The paper traces the evolution of the vocalic subsystem from its Classical, Medieval, and Early Modern English alphabetic but inorganic order a e i o u to its organic but nonalphabetic scheme i e a o u. The essentials of the cardinal-vowel system date back to 1762.

Greek and Latin copied the alphabetic pattern of Hebrew. All Hebrew letters formed a macroalphabet or pansystem of names and meanings. Its purely consonantal acrophones and acrographs served as a microalphabetic pansystem of sound- and number-values. The practice of syllabography worked without scripting vowels. Eventually, sound-evolution vocalized acrophone Aleph, He, Waw, Yod, Ayin. They specified the new vowels as compounded names signalized psilon regularized the vocalic subsystem. After the vocalization, the Phoenician alphabet reached Greece. The Greeks sound-evolution vocalized acrophonic Aleph, He, Waw, Yod, Ayin 'just as his phono-

An early breakthrough in anatomic, organic, or phonetic letter-sounds of the microalphabet occurred between the 3rd and the 6th century AD. In the cabbalistic Sepher Yetzira or 'Book of Creation', an anonymous Talmud scholar classified letters according to the flow of their, bloodstream from throat to mouth.2 He identified the places of articulation as those stretches of the oral tract along the comparatively static or immovable speech-organ, which faced the protruding back, front, blade, or tip of the dynamic or movable tongue. Describing a purely consonantal alphabet, the Sepher Yetzira quite naturally skipped the (nonexistent) scripted Hebrew vowel-scheme. Yet in spite of its organic transplantation of dental after labials verbalized for consonants, a merely hypothetical classification of vowels according to the throat-to-mouth arrangement would suggest u o a e i.3

Although lingua as both 'tongue' and 'language' must remain of prime significance for anything linguistic, sub-sequent grammarians and commentators of the Sepher Yetzira could not fail to adjust the monocausal but poly-factorial model of vowel articulation. Dunash Ben Labrat (10th c) and Solomon Ibn Gabirol (11th c) improved the anatomic description of speech-organ and corrected the order of letter-sounds to gutturals, linguals, tectals (or tectals, linguals), dental, and labials.3

The ways and habits of Roman thinking as well as Patristic epistemology ignored the monocausal but poly-factorial considerations. Not only from Varro (1st cBC) via Tertullian (2nd/3rd cAD) to Donatus (4th cAD) and Priscian (early 6th cAD) did Roman and Latin grammarians hold on to the mnemonics of the vowel scheme a e i o u. Taking on trust any letter's harmony within nomen-figura-potestas, the everyday practice of the Latin Middle Ages managed to perpetuate alphabetic aspects in both Romania and Germany. Apart from the identical order of the vowels, the growing neutralization of vowel-length in Romania led to the alphabetic subscheme and mnemonic pattern a e i o u as against the lengths preserved a e i o u in Germany. For the phonemic and paradigmatic triad nomen-figura-potestas, Boniface (8th cAD) observed but underemphasized the phonetic and syntagmatic transience of contextual vocalization and coarticulation outside the microalphabet.

Aelfric's Grammar before 1000 presented the pansystem of the Latin alphabet, expressly adding the unaltered subsystem a e i o u.4 Byrht-ferth's Manual in 1011 appended a column with a vocalic A I O U.5 About 1150, the First Grammatical Treatise just integrated the Germanic unlauned tone-colours of Old Icelandic into an otherwise stable Latin scheme. Its alphabetic insertions followed graphic conventions and largely etymological antecedents.6 a, ø, o, e, 6, e, 6, i, 6, 6, o, 6, ø, u, y, y. Aelfric's Grammar and Byrhtferth's Manual based their vowel schemes upon the figurea or written shapes of the letters. Clinging to the alphabetic order it must have dawned upon the First Grammarians that inadvertent teachers of a harmonious Latin nomen-figura-potestas doctrine had been neglecting nomen and potestas.

An early insular attempt at considering articulatory and acoustic aspects of vocalic order stems from mid-13th-century Oxford. An Oxford Bodleian, a London British Libr, and a Paris Bibliothèque Nationale manuscript each hold some pseudo-Grosseteste treatise.7 Elaborating upon the Aristotelian differentiation of a vocalic sonus in motu from a consonantal sonus in potencia in the Bodleian Digby version, the pseudo-Grosseteste defined vowels as simpliciter and consonants as secundum quid. A vowel's 'substantial' movement (motus) flows without any obstruction, whilst a consonant's 'accidental' motion takes shape from an obstruction at one or more of the speech-organs. With all its inconsistencies, a further treatise by the Digby phonetician (in accordance with the pseudo-Grosseteste) construed the table of vowels upon the particular motions along the speech-organs and points of articulation, lingua, palatum, os, labia. The phonetic scheme a u i e o w e rendered what the pseudo-Grosseteste held to mirror the spectrum of apertures within the oral cavity. Diagrammatically, the types of articulatory motions and acoustic generations resembled geometrical figures and concentric configurations (lines, curves, circles, triangles, and columns).

