

John Wilkins' Classifications and Descriptions of Consonants in *An Essay towards a Real Character, and a Philosophical Language* (1668)

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1. Introduction

In 17-century England, under the influence of rationalism, a certain group of grammarians shifted their focus to the theoretical observation and the systematization of sounds, and developed an interest in general phonetic alphabets rather than their particular languages. Inspired by the fervent desire for scientific investigation and the systematic phonetic descriptions of sounds, they “felt free to challenge and modify the grammatical model enshrined in” Greek and Latin grammarians, such as “Priscian and Donatus,” the model which many grammarians had been kept shackled by so far (Robins 135). They labored to establish a different improved phonetic framework based on their own notion of sounds. Though, considered from the modern standard, their observation of sounds was still premature, they made a remarkable contribution to the development of modern phonetics (Lehnert, “Anfänge” 163) as the “precursors of modern

approaches” (Kemp, “Phonetics” 3102-16).

One of the most influential grammarians who attempted to hold scientific inquiries into the sounds of languages was John Wallis (1616-1703). His systematic classification of sounds in *Tractatus de Loquela* prefixed to *Grammatica Linguae Anglicanae* (1st ed. 1653) far excels those of the current grammarians and presages the modern framework of sounds.¹ His description and classification of sounds nonetheless possesses numerous minor defects, such as inaccurate descriptions of individual sounds due to his insufficient understanding of them, inappropriate classification of particular sounds induced by his extremely insatiable desire for the orderly arrangement of sounds (Lehnert, *Grammatik* 62-69).

This poses some significant questions as to what sorts of characteristic features are embodied by the descriptions and classifications of sounds made by other current grammarians who made a similar attempt to classify

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sounds, and whether these sorts of defects can be detected in them. As the object of this research, one of the grammarians who deserve particular treatment is John Wilkins (1614-72), who belonged to the same generation and social class as Wallis. He was one of the founders of the Royal Society like Wallis and “in fact a close associate of Wallis’s” (Dobson 1:254). In his pioneering work on universal language *An Essay towards a Real Character; and a Philosophical Language* (1668), acknowledging his debt to Wallis (Kemp, “phonetics” 3106), he presents a highly organized framework for sounds which entitles him to rank only a little below Wallis as a distinguished phonetician.

Among the linguistic researches concerning his sounds, though most of them are rather brief, a comprehensive one is conducted by E. J. Dobson in his *English Pronunciation 1500-1700*, 2nd ed. (1968) (1: 253-61).² Since his critical observation is devoted largely to a thorough elucidation of current sounds rather than to grammarians’ descriptions of sounds, there have been so far no comprehensive and detailed researches regarding Wilkins’ classifications and descriptions of sounds. On those issues, especially that of consonants, this research is more sharply focused, with the aim of discussing the above questions at length. With a view to illuminating the following discussion, Wallis’ classification of sounds is to be briefly dealt with in the next chapter prior to a thorough inquiry into that of Wilkins.

2. Wallis’ Classification of Sounds

In *Tractatus de Loquela* prefixed to *Grammatica Linguae Anglicanae*, Wallis adopts a 3 × 3 vowel-division horizontally and vertically, based on two criteria: the aperture of the mouth and the place of articulation (See Table 1).³ Vowels on the horizontal axis are classified into *Majori*, *Media*, and *Minori* according to the aperture of the mouth, and on the vertical axis into *Labiales* (the vowels formed at the lips), *Palatinae* (those in the palate), and *Gutturales* (those in the throat) according to the place of articulation (5). He then attempts to apply this 3 × 3 framework of vowels into consonants by establishing further threefold divisions. Like vowels, consonants are vertically trichotomized into *Labiales*, *Palatinae*, and *Gutturales* according the place of articulation, with each of the divisions further trichotomized into *Muta* (the modern category of oral voiceless consonants), *Semi-muta* (that of oral voiced ones), and *Semi-vocalis* (that of nasal voiced ones) according to the direction of the breath, which is conceived to be essentially determined by the position of the uvula. Wallis describes the breath of: (a) *Muta* as entirely directed into the mouth to escape through the lips; (b) *Semi-muta* as divided equally between the mouth and the nose; (c) *Semi-vocalis* as almost entirely directed into the nose to escape through the nostrils (13-14). The confusing criterion of this trichotomy, not followed by the modern voiced / voiceless distinction, requires further discussion though it does not

Table 1.

