seems to be aware of the effect they produce on the ears; hence the division of sounds into Majhu:r and Mahmu:s.

- Secondly: He follows a framework which is based on "feature analysis". By doing so, he seems to have anticipated the most recent technique of feature analysis as proposed by Jakobson, Fant and Halle and later developed by Chomsky and Halle in their monumental work "Sound Pattern of English".
- Thirdly: In addition to the valuable phonetic information given in al-Kitāb, Sibawaihi keeps closely to a certain methodological plan. He uses the phonetic terminology or vocabulary with a striking degree of consistency and clarity. Further, whenever possible he uses the phonetically ascending order of sounds.
- Fourthly: Sibawaihi has laid down the phonetic rules which deal with the sound pattern of Arabic. One can find in his book a number of statements regarding the phonotactic arrangements of Arabic sounds, and the morphophonemic alternations that occur in the language.
- Fifthly: Apart from the many advantages and merits which characterize Sibawaihi's analysis of Arabic sounds, little is said about the short vowels in a systematic way. Moreover, he overlooks some of the most important prosodic features such as stress, pitch and intonation.

Sibawaihi's contribution to Arabic phonetics cannot be ignored by any researcher in this field. Nor can it be overlooked by the historians of linguistics who are interested in the development of this science in all parts of the world. Unfortunately, this early Arab phonetician has been misquoted and his ideas have been misinterpreted by later scholars in the East and the West. In passing I must refer to a work by a German scholar, A. Schaade, who, to my mind, wrote the most comprehensive work on Sibawaihi's phonetics. His study is entitled *Sibawaihi's Lautlehre*, published in Leiden in 1911, in about 100 pp.

It is also unfortunate that Arabic phonetics (not *Tajwīd*) is still in its infancy, and has not changed in a significant way from its traditional form. It is still an academic subject in many Arab countries. Sibawaihi's phonetics is still the main source for modern Arabic phonetics, it feeds it with its rich terminology, its ideas, and its methodology. Arabic phonetics can be applied in various ways in order to make us aware of this social phenomenon, speech. The pronunciation of Arabic, especially classical or standard Arabic, can be taught to school children and pupils; it can be taught to non-Arabic speaking people so that they will be able to speak Arabic like the Arabs; and it can be taught to students of speech, theatre, and public speakers in order to train them how to control their breath and articulate sounds properly and more effectively. One of the tasks of Arabic phonetics is to devise written symbols for all the possible sounds in Arabic. We have noted that Sibawaihi mentions a number of sounds which have no corresponding written symbols.

This is Sibawaihi, the phonetician. I have tried to give a simple, but comprehensive, picture of this Muslim scholar who for centuries has been the leading figure in the study of Arabic grammar. His work was first published and first translated

(into German) in the West. His "Bāb-ul-Idgham" is nothing but a chapter on Arabic phonetics. His contribution reflects the painstaking effort made through his clever observations, his effort in gathering and arranging the material, and above all his effort to state his ideas clearly and concisely. It is high time to appreciate more fully the achievement made by this scholar. Not only because he is an Arab phonetician, and not only because he is a Muslim sage, but also because he is one of the early human thinkers and scholars. It is the task of modern Arab linguists and phoneticians to co-ordinate their efforts in order to understand the man and his work more fully and to spread and further the knowledge of this man through his work among a wider audience in a more acceptable and interesting presentation.⁽³⁾

Footnotes

- (1) Where phonetic transcription is needed, I have used those symbols of the International Phonetic Alphabet (IPA) as given in the table at the beginning of this paper. I have also employed in the transcription of names and Arabic phonetic terms the following symbols:
- (The macron) above the vowel denotes the vowel length. Thus ā is the long counterpart of the short vowel a.
 - The raised coma stands for the consonant "ع".
 - The dot below h renders it a pharyngeal consonant. When the dot is below s, t, d, z, it denotes velarization or emphaticness.
 - The apostrophe stands for the Glottal stop, i.e. hamza.
- (2) I am sure that the arrangement given above by Sibawaihi is an error on the part of the early scribes. In a later statement, Sibawaihi orders q before k in terms of point of articulation. For this see p. 5 in this article.
- (3) This paper was supported by a grant from the University of Riyadh, during my Sabbatical year 1980/1981.

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