

TRADITION AND INNOVATION IN PETRUS MONTANUS'

'THE ART OF SPEECH' (1635)

BY

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## PREFACE

It is with the greatest pleasure that I take this opportunity to express my gratitude to my supervisor, Mr. David Abercrombie, Head of the Department of Phonetics in the University of Edinburgh. My thanks are due to him not only for suggesting the subject of this thesis to me, but also for giving me the benefit of his unparalleled knowledge of the history of phonetics.

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If it had not been for the extreme generosity of Professor P.N.U. Harting of the University of Amsterdam, this book would never have been written. It was he who introduced me to the Department of Phonetics in Edinburgh and who arranged for me to be relieved of my duties for considerable periods to enable me to carry out the research necessary for the preparation of this thesis. The kindnesses which he has shown me during the fifteen years in which I have been privileged to be his assistant are too numerous to recount and have placed me under an obligation which I shall never be able to repay.

For material aid I am greatly indebted to the Netherlands Ministry of Education and the Netherlands Organization for Pure Research (Z.W.O.).

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Amsterdam, 13th May, 1962

A.V.

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## ABBREVIATIONS

- Allen, India = W.S. Allen, *Phonetics in Ancient India*, London, 1953.
- Amman, 1692 = *Surdus Loquens*, Amsterdam, 1692.
- Amman, 1700 = *Dissertatio de Loquela*, Amsterdam, 1700.
- Ars Sciendi = *Ars Sciendi sive Logica Opera et Studio T.G., M.A., V.D.M.*, London, 1681.
- Baebler = J.J. Baebler, *Beiträge zu einer Geschichte der lateinischen Grammatik im Mittelalter*, Halle a.S., 1885.
- Benfey = Theodor Benfey, *Geschichte der Sprachwissenschaft und orientalischen Philologie in Deutschland*, etc., München, 1869.
- Van den Berg = B. van den Berg, *Foniek van het Nederlands*, 2nd ed., Den Haag, 1960.
- Blancquaert = E. Blancquaert, *Practische Uitspraakleer van de Nederlandse Taal*, 4th ed., Antwerpen, 1953.
- Blass-Purton = Friedrich Blass, *Pronunciation of Ancient Greek*, translated by W.J. Purton, Cambridge, 1890.
- Bonet = Juan Pablo Bonet, *Reduction de las letras*, etc., Madrid, 1620.
- Brunot = Ferdinand Brunot, *Histoire de la Langue Française*, etc., Tome II, 2nd ed., Paris, 1922.
- Buxtorf = Johannes Buxtorf, *Thesaurus Grammaticus linguae sanctae Hebraeae*, Basel, 1609.
- Caron, 1947 = W.J.H. Caron, *Klank en Tekenen bij Erasmus en onze oudste Grammatici*, Groningen, 1947.
- Chomsky = *David Kimhi's Hebrew Grammar (Mikhlol) systematically presented and critically annotated by William Chomsky*, Philadelphia, 1933.

## ABBREVIATIONS II

- Cohen, Ebeling, Eringa, Fokkema, Van Holk = A. Cohen, C.L. Ebeling, P. Eringa, K. Fokkema, A.G.F. van Holk, *Fonologie van het Nederlands en het Fries*, 's-Gravenhage, 1959.
- Coke = Zachary Coke, *The Art of Logick*, London, 1654.
- Cooper, 1685 = Christopher Cooper, *Grammatica Linguae Anglicanae*, ed. John D. Jones, 1911.
- Cooper, 1687 = Christopher Cooper's *English Teacher* (1687), ed. Bertil Sundby, Lund, 1953.
- Diringer = D. Diringer, *The Story of the Aleph Beth*, London, 1958.
- Dobson = E.J. Dobson, *English Pronunciation 1500-1700*, London, 1957.
- Eijkman, 1937 = L.P.H. Eijkman, *Phonetiek van het Nederlands*, Haarlem, 1937.
- The First Icelandic Grammarian = *The First Grammatical Treatise*, ed. Einar Haugen, *Suppl. to Language*, Vol.26, no. 4, Oct.-Dec. 1950.
- Gräfenhan = A. Gräfenhan, *Geschichte der klassischen Philologie im Altertum*, Bonn, Vol.I, 1843, Vol.II, 1844.
- Hart, 1551,1569, 1570 = John Hart's *Works on English Orthography and Pronunciation* (1551,1569,1570). Part I. By B. Danielsson, Stockholm, 1955.
- Hellingsa, 1938 = *De Opbouw van de Algemeen Beschaafde Uitspraak van het Nederlands*, Amsterdam, 1938.
- De Heuiter = Pontus de Heuiter, *Nederdvtitse Orthographie*, Antwerpen, 1581.
- Van Heule I = Christiaan van Heule, *De Nederduytsche Grammatica ofte Spraec-konst*, ed. W.J.H. Caron, Groningen, 1953.

### ABBREVIATIONS III

- Van Heule II = Christiaan van Heule, *De Nederduytsche Spraec-konst ofte Tael-beschrijvinghe*, ed. W.J.H. Caron, Groningen, 1953.
- Van der Hoeven = A. van der Hoeven, Lambert ten Kate, 's-Gravenhage, 1896.
- Holder, 1669 = William Holder, *Elements of Speech*, London, 1669.
- Jeep = Ludwig Jeep, *Zur Geschichte der Lehre von den Redetheilen bei den lateinischen Grammatikern*, Leipzig, 1893.
- Jellinek = M.H. Jellinek, *Geschichte der neuhochdeutschen Grammatik*, Heidelberg, Vol.I, 1913, Vol.II, 1914.
- Ten Kate = *Verhandeling over de Klankkunde*, 1699, Van der (1699) Hoeven, pp. 56-81.
- Ten Kate = Lambert ten Kate, *Aenleiding Tot de Kennisse van (1723) het Verhevene Deel der Nederduitsche Sprake*, Amsterdam, 1723.
- Keckermann = *Opera Omnia*, Geneva, 1614.
- Keckermann, 1600(?), 1625(?) = B. Keckermann, *Systema Grammaticae Hebraeae, Hanoviae*.
- Kruisinga, 1924 = E. Kruisinga, *A Grammar of Modern Dutch*, London, 1924.
- Kukenheim, 1932 = L. Kukenheim, *Contributions à l'histoire de la grammaire italienne, espagnole et française à l'époque de la Renaissance*, Amsterdam, 1932.
- Kukenheim, 1951 = L. Kukenheim, *Contributions à l'histoire de la grammaire grecque, latine et hébraïque à l'époque de la Renaissance*, Leiden, 1951.
- Lambrecht, 1550 = Joas Lambrecht, *Néderlādsche Spellijnghe*, Gent, 1550. Facsimile, Gent, 1882.

#### ABBREVIATIONS IV

- Lersch = Laurenz Lersch, Die Sprachphilosophie der Alten, Bonn, 1838.
- Livet = Ch.-L. Livet, La grammaire française et les grammairiens au XVIIe siècle, Paris, 1859.
- Madsen, 1586 = Jacobus Matthiae Arhusiensis, De Literis libri duo, Basileae, 1586, herausgegeben und erläutert von Christen Møller und Peter Skautrup. Mit einer dänischen Übersetzung nebst einer Abhandlung über Text und Quellen von Franz Blatt. Acta Jutlandica, Vol.II, No.3; Vol.III, No.1, 1930/31.
- Van der Meer, 1927 = M.J. van der Meer, Historische Grammatik der niederländischen Sprache, Heidelberg, 1927.
- Panconcelli-Calzia, Quellenatlas = G. Panconcelli-Calzia, Quellenatlas zur Geschichte der Phonetik, Hamburg, 1940.
- Panconcelli-Calzia, Geschichtszahlen = G. Panconcelli-Calzia, Geschichtszahlen der Phonetik, Hamburg, 1941.
- Panconcelli-Calzia, Arist. = G. Panconcelli-Calzia, Die Phonetik des Aristoteles, Hamburg, 1942.
- Panconcelli-Calzia, Leonardo = G. Panconcelli-Calzia, Leonardo als Phonetiker, Hamburg, 1943.
- Prantl = K. Prantl, Geschichte der Logik im Abendlande, 2nd ed., 1927.
- Reuchlin, 1506 = De Rudimentis Hebraicis libri tres, Pforzheim, 1506.
- Reuchlin, 1518 = Joh. Reuchlin, De Accentibus, et Orthographia, Lingvae Hebraicae, Hagenau, 1518.
- Robinson, 1617 = Robert Robinson, The Art of Pronuntiation, London, 1617, in The Phonetic Writings of Robert Robinson, edited by E.J. Dobson, London, 1957, pp.1-28.
- Sandys = J.E. Sandys, A History of Classical Scholarship, 3rd ed., Vol.I, Cambridge, 1921.

## ABBREVIATIONS V

- Scheibler = Christophorus Scheibler, *Philosophia compendiosa seu Philosophiae Synopsis*, Gissae, 1623.
- K.E.A. Schmidt, *Beiträge zur Geschichte der Grammatik des Griechischen und Lateinischen*, 1859.
- Schönfeld = M. Schönfeld, *Historische Grammatica van het Nederlands*, 4th ed., Zutphen, 1947.
- Van der Schuere, 1612 = Jacob van der Schuere, *Nederduydsche Spellinge (1612)*, ed. F.L. Zwaan, Groningen, 1957.
- Sexagius, 1576 = Antonius Sexagius, *De Orthographia Linguae Belgicae*, 1576, ed. L. Goemans, Antwerpen, 1899. (Leuvensche Bijdragen III)
- Smith, 1568 = Sir Thomas Smith, *De recta et emendata linguae anglicae scriptione dialogus*, 1568, ed. O. Deibel, Halle, 1913.
- Spiegelhel = Twe-spraack = H.L. Spiegelhel, *Twe-spraack van de Nederduitsche letterkunst*, Leyden, 1584, ed. K. Kooiman, Groningen, 1913.
- Steinthal = H. Steinthal, *Geschichte der Sprachwissenschaft bei den Griechen und Römern mit besonderer Rücksicht auf die Logik*, 2nd ed., Berlin, 1890/91.
- Stevenson and Guthrie = R. Scott Stevenson and Douglas Guthrie, *A History of Oto-Laryngology*, Edinburgh, 1949.
- Sturtevant = Edgar H. Sturtevant, *The Pronunciation of Greek and Latin*, 2nd ed., Philadelphia, 1940.
- Thurot = Charles Thurot, *De la Prononciation Française depuis le commencement du XVIIe siècle, etc.*, Vol. I, 1881, Vol. II, 1883.
- Wallis = John Wallis, *Grammatica Lingvae Anglicanae*, Oxford, 1653 (and later editions).
- Wasers, 1600 = Caspar Wasers, *Archetypus Grammaticae Hebraeae*, Basileae, 1600.

## ABBREVIATIONS VI

Wasers, 1609 = Caspar Wasers, *Elementale Hebraicum*, 2nd ed.,  
Basileae, 1609.

Wilkins, 1668 = John Wilkins, *Essay towards a Real Character  
and a Philosophical Language*, 1668.

Zwaardemaker & Eijkman = H. Zwaardemaker & L.P.H. Eijkman,  
*Leerboek der Phonetiek*, Haarlem, 1928.

## INTRODUCTION

'De Spreeckonst' (The Art of Speech) is a handbook of phonetics, which was published at Delft in 1635. About the life of its author, Pieter Berg, or Berch, (Petrus Montanus), very little is known. He was born at Delft in 1595, and went to Leyden, where he matriculated as a student of divinity in September 1619. After taking his B.D. in 1621, he became minister of Nieuwen Hoorn, a village in the province of South-Holland, where he remained till his death in 1638.<sup>1)</sup>

Of 'The Art of Speech', which was probably the only book Montanus ever published, five copies are known to be extant. The University Libraries of Amsterdam, Leyden, Edinburgh and Hamburg possess one copy each. The Koninklijke Bibliotheek (Royal Library) at The Hague has another.<sup>2)</sup>

Very little notice was taken of the book until 1896, when A. van der Hoeven produced an edition of a number of writings of Lambert ten Kate (1674 - 1731), including an extremely interesting treatise on phonetics, dating from 1699, to which Van der Hoeven added a few extracts from Wallis, Amman and Montanus for comparison.