Wallis' Classification of Simple Sounds

Vocales			
	Apertura		
	Majiori	Media	Minori
Gutturals	<i>ā</i> aperta	<i>e</i> foemininum	<i>ū</i> obscurum
	<i>ō</i> aperta		<i>ò</i> obscurum
Palatinae	<i>ā</i> exile	<i>e</i> masculinum	<i>ee</i> exile <i>i</i> exile
Labiales	<i>ō</i> rotundum	<i>oo</i> pingue <i>ū</i> pingue	<i>ū</i> exile

Consonae					
Labiales	Muta	P [p]	F [ϕ] (or [f])	F [ϙ]	
	Semi-muta	B [b]	V [β] (or [v])	W [w]	
	Semi-vocalis	M [m]	Mugitus		
Palatinae	Muta	T [t]	S [s]	Th [θ]	
	Semi-muta	D [d]	Z [z]	Dh [ð]	L [l] R [r]
	Semi-vocalis	N [n]	Gemitus		
Gutturales	Muta	C [k]	Ch [tʃ]	H [h]	
	Semi-muta	G [g]	Gh [dʒ]	Y [j]	
	Semi-vocalis	Ñ [ɲ]	Groan		
			Subtiliores	Pinguiores	
Primitivas (Clausas)			Derivatives (Apertas)		

Sources: Wallis 35.

^a Some additions to the original table in Wallis 35 are made. Assumed consonantal values are added in square brackets.

fall within the province of the present research.⁴

Consonants are horizontally divided into two categories: *Primitivas* or *Clausas* for the consonants pronounced with the breath completely intercepted, and *Derivatives* or *Apertas* for the aspirated counterparts of *Primitivas* with the breath strongly com-

pressed but still having a way of escaping. *Derivatives* are further divided, by the shape of the orifice through which the breath escapes, into *Subtiliores* or *Tenuiores* for the *Derivatives* with the breath escaping "through an oblong small cleft" ("per rimulam oblongam"), and *Crassiores* or *Pinguiores* for those with

the breath escaping “through a round quasi-hole” (“per rotundum quasi foramen”) (18). Despite the two successive binary divisions, the whole horizontal consonantal classification, whose criteria correspond to the manner of articulation, seems to retain a ternary system except for *L* [l] and *R* [r].

Martin Lehnert in his monograph *Die Grammatik des englischen Sprachmeisters John Wallis (1616-1703)* claims Wallis, as one of the founders of phonetic science, makes an epoch-making contribution to progress in the classification of sounds by contriving the new 3 × 3 scheme of vowels, foreshadowing the modern phonetic system (64).⁵ His insatiable desire, however, for systematizing the phonetic framework occasionally incurs fallacies, such as the misplacement of *e foemininum* [ə] into *Gutturales*, the misinterpretation of the tongue-position of *Labiales* (Dobson 1: 227; Ekwall 88). His rigid scheme also causes clumsy approaches to consonants. For instance, the consonants *F* and *V* are classified under *Labiales* as bilabial ([p] and [β]) not labio-dental consonants, for the latter of which no categories are devised (Dobson 1: 231). These assessed phonetic values are strengthened by his definition of *Labiales* as those formed by the lips (“prout labiis, . . . formantur”) (13). The possibility that his ternary division into *Muta*, *Semi-muta*, *Semi-vocales* might be an instance of clumsiness due to systematization is also suggested by Dobson (1: 231).

Also attested are errors in articulatory descriptions, such as his misinterpretation of

the four consonants *dy* [dʒ] in “jar,” “joy,” “gentle,” *ty* [tʃ] in “Orchard,” “riches,” *zy* [ʒ] in French “je,” “age,” and *sh* [ʃ] in “shame” as compound sounds (37-39), of the *Pinguiores* form of *P*, assumed to be [ʌ], as the sound approximate to [f] (19).

3. Wilkins' Classifications and Descriptions of Sounds

3.1. Wilkins' Description of the Organs of Speech

In his explanation of “Causes of Letters” in section 2, Chapter 10 of *An Essay*, Wilkins classifies the organs of speech into two broad groups: *common* and *peculiar* organs, bringing the lungs, the throat, the mouth, and the nose into the former group and the palate, the teeth, and the lips into the latter. The latter group consists of a further twofold subdivision into passive and active organs, the former ones he enumerates being the palate, the teeth and the lips, and the latter being the tongue and the lips (359). This subdivision substantially assumes an extremely modern aspect though no mention is made of the vocal folds in his description. His graphic illustration of the face-in-profile of a person pronouncing individual sounds in chapter 14 shows that he notices the existence of the epiglottis, the larynx, the “Aspera Arteria,” viz. the wind pipe, and the oesophagus (378).