Roger Bacon (1214-1292) in Linguarum Cognitio closed his mind to Robert Grosseteste's (1175-1253) metaphysics of light, acoustics, or cosmology, and to their obvious echoes in the pseudo-Grosseteste. Bacon propagated the Latin scheme a e i o u and their Continental pronunciation. His essentials of Hebrew transliterated syllabographic b as ba be bi bu. Even his supralinear equivalents for Aleph and Ayin just as his phonographic guide to Hebrew punctuation adhered to Latin alphabetic a e i o u.8

The 14th century yielded no vocalic schemes in sources such as John Mandeville or John Trevisa. In the 15th-century 'De Vigilia Pente-
costes', John Mirk recalled the universal importance of the vowel letters and the Varronian and Donatian subsystem A E I O V.9 In 1499, the anonymous Promptorium Parvulorum provided no entry under vocalsois or vowel. The entry under vocalis in the anonymous Orsus Vocabulorum of 1500 lacks complete schematic exemplification and enumeration.

In the 16th century, the initial phase of the Great Vowel Shift might have stimulated the grammarians' and phoneticians' awareness to reconsider
the hitherto unsuspected conception of harmony in the problematic nature, correlation, coordination, and interdependence of *nomen-figura-portsenas*.

Yet on the whole, insular Renaissance humanists and Tudor scholars widely studied written sources from a graphic and alphabetic angle; they stabilized the Classic Latin vowel subset. Some 23 Tudor authors went on arranging the vowels in alphabetic order. Smith differentiated between still alphabetic semivowel-plus-vowel clusters and nonalphabetic digraphic monophonograms or peak-and-glide diphthongs. This practice, however, failed to convince prompt imitators.

The 17th century brought no fundamental change. Some 35 publications went on propagating the alphabetic schemes *aeiou* or *AEIOU*. Sporadically since about 1550, a minor change started taking firm ground: 17th-century phoneticians used to add the Greek allograph γ for ı. As marks of a major change, pretty regular inclusions of syllabophonic *ba be bi bo bu* (and *ab eb ob ub*) dual schemes of *āēōū* versus *āēōū*, and a supplement *aēoiu* silent* betrays a growing sensitivity to nonalphabetic aspects.

Realizing shades of timbre or duration of syllables, the corpus attracts attention to contextual (allographic, phonetic, syntagmatic, transient) views of the phonic structure. In principle, the sources did not break with the graphic tradition of the pansystemic alphabet.

Prepared to some extent by Robinson's (1617) "Scale of Vowels" *u o e i o* from back to front, by Price's (1665) "Throat Vowels" *u o e i o*, and by Wilkins's (1668) "Sound Chart" and "Organic Alphabet", William Holder's *Elements of Speech* (1669) advanced the phonetic sciences considerably.

Conceding a concurrent share of lips and throat in the generation of vowels, Holder recognized the passage of "Breath Vocalized" through the cavity of the mouth. The shape and mechanism of tongue and oral cavity form the main cause of the number and the main reason for a natural or organic order of the various vowels.

... and then the Series of the Vowels according to their degrees of aperture, and recess towards the Latyra, will be thus: *i e, a, ə, a, o, oˌo*, to which may be added *u* and *y*.

Although Holder's theory did succeed in beating a path to phonetics, his (like Price's and Wilkins's) practice fell back upon the old vice of alphabetic order. The graphic schemes *aeiou* (y) or *AEIOU* (Y) continued to survive in some 24 late-17th-century teachers.

18th-century documents carried on alphabetic schemes and in some 42 arts of poetry, dictionaries, dissertations, elementary essays, grammars, guides, institutes, introductions, repositories, rudiments, spellings, books, and treatises. Again, slightly more than one in four authorities thought fit to specify the morphophonemic sound-values by means of syllabographic *ba be bi bo bu* (by) and *ab eb ob ub*.

Confronted with notational needs in a period of no adequate transcription, 18th-century phonologists resorted to diacritical, numerical, or typological devices. Some augmented the alphabetic order of written *Grabb* accents or figures above polyphonic characters; others implemented an etymological alphabet of historical "representatives" or allographs for phonemic transcription.

All in all, the tentative solutions in marking, listing, and ordering the spectrum of vocalic timbres got phoneticians nowhere.

In 1762, Henry Home (1763 Lord Kaims/Kames) published his three-volume *Elements of Criticism* which, within seven years, went into four editions. Referring to Harris's *Hermes* (1751) and to the then contemporary anatomists, John Rice in 1765 rejected Lord Kaims's suggestion that the five vowels showed the same extension of the windpipe but different openings of the mouth, and that the vowel scheme formed a regular series of sounds descending from high to low in the organic order *i a o u*.

Neither a higher nor lower Note can proceed from the Lips of the Mouth, than first proceeds from the Lips of the Glottis." Rice compared the physical notation of alphabetic *aeiou* with the rise and fall of the syllabophones *bat bit bot but*. He produced evidence that *... they are equally grave or acute*. Sequencing the musical notation in a steady series from high to low

```
<table>
<thead>
<tr>
<th>bat</th>
<th>bit</th>
<th>bip</th>
<th>bot</th>
<th>bot</th>
</tr>
</thead>
</table>
```

the orthoepist concluded from the reverse *bit bet bot but that

"... there must at least be Syllables of five different Lengths: And this is what I mean by the Natural Length of Syllables." Whatever John Rice's "natural length" and "glottal tone" may have meant (duration, fundamental frequency, harmonics, timbre, wave-length rather than pitch), none of the celebrated authorities after him seems to have recognized the equally grave or acute.

Rice's doctrine failed to gain acceptance with some 33 British and American authorities before 1800. Nevertheless, John Rice anticipated Daniel Jones's cardinal-vowel system which by the natural Length of Syllables"


3 BACHER, op. cit., n. 2.


8 M. RICE, loc. cit., 41.

9 RICE, op. cit., 41.


11 RICE, loc. cit., 41.