Before 1896 some thirteen writers had referred to the book, merely showing that they knew of its existence by listing it along with other works on similar subjects, or proving that they had actually seen the book by complaining bitterly about the

divisions and subdivisions with which it abounds (e.g. Pars, 1701).<sup>3)</sup>

By the end of the nineteenth century the erroneous idea that Montanus was the first teacher of the deaf in Holland had become established. As a matter of fact, Montanus does not even mention the teaching of the deaf in his long list of the uses or 'final causes' of phonetics. One wonders whether he had seen, or even heard of, Bonet's 'Reduction' (1620).

The only seventeenth-century reference, which, in addition to being the earliest, is rather more detailed than most of the later ones, occurs in D.G. Morhof's 'Polyhistor Literarius Philosophicus et Practicus', 1688.

In the second edition of 'Polyhistor' (Lubecae, 1714), which I have consulted, the book and its author are noticed in four places. In Tom. I, Lib. II, Cap. III Morhof mentions Wallisius, Holderus, Sibscota, Digbæus, Johannes Paulus Bonnetus (and his predecessor Petrus Pontius, Benedictus Monachus), Helmontius Filius, Hieronymus Fabricius ab Aquapendente, Scaliger, Mallincrotius, 'et Petrus Montanus in singulari libro Belgico, sed erudito, de arte pronuntiandi, quo neminem hactenus accuratiorrem vidi.' (par. 31, p. 342).

Tom. I, Lib. IV, Cap. I De Lingvis et Scriptura, Par. 5, (p.718)  
 'Autores, qui Literas, et earum pronuntiationem, Physice considerarunt, Pet. Montanus, Cordemoy, Joh. Wallisius, Wilh. Holderus, etc. Præcipuus est Petrus Montanus, Delphensis Ecclesiastes, qui Belgicâ linguâ librum scripsit, cui titulus: Bericht van eene nieuwe Konst, genant de Sprakkonst. Delph.1635

in 4. in quo literarum, vocalium et diphthongorum sonos, earumque formationem, satis, ut mihi quidem videtur, accurate examinat. Certè magnâ diligentîâ et curâ naturam literarum et pronuntiationum in omnibus linguis explicuit, ac nemo fuit, qui ipsum hoc quidem in argumento superavit', and, in a discussion of Holder's Elements, 1669, on p. 719: '...quo in libro pluscula notasse mihi videor vel è Montano descripta, vel certè ὁμώηφα.'

In Tom. II, Lib. II, Pars II, Cap. XLVIII, Par. 3 (p. 448) he says:

'Pertinet huc etiam omnis illa doctrina de voce et pronunciatione, de quibus legantur Cordemoxi lib. de verbo, et Petrus Montanus in libro, cui titulus: De nie Spreck-Konst.'

In 1920 C.G.W. de Vooy's devoted two pages to 'The Art of Speech' (Nieuwe Taalgids 14, pp. 46 f; see also p. 114 of his Geschiedenis van de Nederlandse taal, 5th ed., Antwerpen en Groningen, 1952).

Three years later L.P.H. Eijkman in his 'Historical Survey of Phonetics in the Netherlands' (Geschiedkundig overzicht van de klankleer in Nederland, Nieuwe Taalgids, 17, pp. 231 - 243) expressed his great admiration for the book and suggested as the possible cause of its undeserved neglect the 'bewildering, if not forbidding' nature which it derives from its many divisions and subdivisions, from the large number of annoying misprints occurring in it, and from the fact that both in the Appendix and in the Introduction (which was written after the Appendix) the author changes his mind on a number of important

points and invites the reader to make considerable alterations in the text, 'which are impracticable in view of the scarcity of the book.'

Eijkman is convinced that the book requires, but repays, great perseverance on the part of the reader, and that a reprint incorporating all the alterations indicated is needed before the great merits of the author's work can be fully appreciated (Nieuwe Taalgids, 17, pp. 232 f).

In 1924 A. Verschuur published a full-length monograph on 'The Art of Speech' (Een Nederlandsche Uitspraakleer der 17e eeuw. De Spreekonst van Petrus Montanus van Delft (1635), Amsterdam, 1924, 230 pp.). Verschuur, himself a practising phonetician, keenly interested in instrumental work (cf. his De Klankleer van het Noord-Bevelandsch, Amsterdam, 1902), studies Montanus in the light of phonetic theory as current in the late nineteenth and early twentieth centuries. He prints what he considers the most important sections of the book and provides them with a commentary, which, on the whole, is very sound.

The present writer, though he has felt obliged to differ with Verschuur on more than one point of interpretation, wishes to state emphatically that he has found Verschuur a valuable ally in his struggle with Montanus.

Unfortunately, it cannot be said that there has been a great change in the attitude of phonetic and linguistic historians to Montanus since the publication of Verschuur's book.

It is true, thanks to Verschuur's efforts, Montanus is no longer a mere name, at any rate in his own country, but he certainly does not enjoy the reputation which he deserves. A few scholars have made excellent use of the information which Montanus provides, in their attempts to trace the development of Dutch sounds (see esp. W. Gs. Hellinga, *De opbouw van de algemeen beschaaftde uitspraak van het Nederlands*, Amsterdam, 1938; W.J.H. Caron, *Klank en teken bij Erasmus en onze oudste grammatici*, Groningen, 1947, and *De reductievocaal in het verleden*, Groningen, 1952; F. L. Zwaan's ed. of *Nederduydsche Spellinge*, Groningen, 1957).

For the rest Montanus as an original thinker has received scant attention.

J.A. Meijers in an article entitled 'The first Dutch Book on Phonetics' (*Het Eerste Nederlandse Boek over de Fonetiek*, *Paedagogische Studiën*, 21, pp. 419 - 426) stresses the distinction between speech and language which Montanus makes, in which he wrongly sees an anticipation of the Saussurean parole/langue doctrine (see below, Chap.III).

K. Kooiman in his review of Verschuur's book on Montanus (*Museum*, 1925, p. 294) is struck by Montanus' rather frequent references to English at a time when French was the foreign language with which his compatriots were most familiar, and English was comparatively little known. He suggests that Montanus, while a student at Leyden, may have associated with some

of the Pilgrim Fathers, whose stay in Leyden ended in 1620.

If we accept this, it would seem that the Pilgrim Fathers conversed with Montanus in Dutch, witness his knowledge of the English tendency to substitute [g] for [ɣ] in Dutch (Inl.p.11 and elsewhere) and his failure to analyse English ea correctly (M. pp. 98 and 106), unless we assume that Montanus' Pilgrim Fathers came from the North of England.

As far as I know, very little has been written about Montanus in languages with a wider currency than Dutch. Two articles, the one by L.J. Guittart (Petrus Montanus. The great phonetician of Holland's Golden Age, English Studies, IX, Amsterdam, 1927, pp. 1 - 6), the other by Hubert Pernot (Un grand phonéticien hollandais méconnu, Revue de Phonétique, Tome 5, Paris, 1928, pp. 169 - 182), report on the contents of Verschuur's monograph and give an impression of what the work of Montanus is about.

Martin Lehnert, on p. 29 of 'Die Grammatik des englischen Sprachmeisters John Wallis (1616 - 1703), Berlin, 1936, mentions Montanus along with a number of early teachers of the deaf, and tells us on p. 31 that 'auch Montanus rein praktisch-pädagogische Ziele verfolgte' (this is based on Montanus' Dedication to the States ), whereas 'Wallis kommt also der Verdienst zu, als erster an die Erforschung der Erzeugung der Laute ohne Rücksicht auf eine bestimmte Sprache von rein wissenschaftlichen Gesichtspunkten geleitet, gegangen zu sein'.<sup>4)</sup>

In Christen Møller's essay on Jacob Madsen (Acta Jutlandica III, 1, p. 65) there occurs a statement to the effect that Montanus' 'Art of Speech' marks an important advance on Madsen's work, and

that the obscure village parson Pieter Berch, rather than the world-famous anatomist Fabricius ab Aquapendente, was to further the development of descriptive phonetics ('Nicht der weltberühmte Anatom Fabricius, sondern der völlig unbekannte "Bedienaer van Goots Woort in den Nieuwen Hoorn" Pieter Berch sollte die Linie der deskriptiven Phonetik weiter führen').

Unfortunately, in a sense this is not strictly true. Montanus had no influence on the development of phonetics whatsoever, simply because he was not read. I do not think it can be proved that before the end of the nineteenth century the book was studied by anybody who had the remotest idea of what it was about.

Casparus van den Ende has been hailed as a 'pupil of Montanus' (see De Vooy's, *Geschiedenis van de Nederlandse Taal*, 5th ed., p. 114) on the strength of his use of the terms 'front-cleaver' (for 'initial consonant') and 'back-cleaver' (for 'final consonant') in the introductory chapter (on 'letters') of his French dictionary (*Le gazophylace, de la langue françoise et flamende*, Rotterdam, 1654), but there the resemblance ends, and it seems likely that Montanus' and Van den Ende's metaphorical use of the word 'cleaver' has its origin in logical terminology (see the discussion of the word 'ground', below, 1.7).

The reason why so many generations have continued to fight shy of 'The Art of Speech' is not far to seek.

In the first place Montanus' arrangement of his material reminds one strongly of a flora or a railway time-table, and

while these representatives of two useful branches of literature are meant as reference works, 'The Art of Speech' is not. The reader is expected to plod through the book from cover to cover, which is an almost unreasonable order. How a rigorously systematic presentation of a subject can lead to chaos is an interesting problem in itself, an investigation into which, however, lies outside the scope of the present treatise.

In the second place, by writing in Dutch instead of in Latin or in French, Montanus largely cut himself off from a European audience comparable in size to that reached by men like Meigret, Ramus and Madsen before him, and Wallis after him. It is true, Van Leeuwenhoek achieved international fame in spite of the fact that he conducted most of his correspondence with the Royal Society in Dutch, but he had an excellent interpreter in Oldenburg, the Royal Society's Secretary.<sup>5)</sup>

That Montanus wrote in Dutch is no more surprising than that Descartes wrote his 'Discours de la Méthode' in French, and Newton his 'Opticks' in English. Holland was an important country at the time and Dutch was probably more widely known on the Continent than English.<sup>6)</sup>

Moreover, through Simon Stevin, on whose Dutch mathematical terminology (still in use in Holland to-day) Montanus modelled his own phonetic terminology (see M. p. 136), he was influenced by Goropianism, or the belief that the language one happens to be born to is not only the finest, but also the oldest in the

world. (Johannes Goropius Becanus, *Origines Antwerpianae*, 1569, p. 460: Duyts is Douts (the oldest).)

Stevin was even proud of the fact that his terminology was untranslatable (see *The Principal Works of Simon Stevin*, Vol. I, ed. by E.J. Dijksterhuis, Amsterdam, 1955, pp. 90 f).

It is understandable that Montanus found it much easier to devise technical terms in his native language than in Latin. What is regrettable is that he allowed himself to be carried away to a far greater extent than Stevin by the remarkable facilities which his language offered for the making of compounds.

What Gilbert Murray (*Greek Studies*, Oxford, 1946, p. 181) says about the *Grammar of Dionysius Thrax* and the *Syntax of Apollonius Dyscolus* applies, *mutatis mutandis*, to 'The Art of Speech' of Petrus Montanus: 'Both these books strike a modern reader as overcrowded with technical terms, just as do the ancient books on metre. The fault is natural. The Greeks started with no technical terms and felt desperately the need of them. The demand produced the supply, and the unusual facility of Greek for coining words made the supply abundant and perhaps excessive.'

A rough count of Montanus' technical terms yielded 557 neologisms, and this figure does not include the Dutch logical terms, some of which are also of Montanus' own making.

This formidable array of unusual words has a cumulatively stupefying effect on the reader, which has to be felt to be believed. Pernot's remark (*op. cit.*, p. 170): 'La lecture n'en est pas aisée et je ne crois pas qu'une traduction fran-

çaise faite selon les règles habituelles en serait possible,' certainly does not overstate the case. An English translation 'faite selon les règles habituelles' would not be possible either. It would take an Ælfric or a William Barnes to achieve this linguistic tour de force, and the result would be Old English in either case, which would leave large sections of the reading public out in the cold. Of course, a translation into High German of any period would be feasible in principle, but completely beyond the powers of the present writer.

In this account of 'The Art of Speech' an attempt has been made to translate at least the key-terms into English. They have been translated in an unashamedly literal way. In the commentary modern terminology has been used wherever this could be done without running the risk of thereby reading modern theory into Montanus. The hundreds of terms which are not essential to his system have been omitted, since, as was indicated above, they hinder rather than help the reader.

As it is the main purpose of the present treatise to make the gist of Montanus' work available to readers outside the Dutch linguistic community, the accent will be found to be on the passages translated or summarized from Montanus, and not on the commentary. In most cases the resemblances between his and nineteenth-century or even twentieth-century theory are so striking that they need not be pointed out to the specialist.