These speech organs are considered to have three major actions, the modern counterpart of the manners of articulation: *Appulse*, *Trepidation*, and *Percolation*. Each action is classified according to the movements of the

lips and the tongue. *Appulse* is described as the approach of the lip either to the other lip or to the tops of the teeth, that of the top of the tongue to the teeth, etc. *Trepidation* is the vibration caused by the lips, or by the tongue. *Percolation* of the breath is between the contracted lips, or between the top of the tongue and the top of the teeth, etc. (359).

Wilkins employs the terms *sonorous* and *mute* to refer to voiced and voiceless consonants respectively. He defines the *sonorous* consonants as those which "require some voice or vocal sound, to the framing of them," and *mutēs* as those "of the same configuration, pronounced with a strong emission of the Breath, without any Vocal sound" (366). Despite his fair knowledge of their distinction, he wrongly attributes sonorousness or voicing to the motion of the epiglottis. It is also attested by his graphical illustration of the face-in-profile of a person (378).

3.2. Wilkins' Definitions of Vowels and Consonants and His Classifications of Sounds

Vowels and Consonants are termed by Wilkins "Apertae" and "Clausae Literae" (366). Vowels are defined as sounds "in pronouncing of which by the Instruments of Speech, the breath is freely emitted" (363), whereas consonants are defined as sounds "in the pronouncing of which the Breath is intercepted, by some Collision or Closure, amongst the Instruments of Speech" (366).

The first rational classification of all simple sounds Wilkins presents in a tabular form in

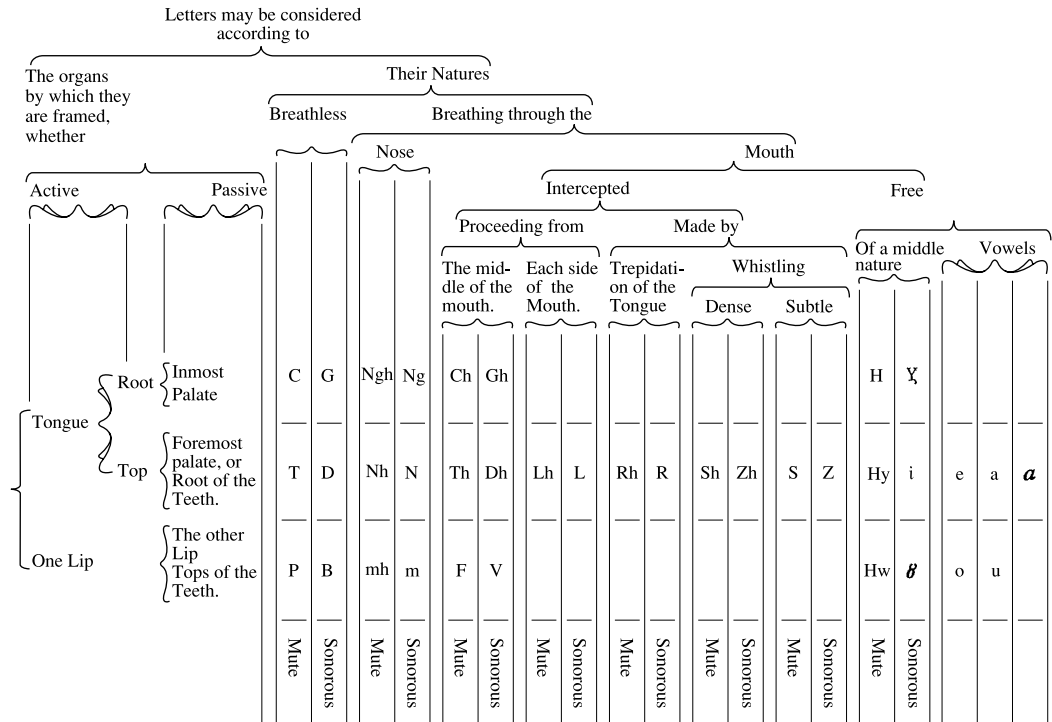
section 2, chapter 10 is based mostly on a binary system designed on two criteria for classifying sounds: the type of speech organs by which they are framed on its vertical axis and the nature of sounds on its horizontal axis (See Table 2) (358). On its vertical axis, according to the criteria, viz. activity and passivity of speech organs, speech sounds are finally divided into three types: the sounds pronounced between the root of the tongue as an active articulator and the inmost palate as a passive articulator, those between the top of the tongue and the foremost palate or the root of the tongue, and those between one lip and the other lip or the tops of the teeth.