The commentary consists mainly of a statement of possible sources and parallel places in some of Montanus' predecessors,

contemporaries or near-contemporaries. In some cases a brief survey of the development of the body of knowledge about a particular topic has been added.

Unlike Madsen, whose *De Literis* Book I is a 'mosaic of quotations' (see Peter Skautrup, *Jacob Madsens Dansk, Acta Jutlandica III, 1, p. 102*), Montanus does not consider it necessary to mention any of his predecessors by name, with the exception of Ramus (M. pp. 29, 40, and 89), Petrus Martinus (M. p. 29), Alstedius (M. pp. 29 and 145), Sturmius (M. p. 145), and Keckermannus (M. p. 145), with all of whom he disagrees.

Petrus Ramus is the only writer in this list who could be referred to as a professional phonetician.

Montanus fails to mention his indebtedness to Alstedius, on whose *Encyclopaedia* he seems to have relied for a considerable amount of information of a non-phonetic nature.

By rearranging the material and summarizing some of Montanus' more verbose passages I have tried to reduce to a minimum the anticipations and repetitions which are such an exasperating feature of the original. In contrast to Paṇini's grammar, which in a modern presentation needs to be expanded like shorthand notes, Montanus' book needs condensation. The reader who finds what follows heavy going may take comfort in the thought that the original is worse.

Notes to the Introduction

- 1) Cf. W.M.C. Regt in Nieuw Nederlandsch Biografisch Woordenboek, X, Leiden, 1937; Verschuur, p. 4.
- 2) The Hamburg copy was not known to Verschuur. It is mentioned by Christen Møller, Acta Jutlandica III, 1, p. 65. The two copies referred to in Verschuur's preface as being in the possession of his publishers, were subsequently lost in a fire.
- 3) Cf. Verschuur, pp. 1 ff, Eijkman, 1923, pp. 231 f.
- 4) At last an English phonetician, one ventures to think, whose work was not 'ganz praktisch' (cf. Firth, Papers in Linguistics, 1957, p. 94), but on p. 48 Lehnert admits that Wallis wrote his grammar for foreign learners of English, and even had 'patriotische Motive'.
- 5) Van Leeuwenhoek had some of his letters translated into Latin before despatching them to the Royal Society, see A. Schierbeek, Antoni van Leeuwenhoek I, Lochem, 1950, p. 38).
- 6) As late as 1706 Newton decided to have a Latin translation of the 'Opticks' published, because English was not much read on the Continent (see E.N. da C. Andrade, Sir Isaac Newton, London, 1954, p. 101).

CHAPTER I  
TERMINOLOGY

Montanus' terminological apparatus falls into two parts, a general and a special one, both of which form considerable barriers between him and the modern reader, and, presumably, the seventeenth-century reader as well.

The general part is derived from Aristotelian logic in its early seventeenth-century form, and more especially that section of it, traditionally called Inventio (τοπική), which is primarily concerned with the Praedicabilia, Definitio and Distributio (subjects which are still dealt with in present-day handbooks of traditional formal logic), and the doctrine of the four causes (which began to lose its appeal as the seventeenth century wore on, but continued to be a feature of the later seventeenth-century handbooks).

For the logical terminology in Montanus Verschuur (p. 32) refers the reader to Volkmann's *Rhetorik der Griechen und Römer*, which is of very little use indeed. That a reasonable understanding of the logical framework of 'The Art of Speech' is necessary is shown, for instance, by Verschuur's complete misinterpretation (p. 165) of M. p. 112 (see below, Chapter XII).

The logic of the period is not dealt with in any detail in modern works on the history of the subject, but practically all the information needed is to be found in the following:

- J.H. Alsted, *Encyclopaedia*, Tom.I, Herborn, 1630
- B. Keckermann, *Opera Omnia*, Tom.I, Geneva, 1614
- F. Burgersdijk, *Institutionum Logicarum libri duo*, Leyden, 1626, and many later editions at Leyden, Cambridge, London and Amsterdam.

(I have used the Cambridge edition of 1644).

Montanus certainly knew the first two books (see above, p. 11), and probably the third as well. Burgersdijk became a professor at Leyden in the year that Montanus left.

The logic exemplified by these and similar handbooks, being mainly a reaction against Petrus Ramus' simplifications (which were themselves a completely understandable reaction against medieval scholasticism), was uncomfortably rich in subject-matter, drawing as it did not only on Aristotle's *Organon*, but also on Cicero's *Topics*, Porphyry's *Isagoge*, Boethius' *De Divisione*, *De Differentiis Topicis*, *De Definitione* <sup>1)</sup>, and many later works.

However, one important feature of Ramus' procedure of exposition was retained, namely his predilection for division by dichotomy. It is amusing to compare the notes of warning against excessive dichotomization occurring in the handbooks of the period and the actual practice of the compilers of these handbooks.

Alsted, p. 426: *Distributio constet ex partibus quantum fieri potest, paucissimus. Magnam igitur laudem habent dichotomiæ, si non pariant nimis multas divisiones, quæ inimicæ sunt memoriæ.* Cf. Burgersdijk, *Prefatio ad Lectorem* on Ramus' and Keckermann's *Dichotomy* which 'seems to waste the reader's leisure' (*legentis otio abuti videtur*) and p. 158: *Non tamen semper affectanda est διχοτομία, sive bimembris divisio. Sæpe enim totius dividendi natura dichotomiam respuit.....Modus dividendi adhibendus est, nè subdivisionum numerus nimium crescat. Idem enim vitii habent (inquit Seneca Epist. 89) nimia, quod nulla divisio: Simile enim*

confuso est, quod in pulverem usque sectum est. (Cf. Aristotle's criticism of Plato's view of dichotomy (Phaedr. 265 ff) in An. Prior. I, 31. See also Douglas Bush, *English Literature in the Earlier Seventeenth Century 1600 - 1660*, Oxford, 1945, p. 220, Thomas Fuller's *Worthies*: '.....the bones of a carp, which are as dichotomous as Peter Ramus'.)

It is with Alsted's treatment of logic that Montanus' adaptation of the terminology to his special purpose shows the greatest affinity. However much he may differ with Alsted about letters being indivisible (M. p. 29) and the number of syllables in a comma (M. p. 145), he seems in complete agreement with Alsted p. 29: 'Quid proponit Logica specialis? Modum applicandi notionnes Logicas notionibus aliarum disciplinarum...' and Alsted, p. 425: 'Definitio et distributio sunt duo instrumenta Logica, quae absolvunt circulum cujuslibet artis. Artes enim nihil aliud sunt, quàm perpetuæ et concatenatæ definitiones et distributiones.' (Cf. *Scholia in Dionysium Thracem*, Bekker, *Anecdota Græca* ii, Berlin, 1816, p. 659, 16; Steinthal II, p.165). On p. 12 of his Introduction Montanus mentions as one of the uses of his book the instruction it will afford to those who are interested in logic, because he has devoted as much labour to 'descriptiones, series, partitiones and divisiones' in the presentation of his material as to the discovery of the facts.

The Dutch terms used by Montanus in this branch of special or applied logic are largely identical with those used by Stevin in his 'Dialectike' (1585 and 1621), so far as they go, and for

the rest he seems to have devised his own terminology, which adds to the difficulty of the book. However, in a number of cases he adds the Latin technical terms to his own, and from the collocations in which these occur with the terms not glossed by Montanus, the meaning of the latter can be discovered, once one has acquainted oneself with the system by reading the Latin sources.

### 1.1

His aim is to discover the true nature or essence (οὐσία; essentia, substantia, natura) <sup>2)</sup> of letters <sup>3)</sup> and the other species of speech, i.e. syllables, words and larger units. Essence (οὐσία), which is the first of Aristotle's ten categories or predicaments, is defined by Aristotle himself in a variety of ways for a variety of purposes, and hence the seventeenth-century definitions of this difficult concept also show considerable variation, but agree in being extremely vague. Keckermann, Col. 590, and Burgersdijk, I, Ch.IV, p. 14: 'Substantia est ens per se subsistens.' Ars Sciendi, 1681: 'Essentia rei est totum illud, per quod res est, id quod est.'

### 1.2

The essence of a thing is stated by Definitio (ὄρος, ὁρισμός, λόγος) (cf. Logica horistica, Alsted p. 425). Scheibler, p. 13: 'Definitio perfecta est, quae explicat rem per causas essentielles vel symbola earum, h.e. genus et differentiam substantialem, ut homo est animal rationale (in which animal is the genus to which homo belongs, and rationalis is the substantial or essential or specific difference). Notice that, in spite of what Scheibler

says, this is not a definition of a thing in the sense of individual, but of a species. <sup>The true</sup> Aristotelian definition is that in which the species is the subject of which genus proximum and differentia specifica are predicated, though Aristotle himself often uses *παῖγμα* when he means *εἶδος* (e.g. *Top. I, C.5, 102 A and B*). It was Porphyry (‘*der einflussreichste Verderber der Logik*’, Prantl, I, p. 626) who added species to Aristotle’s four *praedicabilia*<sup>4)</sup> (*κατηγορήματα, κατηγορούμενα*), genus, differentia,<sup>4)</sup> proprium and accidens (*γένος, διαφορά, ἴδιον, συμβεβηκός*) of which genus and differentia together formed the definition (*ὄρος*) of the species, thus arriving at his well-known *quinque voces* (*πέντε φωναί*), making the individual the subject.

Alsted p. 407 even adds *individuum* to the *praedicabilia*, thus bringing their number up to six and leaving no subject that anything can be predicated of (but see Alsted p. 234, where *individuum* (*τὸ ἄτομον*) is said to be the *Fundamentum praedicabilium*).

The essential or internal causes are matter and form (see below, 1.63), of which genus and specific difference are the symbols (cf. the quotation from Scheibler, above, and J. Madsen, p.191: ‘*Vera enim definitio ex partibus rei essentialibus, materia et forma, aut eorum symbolis, genere et differentia, quae rei semper insunt, constare debet.*’)

There is some disagreement among logicians as to the exact relation between matter and form on the one hand, and genus, species and specific difference on the other. Alsted, p. 614: ‘*Genus materiae, differentia specifica formae est symbolum.*’

Ramus, *Dialectica*, ed. George Dounham, London, 1669, p.5  
 (Wotton's translation, London 1626, pp. 27 ff), equates essence, form, and specific difference, but also states that the genus contains the matter and part of the form of the species, while the specific difference adds the rest of the form peculiar to the species.

Note also that εἶδος means both form and species, and that Cicero uses 'forma' in the sense of 'species'. He prefers 'forma' to 'species' for grammatical reasons (Top. VI, 30).

Montanus, who briefly outlines his procedure in Chap. III of his Introduction (Inl. p.14), explains that in his definitions he omits mentioning the genus in cases where it can be supplied from the preceding Divisio.

It should be noted that even where Divisio follows Definitio, it is clear that Definitio presupposes Divisio. Definitio serves as Fundamentum Divisionis, and Divisio leads to new definitions.

### 1.3

Divisio (διαίρεσις) is one kind of Distributio, the other being Partitio (μερισμός)<sup>5</sup>.

In his use of these three terms Montanus clearly follows Alsted p. 426, Cap. XXXI, De distributione: 'Distributio est, quæ distributum in partes resolvit. Ejus doctrina dici potest Logica meristica.

Distributio perfecta est, quâ totum propriè dictum in partes suas resolvitur. Estque divisio, vel partitio. Divisio est distributio generis in species: ut, Animal est homo vel bestia. Partitio est distributio integri in membra: ut, Homo distribuitur in corpus et animam.... Partitio princeps est, quâ totum essenziale resolvitur in materiam et formam: ut, homo in corpus et animam.

Partitio minùs princeps est, quâ totum integrale in partes integrales resolvitur: ut, corpus humanum in artus et ventres, et hi in summum, medium et infimum.'

(Cf. Cicero Top. V, 17)

Montanus' partition is of the 'minùs princeps' type. Montanus (Inl. p.14) points out that his divisions and partitions are into as few species and parts as possible, very often into two, because Dichotomia, if carried out properly, results in the most perfect treatment (tractatio).

A considerable portion of 'The Art of Speech' is taken up by these, largely dichotomous, divisions and partitions, most of which appear again in tabular form (Porphyrian Trees) at the end of each book and of most of the chapters.

Distributions are made first on the basis of properties which the material to be distributed has in itself, and next on the basis of those which it has as the matter of higher units. Thus letters are first arranged in summa genera according to their inherent properties such as place and nature of stricture, and then according to the properties which they have as constituent elements of syllables, words, etc.

It will be seen that this corresponds largely to the distinction between phonetic and phonological treatment of modern times.

After the summa genera have been established (Divisio in genere) according to the various fundamenta divisionis (such as nature of stricture, place of stricture, and what in modern terms would be referred to as the voice/breath opposition), there follows the division of these higher genera into their subaltern genera and

species, ultimately descending to the species infimae (Divisio in specie)<sup>6</sup>). In this latter type of division one summum genus is arbitrarily chosen as the supreme genus, and the other summa genera are arranged under it as subaltern genera or species, each one being looked upon as a species of the one next above it and as a genus of the one next below it.

An illustration in modern terms of this arrangement would be: By adding one out of several possible specific differences to the genus 'plosive' we arrive at the species 'bilabial plosive', which is itself a genus of the species 'voiceless bilabial plosive', in which the specific difference, of course, is voicelessness. One of the species of 'bilabial voiceless plosive' would be 'unaspirated voiceless bilabial plosive', which Montanus would no doubt have subdivided into such phonological subclasses as 'syllable-initial' or 'syllable-final' or 'second or third member of a syllable-initial or syllable-final cluster'. (Notice that he would not have placed the genus 'consonant' above that of 'plosive' or anywhere else in his predicamental line). In actual fact, Montanus' divisions are a good deal more complicated than the one outlined above, as may readily be seen from any of his Porphyrian Trees. And, of course, his starting-point (supreme genus) might just as well have been 'bilabial', or 'voiceless' or 'unaspirated'.

A simple example of partition, i.e. distribution of a whole into its parts, is provided by Montanus, when he splits up a letter into 'halves', i.e. a 'ground' and the gliding elements or 'cleavers' as he calls them, or into 'third parts', i.e. a

ground, an on-glide (front-cleaver), and an off-glide (back-cleaver) (Bk. II, Ch.I, p. 28).

Similarly one type of syllable consists of two halves: a syllabic element ('ground') and non-syllabic elements ('cleavers'), or three third parts: a 'ground', a 'front-cleaver' and a 'back-cleaver' (Bk.III, Ch.II, pp. 113 f).

#### 1.4

Distribution may be followed by a statement of properties which do not form the basis of divisions, i.e. those which do not constitute a specific difference. It should be noted that, like many logicians, Montanus uses the term 'property' in a wide sense. A 'property' may be the principal characteristic which distinguishes a species from its proximate genus and its cognate or co-ordinate species, i.e. the specific or essential difference, or it may be a non-essential attribute or accident (the last of the predicables), which a thing may either possess or not possess, and yet continue to be what it is (cf. M. Bk.I, Ch. V, p. 16). Thus Montanus holds, as against Ramus and his followers, that lip-rounding in [o],[u] and [y] is not a specific difference, but an accident (Bk.II, Ch.V, p.40), because it is possible to produce these vowels, 'though with some imperfection', without lip-rounding.

It seems that Montanus only once uses the word 'property' in its most obvious sense, viz. that of 'proprium' (ἴδιον), i.e. a quality which is not part of the essence, but derivable from it, and hence sometimes referred to as essential, though not specific (Ar. Top. Bk.I, Ch. 5). This one instance, if it is one,

occurs on p. 161, where he says that in what we would now call the voiceless plosives and fricatives there is 'narrowness' of articulation, which has 'stiffness, firmness or tenseness' for its inseparable concomitant properties, just as the 'broadness' of articulation in the corresponding voiced consonants is accompanied by 'laxness, looseness, and spaciousness'. It might, however, be argued that 'inseparable property' is here used in the sense of the 'inseparable accident' of many contemporary, as well as earlier and later, logicians (cf. Thomas Wilson, *The Rule of reason*, London, 1584, 6 v., where moisture in water, and heat in fire are given as examples of inseparable accidents. Keckermann, Col. 638, Burgersdijk, p. 51, and Coke, 1654, p. 68, all give 'blackness in a raven' as an example of 'inseparable accident').

### 1.5

The statement of the properties is usually followed by Explanations and Examples, to which are often added Demonstration of the Truth of Montanus' opinions (*Demonstratio, Argumentatio, Probatio, ἀπόδειξις*) and Refutation of the Erroneous Ideas of his predecessors (*Refutatio, ἔλεγχος*).

### 1.6 Cause (*causa, τὸ αἴτιον, ἡ αἰτία*)

With his contemporaries Montanus shared the Aristotelian belief that a thing cannot be known perfectly, if one does not know its causes (Aristotle, *Metaph.* 994 B 30; Cicero, *Top.* XVIII, 67; cf. Madsen, p. 5; Coke, 1654, p. 50: 'As without a cause nothing is done, so also without it nothing is distinctly known'.)

Like Ramus, and many others, he quotes (Inl. p. 9) Vergil's 'Felix qui potuit rerum cognoscere causas' (Georg. II, 490)<sup>7</sup>). Aristotle's four causes are dichotomized into external and internal, and these in turn into the efficient cause (τὸ αἴτιον ποιητικόν), and the final cause (τὸ αἴτιον τελικόν, τὸ τέλος), and the material cause or matter (ἡ ὕλη, τὸ στοιχεῖον, ἡ δύναμις), and the formal cause or form (τὸ εἶδος, ἡ μορφή), respectively.

Alsted, p. 411: Causa est, quæ essentiam dat causato.

Alsted, p. 612: In specie causa est externa, vel interna. Illa dicitur causa γενέσεως, hæc οὐσίας.

Causa externa est, quæ extra causati essentiam manet. Estque efficiens, vel finis. Efficiens est causa, à quâ res est.

Alsted, p. 613: Finis est causa, cujus gratiâ res est.

Alsted, p. 614: Causa interna est, quæ essentiam causati constituit: ideoque sic importat influxum ad esse causati, ut sit pars essentiæ. Estque materia, vel forma. Materia est, ex quâ res est. Forma est causa, per quam res est.

Cf. Wallis, Inst. Log., 3rd ed., 1702, p. 10: Efficiens, à qua; Materia, ex qua; Forma per quam; et Finis, propter quam, res fit.

Kort Begrip, 1585, p. 8:

The efficient cause of bread is the baker, its matter is the flour, its form is the shape of the loaf, and its final cause is to be eaten.

(The efficient imposes the form on the matter to achieve a certain end.)

1.61

Montanus' final cause or End has rather more species than the

other causes, and as it is the first cause that we meet with in 'The Art of Speech', we may as well deal with it first.

Here are some illustrations of the Ends that occur in Montanus:

Bk. I, p.6:

The Ends of speech, which at the same time are Ends of the art of speech, are

I. to signify all kinds of things.

This is the principal and most general end, for anyone who speaks (or: speaks well ? Dutch: 'die wel spreect') without having this intention, is considered mad.

II. subordinate, and usually concomitant, ends of speech:

a) to be itself signified, i.e. to be written down by the speaker himself or by another person at his dictation.

b) to relieve man's feelings, e.g., when a person speaks to himself in fear, pain or joy. For this is done not only to signify a particular feeling or emotion, but partly or wholly to relieve it by such speech or exclamation.

Montanus adds that the gratification of the sense of hearing also belongs here, though it is more closely associated with poetry and singing than with ordinary or 'loose' speech.

(Cf. Alsted, pp. 266, 486, 509: 'oratio soluta' as opposed to 'oratio ligata', which is poetry.)

c) to teach others to speak, e.g. by making children who cannot yet speak well repeat things after one, or by teaching adults how to pronounce a foreign language.

(Cf. Alsted, p. 413:

Finis principalis est, cujus gratiâ res est primariò. Dicitur eleganter architectonicus. Estque summus, vel subordinatus.

Summus est, ad quem reliqui fines ordinantur.....

Finis minùs principalis est, qui refertur ad summum.

p. 411: Causa est principalis, vel minùs principalis. Illa primariò agit, hæc secundariò. Et illa hanc non tollit aut excludit, sed extollit et includit.

A good illustration is provided by Burgersdijk, p. 76: Finis principalis vestium est, ut corpus nostrum tueantur contra cæli inclementiam; finis secundarius, qui cum principali illo fine conjunctus est, ut corpus ornet.)

On p. 6 (the page immediately preceding the Introduction) Montanus tells us how he has taught an illiterate adult to spell and read with the help of his new spelling system. This is an 'usus sive finis minus principalis' of his art of speech.

(Cf. Keckermann, p. 629).

On pp. 3 f of Bk. I he lists the Ends of the art of speech. The Finis Summus is the Glory of God.

Subordinate ends are a) the proximate end, b) some remote ends. a) the proximate, proper, internal, and whole end is to teach the way to speak.

This is the end of the whole art of speech and of all its parts. It is the proper end of this Art, which it does not share with any other Art, and, therefore, everything that has this end belongs to the art of speech, and anything that has not this end should be assigned to another Art or Science, for just as Sciences are distinguished from each other by their grounds (see

below, 1.64), Arts are distinguished by their ends.

b) The remote ends are:

1) to teach the way to make matter in order to signify all kinds of things by it.

This end is external, and therefore, not always concomitant, for one may learn to pronounce sounds without having the intention to signify anything by them. This end is also a common end, for one may learn to make other matter to signify something by it, such as ringing or tolling a bell, beating a drum, writing script, etc.

(Cf. Holder, 1669, p. 4, on communication by means of bells (changes) or torches (number and position), drum and trumpet.)

At the same time this end is remote, because it is an end of the first end (i.e. the proximate end).

This and the preceding end may be a matter of complete indifference to a person as far as his mother tongue is concerned, because he may imagine that he can speak and analyse it well, and not be anxious to understand his own language, but these ends may make him alive to the fact that without the help of this art, it will be far more difficult for him to learn to pronounce a foreign language.

2) to teach the grounds and elements of signifying all speech by visible marks and of reading speech thus signified.

This end is of great importance and cannot be attained unless the way to speak has been mastered. This is another common end, since the art of writing has the same aim.

(Cf. Alsted, p.413: (Finis summus est) vel simpliciter summus, ut est solus Deus: vel secundum quid, ut sunt fines artium.

Alsted, p. 411: Causa est remota, vel proxima.

Illa est mediata: hæc immediata. Et hæc sola parit scientiam, sive satisfacit quæstioni propter quid.

p. 411: ...causa est per se, vel per accidens. Illa producit rem internâ facultate: hæc, externâ. (Cf. Alsted, p. 62 on finis proprius.)

p. 613: (Finis) internus (est), qui intra rem cujus est: ut, domus est finis architectonicæ; (Finis) externus (est), qui est extra rem: ut, architectonicæ finis est habitatio domus.

(Cf. Alsted, p. 62.)

p. 73: Finis per se est, qui disciplinis est quasi internus, seu, ad quem disciplinæ essentialiter referuntur.

p. 613: (Finis) adæquatus sive totalis (est), qui reciprocatur cum finito, ut bene disserere est finis Logicæ.

p. 406: Finis Logicæ adæquatus et internus est tradere modum bene disserendi. Est adæquatus; quia reciprocus. Est internus; quia in potestate Logici est, hunc modum tradere.

p. 63: Disciplinæ distinguuntur subjectis et finibus, et inde sumunt suam unitatem.

p. 73: Finis generalis est, quem disciplinæ cum aliis rebus habent communem. Finis specialis est, qui reciprocatur cum disciplinis... )

1.62

The seven chapters devoted to the Efficient Causes of speech (Bk. I, Chap. III - IX) deal mainly with the organs of speech (cf. Madsen, pp. 9 ff; Fabricius ab Aquapendente, de Larynge, p. 32; Keckermann, Col. 1222; Robinson, p. 10).

The highest efficient cause is God, the lowest and proximate cause is man, who has within him everything by means of which

speech can be made, i.e. the Principal Worker (the Soul) and the Tools or Instruments (Bk. I, p. 7). (Cf. Robinson, p. 10: 'The spirituall (efficient) cause is the minde' and 'The instrumentall causes' are the organs of speech.)

Montanus compares the breathing system to a pair of bellows, of which the Principal Worker is a force which moves and guides the Instruments (i.e. the handles and ropes of the bellows).

(Cf. Alsted, p. 412: (Causa Efficiens) est solitaria, vel socia. Illa rem producit absque aliâ causâ, et dicitur totalis: hæc producit effectum unâ cum aliâ causa, et dicitur partialis, estque principalis, vel minùs principalis (= adjuvans, ministra, p. 236; cf. Madsen, p. 11).