Its horizontal axis is unexceptionally constructed on binary classification. All simple sounds are first dichotomized into breathed and *breathless* ones, next breathed ones into nasals and orals, and then orals into *intercepted* and *free* sounds. *Free* sounds are subdivided into vowels and the sounds of "a middle nature," the latter of which includes what are presently termed half vowels. There remains some ambiguity concerning the criteria for further dichotomy of intercepted sounds, especially the criterion for dividing intercepted sounds made by whistling into *dense* and *subtle* sounds. These auditory not articulatory terms *dense* and *subtle* are in the Greco-Latin tradition which was still current among contemporary grammarians.

The second tabular classification of all simple sounds which Wilkins bases upon the organs of speech in section 3, chapter 10 (360-

Table 2.

Wilkins' Classification of Simple Sounds in Section 2, Chapter 10 (CL1)



Sources: Wilkins 358.

62), bears a striking resemblance to that in section 2, chapter 10, but differs slightly from it in the division and the order of classification (See Table 3). The former and the latter classification will be for convenience called CL2 and CL1 respectively below. CL2, composed of different binary and ternary divisions, starts with a dichotomy into *apert* and *intercepted* sounds, followed by an additional dichotomy of both sounds into *greater* and *lesser* sounds according to the degree of aperture. The detailed articulatory description of individual sounds provided by Wilkins in CL2, omitted in Table 2, will be discussed

in the following section. Wilkins draws clear distinctions between *Dh*, *Th* and *L*, *Hl*, and between *D*, *T* and *G*, *C* in his articulatory depictions, though he also retains the auditory terms *subtle* and *dense* to clarify the distinction between *Z*, *S* and *Zh*, *Sh*.⁶

His description of further subdivision lacks coherency. Whereas in CL1 the sounds *H*, *Y* are placed in the same category as the consonants *C*, *G*, *Ngh*, *Ng*, *Ch*, *Gh* as the sounds framed by the root of the tongue and the inmost palate, in CL2 the first two sounds form the newly established category of *guttural*, though the last six consonants are described

Table 3.
Wilkins' Classification of Simple Sounds in Section 3, Chapter 10 (CL2)

1. Apert and Free	
1. 1. Greater	
1. 1. 1. Labial	Less: <i>o</i> More: <i>u</i>
1. 1. 2. Lingual	More concave: <i>α</i> Less concave: <i>α</i> Somewhat concave: <i>e</i>
1. 2. Leßer	
1. 2. 1. Sonorous	Labial: <i>θ</i> [w] ([ʋ], or [u:]) Lingual: <i>ι</i> [j] ([i], or [i:]) Guttural: <i>ϑ</i>
1. 2. 2. Mute	Labial: <i>hθ</i> or <i>θh</i> [ʌ] Lingual: hi [ç] Guttural: <i>h</i> [h]
2. Intercepted and shut	
2. 1. Leßer	
2. 1. 1. Labial	
2. 1. 1. 1. Mouth	Appulse: <i>V</i> [v] (Sonorous), <i>F</i> [f] (Mute) Trepidation: the sound used in the driving of cows (Sonorous) Interjection of disdain (Mute) Percolation: vocal whistling (Sonorous) mute whistling (Mute)
2. 1. 1. 2. Nose	<i>M</i> [m] (Sonorous), <i>HM</i> [m̥] (Mute)
2. 1. 2. Lingual	
2. 1. 2. 1. Top of the Tongue (Active Organ)	
2. 1. 2. 1. 1. Mouth	Appulse: <i>Dh</i> [ð] (Sonorous), <i>Th</i> [θ] (Mute) <i>L</i> [l] (Sonorous), <i>Hl</i> [l̥] (Mute) Trepidation: <i>R</i> [r] (Sonorous), <i>HR</i> [r̥] (Mute) Percolation: <i>Z</i> [z] (Sonorous), <i>S</i> [s] (Mute) <i>Zh</i> [ʒ] (Sonorous), <i>Sh</i> [ʃ] (Mute)
2. 1. 2. 1. 2. Nose	<i>N</i> [n] (Sonorous), <i>HN</i> [n̥] (Mute)
2. 1. 2. 2. Root or Middle of the Tongue	
2. 1. 2. 2. 1. Mouth	Appulse: <i>Gh</i> [ɣ] (Sonorous), <i>Ch</i> [χ] (Mute) Trepidation: a sound like the snarling of a dog (Sonorous) the sound like that motion we make in hacking (Mute) Percolation: a sound like the hissing of a goose (mute)
2. 1. 2. 2. 2. Nose	<i>NG</i> [ŋ] (Sonorous), <i>NGH</i> [ŋ̥] (Mute)
2. 2. Greater	
2. 2. 1. Labial	<i>B</i> [b] (Sonorous), <i>P</i> [p] (Mute)
2. 2. 2. Lingual	<i>D</i> [d] (Sonorous), <i>T</i> [t] (Mute) <i>G</i> [g] (Sonorous), <i>C</i> [k] (Mute)