Principalis effectum producit primariò: minus principalis, secundariò. Et hæc est impellens, impulsiva, vel instrumentalis (αἴτιον ὀργανικόν, ὄργανον, p. 236), Causa impellens est intra vel extra efficientem. Instrumentum similiter est conjunctum principali agenti, vel ab eo sejunctum... Solus Deus est causa simpliciter solitaria.

Keckermann, Col. 185: Instrumentalis causa est, quæ Principali in efficiendo subseruit. 'Melanchthon: Instrumentales sunt organa extra naturam principalis causæ, quæ applicata et mota ab aliis, adiuuant actionem, vt telum, securis'....

Victorinus Strigelius: Instrumentales sunt organa, per quæ est efficax causa principalis. Idem ergo significant causa Instrumentalis, instrumentum, ὄργανον, et causa administra.)

1.63

As might be expected, the two internal causes, matter and form,

play an extremely important part in the formulation of Montanus' statements about speech. Some illustrations of his use of the words 'matter' and 'form' may be helpful.

Letters are the matter of which syllables, words, word groups and sentences consist. Letters are the proximate matter of syllables, syllables of words, etc. (*passim*). (Aristotle, *Metaph.* IV, 3; VI, 17, and Apollonius Dyscolus, *Περὶ Συντάξεως*, see Steintal, I, 254, II, 237.)

Height of sound (i.e. sonority) is a property which letters have as the matter of syllables (M. p. 86).

The matter of  $\Theta, \chi, \phi$  (i.e. breath) comes from the throat, but their essence is not there (M. p. 52).

A more special use of the terms 'matter' and 'form' is illustrated by the following passages:

The tools (*Causa Efficiens Instrumentalis*) are the breathing apparatus and the forming apparatus (Bk. I, p. 8). The soul (*Causa Efficiens Principalis*) induces the forming apparatus, which consists of forming vessels or forms, whose matter (forming-matter) is made up of such organs as the throat (taken in a very wide sense), the tongue, the lips, the lower jaw, and the nose, to produce with the help of the forming-muscles (i.e. the muscles of the above-mentioned organs) the forms (configurations) necessary for speech (Bk. I, pp. 8 f).

The breathing apparatus and the forming apparatus perform the two actions which produce speech, viz. breathing and forming. These actions are analogous to the ones involved in playing the organ or the flute (blowing and forming) or the zither or lute (strumming and making the tones) (Bk. I, 7).

(Cf. Holder, p. 22 on the 'Material and Formal parts of letters', p. 64: the matter is breath or voice ('prepared by the Lungs, Larynx, Mouth, Nose', p. 96), while 'the form is constituted by the motions and figures of the organs of speech' ('Forme is Articulation by Appulse or Inclination without appulse', p. 96), and p. 97 on the four sorts of matter: breath-oral, breath ore-nasal, voice-oral, and voice-ore-nasal).

Bk. I, p. 25:

The air or breath contained in the forms (i.e. forming-vessels) is the first matter of speech, as it receives the form of speech first. The air outside the forms is the second matter of speech, as it receives the form of speech from the first matter.

(Cf. Keckermann, Col. 622: (Materia) prima est, quæ tantum materia est, et nullo respectu compositum: vnde et materia absoluta et simplex dicitur. Materia secunda est, quæ sic est materia, vt simul etiam sit compositum materiale vnde et materia secundum quid dicitur.)

The two actions producing speech, i.e. breathing and forming, result in an internal and an external form of speech. The internal form is the transient force which breathing produces in, or imposes on, the matter (cf. Bk. I, pp. 14 f, where the transient form or internal or audible form of the voice is said to be a voluntary force and the essence of the voice.)

The external form is provided by the shape which the organs of speech assume, i.e. the various configurations of the vocal tract. It is produced by the action of forming.

Montanus compares these two forms of speech to a gun-shot<sup>8)</sup>, which has for its internal form the permeating force imparted to the cannon-ball by the detonation of the powder, and for its external form the trajectory which it receives from the barrel. The difference between a shot and the action of speaking is that the permeating force in the former moves in space with its matter (i.e. the cannon-ball), while the matter of the transient force in the latter has little if any local motion, and <sup>the form</sup> is transferred rapidly from the first to the second matter and spreads in a remarkable way.

Cf. Alsted, p. 413 on *Forma interna, vel externa*, and p. 624: *Figura sive forma externa, quæ est certa coloris et lineamentorum in corpore configuratio.*

Scheibler, p. 42: *Figura est qualitas, qua significatur certa lineamentorum in corpore configuratio.*

Montanus' transient force is probably the 'actio' (ἐνέργεια) or 'operatio' or 'motus' (Keckermann, Col. 1390) or 'effectio' (Ars Sciendi, p. 81), 'transiens' or 'externa' (Keckermann, Col. 881) by means of which a 'Causa Efficiens Transmutativa' or 'Transiens' brings about its 'effectum' or 'opus' (ἔργον). (Efficiens) Transiens 'quæ producit actionem transeuntem' (Alsted, p. 612), 'quæ producit effectum extra se', in contradistinction to an immanent efficient cause, 'quæ producit effectum in re ipsa' (Burgersdijk, p. 66), and cf. Keckermann, p. 614: *Efficiens Transmutativa est, quæ cum notabili transmutatione seu motu agit. Arist. lib. 3 Phys. cap. 3 t 22 docet omnem actionem transeuntem esse cum motu coniunctam.*

(On 'actio transiens' see, besides Burgersdijk and Keckermann, Du Moulin, p. 31; Scheibler, p. 42; Alsted, p. 236; Coke. pp. 38 ff and 59; Ars Sciendi, p. 81.)

Echoes of phrases from some of the handbooks are discernible in Montanus' actual wording.

(On 'motus localis' (or spatial movement, *φορά*) as the most important among the species of 'actio transiens', see Keckermann, 1392; Burgersdijk, p. 33; Ars Sciendi, p. 81. The varieties of motion listed there all go back to Aristotle's Physics (cf. A.E. Taylor, Aristotle, p. 56).)

The following passages illustrate Montanus' use of the term '(external) form': A 'single' letter consists of three parts: 1. a ground, 2. a front-cleaver (on-glide), 3. a back-cleaver (off-glide). (See above, 1.3, partition)

A letter-ground is the principal part of a letter, with which its form is inseparably connected, or in which its form is contained. Hence a letter cannot exist without its ground. The letter-ground is formed with the form of the letter, in so far as it (i.e. the form) is permanent.

The cleavers are caused by a change in the forms or by the forms in changing, while expiration continues (Bk. II, p.28).

On p. 92 Montanus distinguishes two types of junction of letters, viz. glideless junction, where there is direct contact between the grounds of the two letters, caused by breathing through permanent forms, and gliding junction, where 'some sound' can be heard between the two grounds, which is caused by breathing through changing forms.

Further illustration of Montanus' conception of the interplay

between matter and form is provided on p. 152, where he discusses the matter, the form, and the parts of the 'species of speech' which corresponds roughly to the *κῶλον* of the classical authors, and which he calls 'sentence member'. It appears that the form is what had better be called 'accent' at this stage (i.e. a complex of stress and pitch movement), the matter consists of letters, syllables, words, and stress-groups (the farthest, farthest but one, next but one and next, matter, respectively) and the parts, likewise, are the letters, syllables, words, and stress-groups. He adds: 'All these are also matter of sentence members, when they are considered without respect to the whole, or rather, when they are not considered as containing part of the form of the whole sentence member. But they are parts of sentence members, when each of them is considered to contain part of the proximate form of a whole sentence member.' This means, in effect, that an aggregation of matter does not yield a whole. Only after the form (in this case: the prosodic features) has been added, is the whole constituted.

This doctrine is reminiscent of the well-known place in Aristotle's *Metaphysics* VI, 17, where we learn that a syllable is not just the sum of the letters of which it consists. (Cf. Alsted, p. 614: *Nihil enim resolvi potest in formam et materiam, sed in materiam tantum*; Burgersdijk, p. 52; Panconcelli-Calzia, *Die Phonetik des Aristoteles*, p. 18; for a modern statement of a related idea, see Robins, *Ancient and Medieval Grammatical Theory in Europe*, p. 13, fn. 2)

In the chapter on Spelling and Notation (Inl. p. 25) Montanus distinguishes between matter-marks and form-marks, the former being letters of the Roman alphabet indicating speech sounds, the latter diacritics indicating 'accent' and junction, i.e., the form and properties which the matter receives.

In an utterance the suppression or addition or shifting of a strong stress is a change in form, though the matter remains constant (p. 147).<sup>9)</sup>

Another interesting point is made on p. 135, where Montanus tells us that compound words are double in matter, but simple in form, because they contain only one strongly stressed syllable. As a thing should derive its name from its form, he calls compounds simple words, (cf. Coke, p. 59, 'Every thing is named not of the matter, but of the form...'). When a trisyllabic word is pronounced as a disyllable or vice versa (synæresis and diæresis), there is a change in form, but not in matter (M. 118).

#### 1.7

The term 'ground' which Montanus sometimes uses synonymously with 'matter' deserves special notice, as it constitutes another stumbling-block to the modern reader.

It is one of his favourite words and it occurs in a variety of meanings, apart from the obvious ones, such as 'foundation or basis', 'elements, rudiments', 'floor of the mouth' and the technical uses that we have already come across, such as 'ground of a letter or syllable'.

In a number of places the terms 'ground' and 'matter' are bracketed together, e.g. Inl. p. 11: 'Pronunciation is the ground and matter of languages', where 'and' probably means 'or', as it often does in the seventeenth century, and where the meaning is 'matter' in the sense of 'material cause, *materia ex qua*'.

On p. 149 he talks about stress-groups being the 'ground (subjectum) or matter' of the degrees of 'height of sound' (i.e. accent, on which see above, 1.63) occurring in the stress-groups. This may be another instance of the matter/form relation discussed above, but the presence of the word 'subjectum' makes it more likely that he was thinking of the subject/attribute (or accident, or adjunct) relation familiar to logicians, the attributes being, of course, the degrees of 'height of sound'. His 'Subjectum' would then mean 'Subjectum recipiens in hæsiōnis...., quod recipit in se: aliâs subjectum in quo, et subjectum inhærentiæ, item materia in quâ' (Alsted, p. 617; cf. O.E.D., s.v. Subject sb. 6: The substance in which accidents or attributes inhere. Subject of inhesion or  $\dagger$ inherence. (Aristotle's  $\acute{\upsilon}\rho\omicron\kappa\sigma\acute{\iota}\mu\epsilon\nu\omicron\nu$ )).

On p. 25 of Bk.I he mentions 'the matter of speech, or the ground to which it cleaves, and which receives the form', using the very words in which Stevin defines the subject/adjunct relation in his *Dialectike*, p. 19 (cf. Coke p. 65: A subject is that whereunto an Accident sticks, p. 27: Accident is that which cleaveth to a substance...., cf. p. 71: the part cleaves to the whole).

Montanus **thus** looks upon speech as an accident or adjunct of the breath in the forms and the air outside them, breath and air being the matter of speech (see above, 1.63). It might be argued from his use of the word 'cleaver', which is related to the one used by Stevin for 'adjunctum' (cf. *The Principal Works*, Vol. I, p. 84, where a compound word is analysed into an adjunctum and a subjectum (cleaver and ground)), to indicate a glide preceding or following the 'ground' of a letter, or a letter preceding or following the 'ground' (i.e. the syllabic sound) of a syllable, that he is dealing with them in terms of the subject/adjunct relation, too. The subject would then be the 'subjectum (recipiens) adhæsionis..., quod recipit ad se (Alsted, p. 617) as distinct from the 'subjectum inhæsionis, quod recipit in se', dealt with above.

The only other place where he glosses the word 'ground' by 'subjectum' is to be found in the Table on p. 32 of the Introduction.

The description of the art of speech itself deals among other things with 'the ground of <sup>the</sup> treatment (subjectum tractationis), the ground of the teaching (subjectum informationis), and the ground of the action (subjectum operationis)'. These terms are explained on pp. 2 f of Bk.I, where we read that the ground with which this art is concerned is of three kinds: 1. the ground which is treated, 2. the ground which is taught, 3. the ground which is made.

The ground which is treated is the way to speak and is contained in the description and the discussion of the nature, causes, and properties of speech.

The ground which this art teaches is man's power to learn to speak (lit. power to be able to learn to speak).

It is part of the business of this art to turn this natural power into the acquired power (*habitus*) of actual speech.