Sources: Wilkins 369-62

^AThis table is reconstructed after the table in Wilkins 369-62 with their articulatory descriptions excluded. Assumed consonantal values are added in square brackets.

in the same manner as CL1. Another incoherent description is attested by the order of subdivisions of the *lesser* types of *apert* sounds in CL2. These sounds there are first classified into *sonorous* and *mute* sounds, then into *labials*, *linguals*, and *gutturals*, unlike intercepted sounds categorized in a consistently reverse order. These instances of incoherency might result from Wilkins' classificatory errors, or, if on purpose, from his express intention to differentiate vowel-classification from consonant-classification due to his recognition of their articulatory distinction.

In chapters 11-13, Wilkins gives a comprehensive and detailed account of vowels, consonants, and compound letters, such as their definitions, their properties (366-69). Though he does not show much concern for classifying sounds here, especially vowels, rough classification of all consonants in chapter 12, which will be for convenience called CL3 below, deserves particular attention. Dissatisfied with the traditional division into *semi-vowels* and *mutés*, he introduces a three-way classification based upon the degree of breathing: put in decreasing order of breathing, *Spiritous*, *Semi-Spiritous*, and *Non-spiritous*. The *spirituous* consonants are considered to be "Breathed" ones, as "require to the framing of them a more strong emission of the Breath." They "have some imperfect sound of their own, without the joining of any Vowel with them" (368). They are subdivided into two groups: orals, such as *V, Dh, Gh, L, R, Z, Zh, F, Th, Ch, Lh, Rh, S, Sh*, and nasals, such as *M, N, Ng, Mh, Nh, Ngh*. The

semi-spiritous consonants, presently categorized as voiced oral stops, are "half Breathed Consonants," "such as are accompanied with some kind of vocal murmur, as B, D, G," whereas the *non-spiritous* consonants, presently categorized as voiceless oral stops, are "breathless" ones, "which are wholly mute; as, P, T, C" (369). Wilkins' more elaborate explanation of the articulation of each consonant in CL3 will be critically examined in the next section of this paper.

Section 2, chapter 10 is devoted to an additional cursory treatment of all the simple sounds for the purpose of proposing a real character contrived on a philosophical ground. Since the broad phonetic classification he arranges there, which will be termed CL4 below, has the same fundamental structure as CL2 apart from the order of division, a required minimum of reference to CL4 is to be given.

A comparison of the first three classifications above reveals a categorical inconsistency among them: oral stops, whether voiced or voiceless, are marked by complete breathlessness in CL1 and CL2, while only oral voiceless stops are marked by complete breathlessness, but oral voiced stops by half breathing in CL3.

Unlike Wallis, instead of constructing a rigorously systematic framework, Wilkins ingeniously forms the whole framework of consonants independently from that of vowels by establishing as many categories as are required according to rather articulatory criteria based on active and passive articulators, especially the place

and the manner of articulation. Consequently, one does not find any classificatory errors due to extreme systematization. Several errors originate in lack of unity among the various classifications he attempts for different purposes.

3.3. Wilkins' Descriptions of Individual Consonants

3.3.1. Nasal *Spiritous* Consonants: *M*, *N*, *Ng*, *Mh*, *Nh*, *Ngh*

The consonants *M* [m], *N* [n], and *Ng* [ŋ] are explained as the *sonorous* or voiced types of the nasal *spirituous* consonants, and *Mh*, *Nh*, and *Ngh* as the *mute* or voiceless counterparts. Unlike Wallis, Wilkins recognizes the possibility of voiceless nasal consonants (Kemp, "Phonetics" 3106). The pronunciation of *M* [m] is described in CL3 as follows; "(*m*) is *mugitus*, the natural sound of *Lowing*, when the Lips are shut, and the sound proceeds out of the Nose" (366). The articulatory descriptions, however, of this consonant in CL2 and CL3 are not entirely in agreement; in CL2 the potential sound of the consonant can be interpreted not only as bilabial but also as labio-dental from his description of its pronunciation by "an appulse; either of the Lips against one another: or against the top of the Teeth" (361). No indication is provided as to whether this labio-dental sound is the variant of [m] which occurs when followed by a labio-dental sound [f] or [v], e.g. in *nymph*, *triumph*, *circumvent* (Gimson 177).

The consonant *N* [n] is regarded as alveolar in CL3 as follows; "(*N*) is *Tinnitus*, when the

breath is sent out, the Limbus [edge] of the Tongue being fixed towards the Gums, or bottom of the upper Foreteeth" (366). The consonant *Ng* [ŋ] is described as "framed by an appulse of the Root of the Tongue towards the inner part of the Palate" in CL3 (367). It is properly recognized as a single sound, not "a compound of n, and g" (367). The above articulatory descriptions of the consonants *N* and *Ng* agree exactly with those in CL2 (361).

3.3.2. Oral *Spiritous* Consonants: *V*, *Dh*, *Gh*, *L*, *R*, *Z*, *Zh*, *F*, *Th*, *Ch*, *Lh*, *Rh*, *S*, *Sh*

The consonants *V* [v] and *F* [f] are conceived by Wilkins to be "B *aspirated*, or rather *incrasated*" and the "incrasation of the Letter (P)" respectively (367). The consonants *Dh* [ð] and *Th* [θ] are likewise considered to be "D, & T, aspirated or incrasated" (368). This classificatory interpretation of *Dh* and *Th* closely parallels Wallis' interpretation of them as the *Pinguioris* or *Aspirata* form of *D* and *T* respectively, but Wallis regards *V* and *F* as the *Subtilioris* or *Aspirata* form of *B* and *P*. The consonants *Gh* and *Ch* are explained in CL3 as "framed by a vibration of the root or middle of the tongue against the Palate" (368), and in CL2 a little more neatly depicted as framed "by Appulse" of the "Root or middle of the Tongue" "to the inward Palate" (361). The phrase "to the inward Palate" testifies that *Gh* and *Ch* assume their velar sound-values [ʒ] and [ʃ] respectively.

The above articulatory descriptions of *Gh* and *Ch* demonstrate their vacillation in the manner of articulation between *appulse* as

shown in CL2 and vibration or *trepidation* as in CL3. Another type of articulatory vacillation between *appulse* in CL2 and *percolation* in CL3 is attested as follows. The consonants *V* and *F* are depicted in CL3 as “framed by a kind of straining or percolation of the Breath, through a Chink between the lower lip and upper teeth” (367), but in CL2 as framed by the “Appulse of either lip to the opposite teeth” (360). Unlike Wallis, Wilkins gives an accurate depiction of this consonant as labiodental. The latter depiction carries the odd implication of its pronunciation between the upper lip and the lower teeth. The consonants *Dh* and *Th* are described in CL3 as “framed by a percolation of the Breath through a kind of Chink betwixt the tongue and upper teeth” (368), whereas they are a little more minutely portrayed in CL2 as framed by the “Appulse, of the top of the Tongue, to the Top of the Teeth; the breath being emitted through the middle of the Mouth” (361). In CL4, they are classified among *appulse* sounds as in CL2.

The consonants *Z* [z] and *S* [s], termed “*S molle*” and “*Sibilus*” respectively, are both described in CL3 as “framed by an Appulse of the tongue towards the upper Teeth or Gums, and then forcing out the breath from betwixt the tongue and the upper teeth” (369). *Z* is considered to assume the auditory property of “a more dense kind hissing” (369). The consonant *Zh* [ʒ] in the French word “*Jean*” and the correspondent mute *Sh* [ʃ], properly interpreted as simple sounds like *Ng*, are described in CL3 as “framed by a percolation of

the breath, betwixt the tongue rendered concave, and the teeth both upper and lower” (369).

Unlike CL3, reckoning the manners of articulation of *Z*, *S*, *Zh*, *Sh* as identical, Wilkins conceives them all to be pronounced by the “Percolation of the breath; between the top of the the [sic] Tongue, and the roots of the Teeth” in CL2 (361). The same manner of articulation is also indicated in CL4. He there draws a distinction between *Z*, *S* and *Zh*, *Sh* not so much by the concrete movements of the organs of speech as by the auditory terms *subtle* and *dense*, the former of which modifies *Z* and *S* and the latter *Zh* and *Sh* (361).

As for the consonant *L* [l], called *Clangor*, Wilkins properly recognizes its bilateral nature since he minutely describes *L* as pronounced by “Appulse, of the top of the Tongue, to the Foremost part of the Palate; the breath being emitted through the Corners of the mouth” in CL2 (361). The same though rather inadequate description of *L* is given in CL3 (368).