It is true that many animals can be taught to speak a little, but, as their powers are limited, and as they can only learn by imitation, having no intelligence, they are incapable of being taught by art. Therefore, they cannot be considered to be a ground of the teaching of this art. Nor can images which could be made to speak a little. (It is said that it took Albertus Magnus thirty years to make an image which spoke a number of different words, and which was smashed to pieces by Thomas Aquinas.)<sup>10)</sup> It should be added, however, that this art lays the proper foundations for, and would be very helpful in, the construction of such images.

'On second thoughts I am prepared to admit animals and images as accidental grounds' (M. Bk.I, p.3).

The ground which is to be made, and which is made, is all kinds of pronounceable sounds.

Montanus' definition of 'Art' is a body of knowledge 'which teaches a way to work or make something' (Bk.I, p.1).

(Cf. Alsted, p. 63: *Disciplinæ practicæ et poeticæ tradunt præcepta agendi aliquid aut faciendi*).

The Art of Speech teaches the way to make audible matter (Bk.I, p.1). A remote end of this art is to teach to make matter in order to signify all kinds of things by it (Bk.I, p.4, see above 1.61).

If one thing is clear about all this, it is that 'ground' here means 'subject-matter, i.e. *objectum* or *materia circa quam*', cf. O.E.D. s.v. Subject-matter, *subjecta materia* (Boethius), which represents Gr. ἡ ὑποκειμένη ὕλη (Aristotle)sense 6b. Cf. Gilbert Murray, *The Beginnings of Grammar*, in *Greek Studies*, Oxf., 1946, p. 182.

As far as I can see, Alstedius is the only other writer to use these three terms, and it seems likely that Montanus borrowed them from him, redefining two of them.

Alsted p. 63 (*Technologia*, a general discussion of Arts and Sciences).....*Subjectum est informationis, tractationis, vel operationis. Subjectum informationis est intellectus, voluntas, affectus, memoria, vel oratio. Subjectum tractationis, sive doctrinae, est ens quod explicatur vel in genere, vel in specie. Subjectum operationis, sive usus, est itidem ens, cui applicantur praecepta.*

Cf. p. 406: *Subjectum Logicæ est informationis, tractationis, et usus. Subjectum informationis est ingenium Logicum: et quidem primum est ratio, secundarium verò est partim memoria, partim oratio. Subjectum tractationis est modus bene disserendi. Dicitur aliàs subjectum artis, itemque doctrinae, et internum. Subjectum usus est ens et non ens: quod aliàs dicitur subjectum artificis et externum.*

p. 618: *Subjectum occupans est, circa quod aliquid versatur: aliàs objectum et materia circa quam.*

*Estque 1. Per se, vel per accidens: (ut objectum intellectus per se est verum, per accidens falsum). 2. Internum, quod est intra rem, (ut numerus est subjectum Arithmeticae:) vel externum,*

quod est extra rem, (ut res numerabilis est subjectum Arithmeticae). Illud est subjectum vel informationis, vel tractationis: istud operationis sive usus.

Keckermann, Col. 633 only mentions 'subjectum informationis' and defines it as 'cui absolute et proprie accidens tribuitur.'

He points out (Col. 623) that subjectum and objectum are improperly called 'matter' and quotes Melanchthon's warning against these uses of the word 'matter'. His explanation of objectum per se and per accidens (Col. 643 f), though different from Alsted's, is not much more helpful: Per se est, ad quod res per se et sua natura ordinatur. Objectum per accidens est, circa quod res per accidens versatur.<sup>11)</sup> (Cf. Montanus' accidental grounds referred to above).

Wallis, Inst. Log., p. 74, only mentions Subjectum Tractationis seu occupationis (= objectum or materia circa quam) and gives the following example: Sic Iliados Homeri, Subjectum, sive Objectum, est Trojanum Bellum: Et, Odysseidos, Peregrinationes Ulyssis.

Another instance of 'ground' in the sense of 'subject-matter' occurs in Montanus Bk.I, p.4 '...Sciences are distinguished from each other by their grounds, Arts by their ends' (see above, 1.61). Cf. Schol. in D.T., Bekker, Anecdota Graeca, ii, Berlin, 1816, p. 658: (The arts of) logic, rhetoric, and grammar deal with the same subject-matter (i.e. sentences), but they have different ends. (Cf. Steinthal, II, p. 181; Robins, D.T., T.P.S., 1957, pp. 77 f)

Alsted, p. 63: ...unitas disciplinae theoreticae sumitur ex unitate subjecti tractationis...Disciplinae practicae et poeticae tradunt praecipua agendi aliquid aut faciendi.

## 1.8

The last instance of 'ground' in Montanus' book brings us to two other interesting words, viz. 'deed' and 'work'. In the last paragraph of Book VI, p. 157, he tells us that before publishing the special part of this 'Art of Speech', which will expound its use (i.e. its practical application) and hence show most clearly its usefulness, he would like to know what the reader thinks of the theory (he adds the gloss 'Theoria' to the Dutch word 'Spiegeling'), which is the ground of the deed (M. Daet), before he (i.e. the reader) is burdened with the work (M. VVerc).

(Cf. Alsted, p. 65: *Disciplina docens...tradit præcepta, Disciplina utens...usum præceptorum ostendit. Disciplina una et eadem est generalis, et specialis.*

...omnis disciplina constat theoriâ, id est, cognatione præceptorum, et praxi, hoc est, usu præceptorum. Itaque hoc sensu omnis disciplina est theoretica, et practica. Et hinc quoque omnis disciplina est docens et utens.)

Montanus here uses the words 'Spiegeling' and 'Daet' for 'theory' and 'practice', as Stevin had done before him (see *The Principal Works of Simon Stevin, Vol. I, p. 21*). In most contexts, however, Stevin's 'deed' and 'work' are renderings of Latin 'Effectum' (see his *Dialectike, p. 9, Het werck ofte de Daet (Effectum)*, and *The Principal Works, p. 56, daden (Effecta)*, pp. 64 and 90, daet (Effectum).)

'Effectum' was used by the logicians for that which is brought about by any or all of the four causes (Ramus, ed. Dounham, 1669, p.7: *Effectum est, quod è causis existit*. He adds that both the action producing the effect and the effect itself are called

'effectum': hic motus et res motu facta effectum dicitur).

Many writers point out that the proper translation of αἰτιατόν is 'Causatum', and that 'Effectum' should be reserved for that which is caused by the Causa Efficiens (cf. Keckermann, Col. 630). The other causata likewise derived their names from their causes. Alsted, p. 414: Effectum est, quod pendet ab efficiente. Estque actio, vel opus (cf. ἐνέργεια and ἔργον, and note that this agrees with Ramus' remark quoted above, except that Ramus' 'Effectum' is any Causatum. Of course, the effect may itself be an action.). Finitum est, quod pendet à fine. Dicitur etiam destinatum et medium...Materiatum est, quod ex materiâ est. Formatum est, quod per formam est.

Burgersdijk, p. 57: Causatum materiæ et formæ, dicitur compositum; efficientis, effectum; finis, medium, sive destinatum. Atque hæc non reipsa, sed ratione discrepant.

The following passage from Montanus (Inl., p. 8) clearly illustrates his use of 'deed' in the sense of Effectum = Opus: The invention of the art of speech did not take place all at once, but bit by bit. I thought of one thing, then of another, and at every stage I raised a number of objections to my own theory. I then chose the most likely solution and went on calling that in question till I felt I had hit on the truth.<sup>12)</sup> Discovering the true nature of the old letters (i.e. those which were known to his predecessors, but inadequately described by them, A.V.) gave me the greatest trouble, because our knowledge of them was confused and imperfect and it was very difficult to shake off the old deep-rooted notions about them and adopt new ones instead.

I here had to proceed from the known deeds to the unknown causes, and from the causes of the old letters to those of the new ones (i.e. those which were part of the (Dutch) language, but of whose existence all Montanus' predecessors had been ignorant), and from them to new deeds or letters themselves.<sup>13)</sup> I did not discover all the new letters from their causes. Of some I accidentally perceived the deed and I then had to work back from the deed to the causes.

On p. 21 of Book I he defends his terms 'sounding and rustling letters' (for voiced and voiceless sounds, respectively), which are taken from their work or deed, on the ground that 'the deeds which they produce are more easily appreciated than their causes' (cf. his remark on p. 135 that a thing should derive its name from its form).

Here 'deed' means 'actio' rather than 'opus'. In saying 'the deeds which they produce' instead of 'the deeds which produce them', he carelessly attributes these actions to the letters, instead of to their causes, as his system would require. This type of action is not an effect, but a 'motus' producing an effect (see above, 1.63). His usual word for 'actio or operatio' is 'werking' (e.g. Inl., p. 32, Bk.I, pp. 3, 7, 17 and 25, Bk.II, pp. 37, 39), but note that in the Dutch poem preceding the Introduction (p. 6, 1.8), breathing as an action of speech is referred to as 'work'.

#### 1.9

As regards the special (phonetic) terminology, he observes that he has had to invent it himself, simply because no adequate

descriptive terms were available in any language (Inl.,p.14).

The things described by him were unknown to his predecessors, and therefore had no names. He has taken great pains to make his 'newly compounded Dutch names' as apposite and meaningful as possible, and though many readers may find them obscure and harsh at first, they will get used to them. In the few cases in which foreign 'vocabula artium' more or less correspond to his own, they are added to the Dutch terms. (See also his redefinition of a number of traditional terms, M. pp. 87 ff).

Notes to Chapter I

1) The last-mentioned treatise, though traditionally attributed to Boethius, seems to be really the work of Marius Victorinus. Boethius' logical writings are to be found in J.P. Migne's *Patrologia Latina*, LXIV, 9 - 1216.

2) 'Essentia' for Aristotle's οὐσία is attributed by Quintilian to the Stoic Plautus (*Inst. Or.*, Bk. III, VI, 23 and II, XIV, 2 ('a harsh new word')). It seems that Cicero was the first to identify 'substantia' with 'Natura'.

3) On his use of the term 'letter' see below, Chap. III.

4) Boethius is responsible for these Latin terms, as also for 'praedicamenta' to render κατηγορίαι. The foundations for Latin logical terminology were laid by Cicero in his *Topics*.

5) Cicero (*Top.* V, 17) makes this distinction between division and partition. In his translation of Cicero's *Topics* (Loeb Classical Library), H.M. Hubbell renders 'divisio' by 'analysis' and 'partitio' by 'enumeration'. Note that Diogenes Laertius, VII, 61 f, uses διαίρεσις in the sense of Cicero's 'divisio', but μεροτόμος in a different sense from Cicero's (and Montanus') 'partitio'.

6) Alsted, p. 442: *Lex collocationis, seu generalitatis jubet, ut à generalissimis per subalterna descendatur ad specialissima. Dicitur etiam lex coordinationis, collocationis, item antecessionis et consecutionis.*

Classification, being an ascending process, is the opposite of division (cf. L. Susan Stebbing, *A Modern Elementary Logic*,

4th ed., London, 1949, p. 106).

7) Cf. Fabricius ab Aquapendente, *De Locutione*, p. 25; Joh. Clauberg, *Logica Vetus et Nova*, 2nd ed., Amsterdam, 1658, p. 1.

8) 'Coup de canon' rather than Pernot's 'coup de fusil' (op. cit. p. 176).

9) The change in meaning which this might entail would be part of the change in form, since 'vox est materia, significatio est forma'. (See Keckermann, Cols. 554, 639, 639, 642, 667; Coke, pp.15, 69, 72, 85; Alsted, pp. 266, 414, 765; Burgersdijk, pp. 54, 105, 156.) But Montanus is not at all concerned with meaning in 'The Art of Speech'.

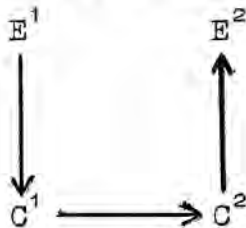
10) On early speech synthesisers see Panconcelli-Calzia, *Quellen-Atlas zur Geschichte der Phonetik*, Hamburg, 1940, pp. 26 ff, 46 ff (his list opens with Heron of Alexandria in the 3rd century B.C. and Philo of Byzantium, 2nd century B.C.); Barney and Dunn in *Manual of Phonetics*, ed. by L. Kaiser, Amsterdam, 1957, p. 203; Scripture, *The Elements of Experimental Phonetis*, New York, 1904, pp. 290 f; Gutzmann, *Physiologie der Stimme und Sprache*, Braunschweig, 1909, pp. 118 ff.