The consonants *R*, termed “*stridor*” or “*susurrus*,” and its voiceless counterpart *Rh* are depicted in CL3 as “made by a quick trepidation of the tip of the tongue being vibrated against the palate” (368), but in CL2 as produced by “*Trepidation or Vibration*” with the “*Top of the Tongue*” “against the inmost part of of [sic] the Palate” (361). The former articulatory description evidently testifies the nature of a point-trill, which was still used then intervocalically in English, as attested by most of the major seventeenth-century or-

thoepists, though the current consonant in other positions had already discarded the nature attested here, undergoing development from a point-trilled consonant to the present post-alveolar fricative (Dobson 2: 945-46). The latter description in CL2, involving some difficulty in determining their sound-values if literally interpreted, would require correction provided that Wilkins intends the same phonetic-value for this consonant as in CL3; one ought to read "the foremost part" for "the inmost part." The *lesser* type of voiced *intercepted* sound produced by *trepidation* with the "root of the tongue" as the active articulator in CL2 (361) corresponds to "a sound like the snarling of a dog" and consequently assumes the nature of a uvular trill though no letters are given to this consonant (Dobson 1: 256).

3.3.3. *Semi- and Non-spiritous* Consonants:

B, D, G, P, T, K

In CL3, Wilkins accurately describes the consonants *B* [b] and *P* [p] as "framed when the breath is intercepted by the closure of the Lips," *D* [d] and *T* [t] as "framed, by an ap-pulse or collision of the top of the tongue against the teeth, or upper gums," *G* [g] and *C* [k] as "framed more *inwardly*, by an interception of the breath towards the throat, by the middle or root of the tongue" (369). Minor discrepancies in the point of articulation are observed here between descriptions in CL2 and in CL3. The above passage is recognized as proof of *D* and *T* being dental or alveolar, whereas the passage depicting them as

formed by interception between the "Top" of the tongue and "the bottom of the Teeth" in CL2 is symptomatic of their dental property alone (362). The above articulatory account of *G* and *C* omits the passive organ of speech and mentions "the middle or root of the tongue" as the active organ of speech, whereas the depiction in CL2 identifies "the Root" of the tongue as the active organ of speech and "the inmost palate" as only a passive one (362). The voiced / voiceless distinction between these consonants is clarified in CL3 not only by the terms *sonorous* and *mute* but also by the auditory terms *soft* and *gentle* for the oral voiced stops and *hard* for the oral voiceless ones (369), the exact counterparts of the traditionally employed terms *lenes* and *fortes*.

3.3.4. Other Consonants

His symbols *Y* and *W*, termed "mediae potestatis" (360), the sounds of "a middle nature" (358), assume the properties of vowels [i], [i:] and [U], [u:] or half-vowels [j] and [w]. No clear distinction is given between them. The consonants *J* [dʒ] in "joy," "gentle" and *Ch* [tʃ] in "Charity, Cheese, Chosen" are inaccurately interpreted not as simple sounds but as "a Compound of D, and Zh" and "T, and Sh" due to his careless observation that "in the prolation of them, we do not end with the same sound with which we begin" (372). The misplacement of the glottal fricative *H* [h] in the category of *guttural* (358, 360) is a feature common to current grammarians, including Wallis, who have a limited capacity as

phoneticians for understanding glottal sounds.

3.3.5. Summary of Wilkins' Descriptions of Individual Consonants

Though generally with less detail than Wallis, Wilkins gives elaborate descriptions of the pronunciations of consonants. His phonetic depictions are superior in his interpretation of the consonants *V* and *F* as labio-dental, and his awareness of the possibility of voiceless nasal consonants. Wilkins attempts to give articulatory accounts of consonants, but still retains the auditory terms *subtle* and *dense* to draw a distinction between *Z*, *S* and *Zh*, *Sh*. Some errors are due to his inadequate recognition of consonants, such as his misinterpretation of [dʒ] and [tʃ] as compound consonants, his misplacement of [h] in the category of *guttural*, his lack of distinction between vowels [i], [u] and half-vowels [j], [w].

In the multiple classifications Wilkins establishes for various purposes, one has confirmed the following fluctuations in the articulatory descriptions of individual sounds; the first four inconsistencies below are involved in the manner of articulation and the last three in the place of articulation.