11) It is interesting to see how closely Coke follows Keckermann. Keckermann's '... obiecto circa quod rei actio versatur' (Col.623) is rendered by Coke '... to the object about which the Action of a thing is busied' (p. 59) and Keckermann's 'Objectum est, circa quod res vel rei operatio versatur' (Col. 643) becomes 'an object is about which a thing or operation of a thing is busied' (Coke, p. 73).

Montanus (Bk.I, p.2) uses the same idiom: 'The ground about which this art is busied', probably translating Alsted, p.618. His 'The ground .... is the way to speak' also follows Alsted (Cf. Alsted, p.6: (Grammaticae) subjectum est modus purè loquendi, p.7: (Rhetoricae) subjectum est modus ornatè dicendi. (Logicæ) subjectum est ... modus bene disserendi, etc.).

12) Cf. Descartes' methodic doubt. 'The Art of Speech' appeared two years before the 'Discours de la Méthode', see Verschuur, p.25, fn.1.

13) Montanus' procedure may be represented diagrammatically by the following figure:



in which C stands for Cause, and E for Effect.

Reasoning by induction followed by deduction was practised by Aristotle himself, though it must be admitted that his theory was better than his practice. (Cf. Marshall Clagett, Greek Science in Antiquity, London, 1957, pp. 25 ff.)

CHAPTER IIThe Introduction

The full title of the book runs as follows:

A Treatise<sup>1)</sup> on a new Art, named The Art of Speech, discovered and described by Petrus Montanus of Delft, Minister of the Word of God at Nieuwen Hoorn.

In which is treated and brought to light the true and hitherto hidden nature of all pronunciation: and, particularly, of the old and many new letters, of the word members, words, sentence slices, sentence members, and sentences:

of great use and service to all people, and in particular to all common schoolmasters, teachers and learners of languages, poets, those who are interested in logic and physics, physicians, and parents, as is shown in the Introduction: in which are also described some needful parts of the Art of Spelling.

At Delft, printed by Ian Pietersz VVaalpot, at the Printing-House near the Town Hall, 1635.

The vignette on the title-page shows a mountain (an allusion to the writer's name), on which grows a tree, to the stem of which is attached a diptych with some of Montanus' phonetic symbols written on it. On each leaf of the diptych sits a parrot nibbling at a fruit, oval in shape, hanging from the tree. The tree is flanked by plants with diacritics on their leaves. In the foreground we see another parrot and a spade for delving (a reference to the author's native town Delft).

The opening words of the poem underneath ('Letter op') are repeated in the vignette. They contain a pun on the word 'letter' (cf. p. 13, Inl.), and a rearrangement of the five letters printed in bold type will yield a version of the author's Christian name (Peter).

The text of the poem runs: Mark the strange fruits growing on this delved mountain. Pick them, try them, and do not be afraid that they will leave an unpleasant taste. Just as the parrots assume the semblance of man by eating them, you will be improved by them and be more like God's image.

The poem on p. 2 contains another pun on Montanus' name (Berg) and on p. 31 (Inl.) Montanus points out that a rearrangement of the letters (and omission of the a) in one alternative title of his book (Spraeck-bericht) will give the genitive of his name (Petri Berchs), and that another title (des Spreeckunst Bericht) can be twisted into another genitive (Petri de Berchs), which may precede these titles.

He is so pleased with this remarkable fact that he decides to celebrate it in three poems, also printed on p. 31 (Inl.), and winds up by suggesting a suitable Latin title for his book, viz. 'Montani Monstratio', which contains the word 'mons', while 'Monstrationis' contains 'Montani', and by playing about with 'Penitus nitere de Monstratione', and 'Super Petraeum montem aedifica gnaviter', (cf. 'the mountain of stone (Berch van Steen) in the poem at the foot of p. 6.)

In the Dedication to the Provincial States of Holland and West Frisia<sup>2)</sup>, dated 18th May, 1635, Montanus expresses his conviction

that 'The Art of Speech' would provide even the most ignorant schoolmasters and schoolmistresses with a far more efficient method of teaching even the smallest children to read and spell than has so far been applied, so that more time would be available for the instruction of the children in godliness and other edifying things.

The Dedication is followed by two poems of the customary laudatory type and a long poem by Montanus himself, entitled 'Of the principal end of the outward works of God, and particularly of speech.'<sup>3)</sup>

The following remarkable statements occur in the last poem: (Inl. pp 5 f) The fact that Christ is identified with the Word (λόγος) is a measure of the importance of speech, and the Third Person of the Trinity, the Holy Ghost, derives his name from one of the actions of speech, viz. breathing (spiritus, πνεῦμα) (cf. p. 11, Inl. ).

Speech is a deed rich in ingenious tools and matter and it can be divided into thousands of species, so that everything in the world can be signified by it. And, what is even more surprising, although there are at least a hundred different languages, in each of them there is a word for every thing, and one and the same thing is expressed by markedly different sounds in different languages. Moreover, there is an infinite number of sounds in speech which are not used to indicate things, so that the number of sounds far exceeds that of things.

The Introduction opens with a chapter on the invention of the art of speech (pp. 7 f, Inl.). 'By calling this art new I do not

mean to imply that no one else <sup>has</sup> ever discovered and described anything of what is treated in this art. All I want to say is that none of my predecessors has given the form of a special art to the matter. They have dealt with it partly under grammar, partly under poetics and rhetoric, and those who appear to have dealt with it in special volumes, have claimed to deal with the pronunciation (Pronunciatio) of a particular language, but have, in effect, dealt with letter-symbols and what they stand for, not with the nature of speech. Nor do I know of anyone who has written about pronunciation in general<sup>4)</sup>.

What I have added to our knowledge of the subject is infinitely more than what was discovered confusedly and imperfectly by my predecessors. If, for the moment, we confine our attention to the letters, it will be seen that I have discovered their identity, their nature, their number, their parts, their causes, and the resemblances and differences between them.

What was known was hardly more than the identity of the old letters. (Inl. p. 8) I have added many high genera and a multitude of low species of letters.'

He then breaks into poetry again and shows how one can use the word 'new' seventeen times in the course of twelve lines of verse without thereby heightening the poetic effect to any appreciable extent. The name of his parish, Nieuwen Hoorn, and other geographical names containing the word 'New' play a prominent part in this poem.

On the actual invention of the art of speech, see above, 1.8.

Chapter II of the Introduction (pp. 9 - 13, Inl.) is mainly concerned with the general and special uses of the art of speech. It contains a more elaborate statement of the ends of the art of speech mentioned on pp. 2 ff of Bk.I and already referred to in the present account (see above, 1.61).

One general use of this art is that by mastering it anyone may arrive at a thorough understanding of the nature and causes of two of the most wonderful and praiseworthy things in the world, namely speech and writing. It is a disgrace that people who claim to be wise and learned have a knowledge of things which are outside them, and are completely ignorant of the means which enable them to reveal this knowledge.

In addition, this art will facilitate the acquisition of the power to speak well, i.e. to produce various species of speech such as letters, syllables, words, word groups, and sentences, with their proper quantity, degrees of height, and junction, to introduce, on occasion, the necessary metaplasms or changes, to break up speech and put it together again (which are the ground of reading and writing. Cf. Bk.I, p.3, where the ability to pronounce and identify sounds in isolation is mentioned as another desirable skill), and to spell correctly.

(Inl., p. 10) Throughout the world the art of rhetoric is held in high esteem, but a considerable part of its subject-matter really belong to the art of speech, such as the *periodi*, *euphonia* or *iunctura*, *numerus oratorius*, *figura dictionis*, and *pronunciatio*. [Cf. Alsted, pp. 382: *Junctura est literarum et syllabarum suavis, plena, et sonora connexio: vulgò sonus oratorius, quo figuræ rhetoricæ suaviter afficiunt aures.*



Periodus est circuitus orationis plenam sententiam ornate absolvens.

Numerus rhetoricus est conveniens sententiæ sonus ex pedum permixtione nascens.

Græcis ῥυθμός: quia efficit, ut collocatio verborum quendam quasi rhythmum efficiat.

p. 384: Numerus oratorius est quasi metrum imperfectum.

Figura dictionis, seu verborum, est, quâ artificiosa verborum inter se collocatio regitur, ad ornandam orationem.

p. 484: Pronuntiatio orationis est, quâ illam aptè enuntiamus.]

Similarly considerable portions of the art of grammar belong here, such as prosodia in its entirety, and the principal part of orthographia, and a thorough knowledge of the remaining parts of grammar is completely dependent on these two.

How unbecoming it is for a person to have some defects of pronunciation, whether these consist in his inability to pronounce certain letters correctly, or in his failure to connect lettered speech adequately and to cause it to rise and fall properly and in the appropriate places. These faults, as well as poor spelling and a loose and halting style in writing, are of frequent occurrence. They not only mar the elegance of a person's language, but may actually interfere with its intelligibility. Such defects can be corrected by this art. God himself considers correct pronunciation an excellent gift which renders man capable of great things. This appears from Exodus, Chapter IV, where God recognizes this as an excellent thing in Aaron, and therefore uses him to address Pharaoh and the elders of Israel. (Exodus iv, 14 f, 29 ff; v, i.)

This art is of special use to a great many people. In the first place to the common schoolmasters, whose method of teaching reading and writing has so far been woefully inadequate. Once they have mastered this art, they will be in a position to devise such means as will enable them or their assistants to impart, far more rapidly than hitherto and with less trouble and confusion, a more perfect knowledge of reading and spelling not only to older people of more mature intellect and judgement, but even to the smallest children. This was proved by an experiment<sup>5)</sup> which I carried out a few years ago, when I had first invented this art, on my child, who was only four and a half years old at the time, and who was taught by my wife, with very little trouble and in about six months, to read and spell with greater perfection and accuracy than others who had been taught in the old way, so that all the world marvelled at it.

The experiment on the illiterate adult mentioned on p. 6 preceding the Introduction and referred to above (1.61) was made after this section of the Introduction had already been printed. The adult, a married labourer 'with a poor memory and an untrained mind', received two lessons every day from Montanus himself, who applied a new, and even better and easier method than the one used by his wife in teaching their child. At the end of a fortnight the man was able to spell all the syllables occurring in the Dutch language and was beginning to read them as well. A week later he could read intelligibly and with understanding the sentences and stories which Montanus wrote down for him in his own spelling, although they

were full of long and difficult syllables.

Montanus, who at the time of writing is preparing a treatise on the teaching of reading, ends this account by saying that the experience with his child has taught him that once a person has fully mastered Montanus' spelling, he will have no difficulty in reading badly spelt sentences and books either.

(Inl., p. 11) The Art of Speech will also be extremely useful to teachers and learners of languages like Latin, Greek, Hebrew, Arabic, French, Spanish, and English. In order to learn a language well it is necessary to master its correct pronunciation, which is its ground and matter<sup>6)</sup>. It is impossible to do this adequately without this art, but with its help it can be done thoroughly and easily. There are in every language some special ways of pronouncing, and there will always be a few letters which one's mother tongue and other languages which one has learnt do not possess, and they must be learnt from this art, which contains a 'pronunciation' and alphabet of all languages.

[ Montanus is under the impression that he has written a handbook of general phonetics. On p. 5 (Bk.I) he makes a distinction between the general art of speech, 'which teaches the way to speak without respect to special languages', and special arts of speech 'which are concerned with special languages, such as Dutch, Latin, Hebrew', and adds that he does not now intend to deal with the latter.

He goes on to say: 'Further, in treating of the general art of speech one may and must indicate some special pronunciation, namely (?) (Dutch: met namen) the most perfect, or some element

in it, as a rule or example of (or: to ?) all others in general'. It is not clear to me whether Montanus wishes to hold up one type of pronunciation as an example to speakers of other types, or to describe one type as representative of a number of types. Neither would have much relevance to general phonetics.]

People wanting to learn a foreign language have always been obliged either to travel, at great expense and personal peril, to the country where it is spoken, or else continually to seek the company of those educated in that language. And even after many years of practice they often retain such grave faults of pronunciation that they are the laughing-stock of those who pronounce the language correctly <sup>7)</sup>. Even if they mispronounce no more than one letter, they mangle everything they say, since each letter occurs frequently, and not only offend the ears of those who are used to the correct pronunciation, but also run the risk of not being understood.

There are Germans whose only mistake in speaking Dutch is that in certain positions they pronounce an alveolar l or n instead of our dental l or n, and English people who spoil their Dutch completely by using  $\gamma$  [g] for our g [ $\gamma$ ]. Such people never get rid of these faults, no matter how long they stay among us, because, through lack of this art, they do not and cannot know what is wrong with their pronunciation.