V and *F*: by *percolation* (CL3)

by *appulse* (CL2)

Dh and *Th*: by *percolation* (CL3)

by *appulse* (CL2 and CL4)

Gh and *Ch*: by *trepidation* (CL3)

by *appulse* (CL2)

Z and *S*: by *appulse* (CL3)

by *percolation* (CL2 and CL4)

M: bilabial (CL3)

bilabial or labio-dental (CL2)

D and *T*: dental or alveolar (CL3)

dental (CL2)

G and *C*: "the middle or root of the tongue" as the active articulator (CL3)

"the Root" of the tongue as the active articulator (CL2)

Wilkins' correlation of *appulse* with *percolation* is conceptually parallel with Wallis' correlation of *Primitivas* with *Derivatives*. It is practically the case with CL3 except for the classification of *Z* and *S* among *appulse*. In CL2, however, the category of *percolation* includes more consonants and that of *percolation* includes the fewer. As far as consonantal classification is concerned, CL3 is fundamentally based on Wallis' classification, while CL2 seems to be founded on Wilkins' own observation. Another example of his empirical observation is Wilkins' articulatory descriptions of *V*, *F*, *Dh*, *Th* in CL3. He regards all these consonants as *incrassated* consonants, the categorical counterpart of Wallis' *Crassiores* or *Pinguiores*. Wallis does not, however, place the four *incrassated* consonants above in the category of *Pinguiores*. In Wallis' framework, *F* and *V* forms the category of *Subtiliores* and *Th* and *Dh* that of *Pinguiores*.

Nonetheless, there is no denying that the unity of his whole framework is spoiled by the above descriptive fluctuations, including those in manner of articulation, which might be connected with his confusion between *ap-*

pulse and *percolation* owing to his ambiguous notion of both categories. He gives no satisfactory definition of *appulse*, so that his ambiguous notion of *appulse* does not preclude any possibility of placing stops and fricatives in the same category of *appulse*. Hence, in CL2 the category of *appulse* is comprised mainly of stops and fricatives other than *Z, S, Zh, Sh* and the category of *percolation* of the four fricatives and other consonants not necessary to be assigned to any 'letters', whereas in CL3 the former category consists mainly of stops and the latter category of fricatives (361).

4. Conclusion

Wilkins achieves greater success in consonantal classification than Wallis. His framework of consonants owes its success largely to his pragmatic approach to them independent from that to vowels. Instead of constructing as rigorous a systematic framework of consonants as that of vowels like Wallis, Wilkins establishes as many categories as are required according to articulatory criteria based on active and passive articulators, especially in the place and the manner of articulation. One thus observes no classificatory fallacies originating from extreme systematization. Wilkins also elaborates phonetic descriptions of the pronunciations of consonants, which are a little less detailed than Wallis on the whole, but are superior to him in his interpretation of [v] and [f] as labio-dental, his awareness of the possibility of voiceless nasals. His phonetic accounts of consonants are rather

articulatory, but still the impact of such classical grammarians is felt in the use of the auditory terms *subtle* and *dense* to draw a distinction between *Z, S* and *Zh, Sh*. Some of his errors are due to his inadequate recognition of consonants, such as his misinterpretation of [dʒ] and [tʃ] as compound consonants, his misplacement of [h] in the category of *gut-tural*, his lack of distinction between vowels [i], [u] and half-vowels [j], [w].

In the multiple classifications he establishes for various purposes are attested numerous inconsistencies, for instance, in the categorization of non-nasal stops between CL1, CL2 and CL3, and, if classified unintentionally, also in the order of subdivision of *lesser* type of *apert* sounds between CL1 and CL2, and in the categorization of the sounds *H*, and the consonants *G, C, Ng, Ngh, Gh, Ch*, between CL1 and CL2. Fluctuations in his description of consonants are chiefly ascribed to his confusion of the manners of articulation, especially between *appulse* and *percolation*. CL3 is fundamentally based on Wallis, whereas CL2, with several consonants assigned to different manners of articulation, proves to be founded on his own observation, presumably distorted by his ambiguous notion of *appulse* and *percolation*.

These inconsistencies reflect his descriptive confusion created during the course of his hard struggles to analyze sounds in a more scientific and articulatory manner and to re-form the conventional phonetic scheme handed down by classical grammarians. They can be regarded as the inevitable accompani-

ment to the pioneering endeavors made by contemporary grammarians guided by similar motives. Without them, their contribution to the development of modern phonetics in England could not be evaluated so highly.

Notes

- 1 The test used in this research is that of the 6th edition (1765) in my library, which is virtually identical with that of the 5th edition (1699), the last edition Wallis himself supervised (Kemp, *Wallis* [73]).
- 2 For other phonetic researches, see Kemp, "Phonetics" 3106.
- 3 To specify the place of articulation for each vowel, Wallis adopts the place where the air-stream is moderately compressed when it is pronounced (*Wallis* 6, 7, 10).
- 4 See Kemp, *Wallis* [52]-[54].
- 5 For the opposite views, see Ekwall 88; Kruisinga 362-63; Dobson 1: 226-27.
- 6 In our discussion, instead of phonetic transcriptions, alphabetic characters are used as phonetic symbols so as not to distort the sound-values intended by grammarians.

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