This art is useful to people wanting to teach or learn a koine, a national language <sup>8)</sup>, a regional or provincial dialect, a local or town dialect, or courtly or rustic speech, for each of

those has special features of pronunciation, which can be easily taught and learnt with the help of this art, but hardly or not at all without it.

A correct pronunciation of foreign languages or of dialects of one's own language is of great importance, not only because it makes for elegance and intelligibility, but also because it is a gift of the Holy Ghost, and being devoid of it may have evil consequences for the speaker.

(Inl., p. 12) The gift of tongues which the apostles received from God on the fiftieth day is elaborately described by St. Luke in Acts ii (4 ff), and Peter's want of it and the danger to which it exposed him, by St. Matthew (xxvi, 73). And 42000 Ephraimites lost their lives through a foreign accent (Judges xii, 6) <sup>9)</sup>. Similar things still often happen in war and under various other circumstances.

That the true pronunciation of ancient languages like Hebrew and Greek is not fully known to-day, that there is so much dispute about it among grammarians <sup>10)</sup>, that long pages are being filled with sheer guess-work, and that these ancient languages, though written in one way, are pronounced and read in a variety of ways <sup>11)</sup>, is solely due to ignorance of this art. Many teachers of languages complain in their writings that pronunciation cannot be described but only taught by oral demonstration <sup>12)</sup>, which is often inconvenient or rendered impossible by their death.

This new art can remove all those ills. It lays the foundations of methods by means of which people absent or living in times

to come can be shown all pronunciation far more accurately than by oral demonstration <sup>13)</sup>. By it a person who is unable to learn certain sounds by simple imitation can be taught those sounds from their causes.

This art is not only useful, but absolutely indispensable to poets, for their work, in so far as it consists in the production of measured and rhymed speech-sounds <sup>14)</sup>, should be based on this art.

As, however, I have not discussed this aspect of the art in the body of the book, I shall not say any more about it here.

Those who feel attracted towards what is called logic or dialectics may read this book with profit, because they will find in it rare examples of descriptions, series, partitions, and divisions, over which I have taken as much trouble as over the discovery of the actual facts.

Those who are interested in physics, i.e. natural science, will derive no small advantage from this art, because in it the true nature of sound is discovered anew, and especially that of the sound of animals, and more particularly of man, which is the most wonderful, both on account of the great changes which take place in it, and the manifold tools and movements which cause it. Anatomists and physicians, both consultants and surgeons <sup>15)</sup>, can learn here a new description and partition of the mouth and other parts adjacent thereto, as well as the action and use of each of them in producing speech. Likewise, it will teach them that there is a voluntary motion about the throat, hitherto undiscovered, the muscles responsible for which have still to

be found. All this provides useful information to those who seek to remedy defects of those parts without causing harm to speech, and to improve (Inl., p.13) defective speech by removal or addition. It also points the way to correct diagnosis of injuries and accidents <sup>16)</sup> of the organs of speech from the way the patient speaks.

Just as physicians, in order to be able to cure the diseases that the eyes are subject to, should be skilled in optics, they ought to master the art of speech to be able to treat accidents of the mouth and adjacent parts.

This art could be also be helpful to parents who, through ignorance of the causes, do not know how to deal with speech-defects in their children.

The dignity of this art may seem slight to many, because it is concerned with the first things taught to children. But it is as foolish to despise this subject as it would be to feel contempt for bread, just because it is eaten by the humblest. And persons of great learning and high rank, such as emperors and generals, have not thought it beneath them to write books about the elements of this art <sup>17)</sup>.

Moreover, beginners are only taught the rudiments, while the higher description of the subject, as presented here, will exercise even the most highly trained minds. The same thing can be seen to happen in arithmetic, whose elements can be taught to children, while its higher description, comprising causal proof and the treatment of figured or geometrical, and cossic or algebraic numbers <sup>18)</sup> is studied by the most intelligent, and is, therefore, held in high esteem.

Notes to Chapter II

- 1) Pernot's 'annonce' translates the modern meaning of 'bericht'. (*Revue de Phonétique*, 5, p. 169)
- 2) The dedication is not to the States-General, as Pernot (p. 171) suggests.
- 3) The Persian king referred to on pp. 3 f is Ahasuerus, the husband of Esther, better known as Xerxes, and Zuzan is Shushan, the royal residence ( see *The Book of Esther*).
- 4) Madsen's 'De Literis' was intended as a treatise on general phonetics (see Madsen, p.8).
- 5) Cf. Hart, *A Methode*, ed. Danielsson, p. 237; and Robinson, see Dobson, *T.P.S.*, 1947, p. 31.
- 6) Cf. Robinson, ed. Dobson, p. 8.
- 7) Cf. Robinson, p. 6.
- 8) This is the best I can do for Montanus' 'Hoofttaelen' and 'Volctaelen'. It is clear from what he says on p. 135 ('onze Duitse Hooftspræc, en haer onderspraeken, voornaemelijc de Neederduitse') that he looked upon Dutch as a form of German. The word 'Dutch' (whose original meaning is '(the language) of the people (as opposed to Latin)') was used to refer to Dutch as well as to High German (cf. 'High and Low (or Nether) Dutch in seventeenth-century English usage)). High German would be an example of a 'Hoofttael', and the language of the Dutch Republic may have been looked upon as a 'Volctael' by Montanus. The meaning of the other terms, 'lanttaelen' and 'Stattaelen' is clear from the examples given by

Montanus. For a modern use of the word 'koine' see Trevor Hill, *Institutional Linguistics, Orbis*, vii, 1958, pp. 441 ff.

9) In his discussion of the *Subjectum Tractationis* of the *Art of Speech* (Bk.I, p.2, see above, 1.7) Montanus refutes the argument that speech is by nature and that, therefore, it need not be taught, by saying that the power to learn to speak is natural, but good speech and the pronunciation of foreign languages have to be taught and learnt by art. If speech were by nature, why could not the Ephraimites pronounce the word 'shibboleth', though they heard it spoken (by the Gileadites), and their lives depended upon it ?

On p. 80 of 'The Art of Speech' the English with their [g], which Montanus surprisingly looks upon as a sound peculiar to English are compared to the Ephraimites.

A reference to the Ephraimites' inability to pronounce [ʃ] occurs in several sixteenth- and seventeenth-century writers (e.g., Madsen, p. 126; Wilkins, pp. 369 and 382).

Cf. David Abercrombie, *Elements of General Phonetics*, Intr. 8.

10) The most important treatises on Greek pronunciation that had appeared by Montanus' time were collected by S. Havercamp in his 'Sylloge' and 'Sylloge Altera', Leyden, 1736 and 1740. Cf. A.J. Ellis, *The English, Dionysian, and Hellenic Pronunciation of Greek*, London, 1876; I. Bywater, *The Erasmian Pronunciation of Greek and its Precursors*, London, 1908; Blass-Purton, 1890; Sturtevant, 1940; Dobson, *English Pronunciation 1500 - 1700*, I, pp. 38 ff.

11) Cf. Robinson, ed. Dobson, p. 5; Cooper, 1687, ed. Sundby, p. 22; Amman, Dutch version of 'Surdus Loquens', p. 181.

12) Cf. Hart, *An Orthographie*, ed. Danielsson, p. 194; Wilkins, p. 363: It will be difficult to express the several powers of these vowels by writing; Pronunciation being such a thing, quae nec scribitur, nec pingitur, nec hauriri eam fas est, nisi vivâ voce (*Lipsius de rect. Pronuntiatione Lat. cap.3*). Cooper, 1687, p. 12: (vowels) may be more certainly and easily understood and learnt by the Ear than by the writing; for a letter is not the lively representation of a sound; because a sound cannot be perceived by the Eyes.

13) Cf. Hart, *A Methode*, p. 232; Robinson, p. 7; Lodwick, *An Essay towards an Universall Alphabet*, *Phil. Trans.* 1686, p. 127, and MSS Sloane 913, (fol. 23b), 897 (fol. 26a and b); see also Amman, *Surdus Loquens*, 1692.

Similar claims were made, in more recent times, by A.M. Bell.

14) 'Saemen-gepaste en vergeleeke Spraecgeluiden', connected (?) (cp. *oratio ligata*) and compared speech-sounds.

15) 'Raetheelders of Wercheelders'

16) 'hinderigen (impediments ? ) en toevallen'

17) Cf. Quintilian, I, vii, 33 ff, and similar passages in Ramus, Beza, Oelinger, Garnier, Madsen, Wilkins, Holder, and many others.

See also Cicero, *De Officiis* I, 42 on *Artes illiberales et sordidæ*; Amesius, *Opera Omnia*, Vol. V (*Technometria*), pp. 31 ff on *Artes (facultates) digniores* (subdivided into *superiores* and *inferiores*) and *minus dignæ*, cf. Alsted, p. 64 and Keckermann,

1333, Tabula XXV.

18) On Arithmetica specialis scientifica Concreta Cossica,  
sive Algebraica, see Alsted, p. 11.

## CHAPTER III

SPEECH AND LANGUAGE

Montanus makes an interesting distinction between speech (*spraec*) and language (*tael*), which underlies much of what he says in the Introduction, but which is not explicitly stated until the opening pages of Book I. Unfortunately the first paragraph of page 1 is rendered obscure by Montanus' use of the ambiguous word beteikening (cf. Eng. betokening), no doubt rendering the equally ambiguous significatio, and the misprint beteikende (= signified) for beteikenende (= signifying). The latter point is cleared up by page 10 Inl., where speech is defined as 'the thing signified by writing, and the signifying matter of language'.

This is how Book I, Chapter I opens:

'The Art of Speech is an art teaching the way to speak. By speaking I mean the production of those sounds of the mouth which can be the signifying matter of languages, but which are here considered without respect to the signification for which they are normally used'.

I take this to mean that in phonetics (the art of speech) the noises which are the vehicle or medium <sup>1)</sup> of spoken language are studied without reference to the meaning which they convey in language.

The word 'signification', I think, should here be taken in the sense of 'meaning' rather than 'representation by symbols', in view of the clause 'for which they are normally used', which follows it.

[Cf. Alsted, p. 765: Sermo consideratur quantum ad materiale et formale suum. Materiale sermonis est vox articulata: formale est vis notificandi sive significandi imagines rerum intellectu conceptas, atque adeo voluntatem et affectum.

Burgersdijk, p. 118: Vocabula vel accipiuntur materialiter, vel formaliter. Materialiter dicuntur accipi, cùm accipiuntur pro seipsis. Formaliter, cùm accipiuntur pro rebus significatis. Ex. gr. cùm dico, Animal est trisyllabum, neutrius generis, tertiæ declinationis; Homo est dissyllabum, communis generis; vocabula homo et animal sumuntur materialiter, hoc est, per se ac pro seipsis, haud secus, ac si nihil omnino significarent. At cùm dico, Homo est animal, vocabula homo et animal sumuntur formaliter, hoc est, pro rebus quas significant ex instituto.

All this probably goes back to the Stoic theory of language with its distinction between λέξις, which may be ἄσημος, and λόγος, which is always σημαντικός, and the corresponding verbs προφέρεισθαι and λέγειν. In the latter φωνή is τὸ σημαῖνον; what is signified by it (τὸ σημαινόμενον) is τὸ λεκτόν, i.e. the thought content in so far as it is uttered in sound. (Sextus Empiricus, Adversus Mathematicos, VIII, 80; Diogenes Laertius, VII, 57 and 63).

Cf. Steinthal, I, p. 292: Any λόγος can be considered as a λέξις by abstracting from the sense. This is done in phonetics and metrics.

The Stoic distinction between 'the mere word' and 'the meaningful word', which had its roots in Aristotle's 'De Interpretatione', was handed down to the Renaissance through such

medieval writers as St. Augustine, Boethius, Abelard and Petrus Hispanus (see J.J. Baebler, Beiträge zu einer Geschichte der lateinischen Grammatik im Mittelalter, Halle a.S., 1885; F. Sassen, Geschiedenis der patristische en middeleeuwse wijsbegeerte, 4th ed., Antwerpen, 1950; P.A. Verburg, Taal en functionaliteit, Wageningen, 1952.).]

It may be pointed out that Montanus' 'sounds of the mouth' should not be interpreted as 'phonemes', which are, of course, meaningless in themselves, but as φωναί or 'voces' or Montanus' own 'speeches', i.e. letters, syllables, words, 'sentence slices', 'sentence members', and sentences.

[ Cf. Aristotle's use of φωνή for στοιχεῖον, συλλαβή, σύνδεσμος, ἄρθρον, ὄνομα, ῥῆμα, and λόγος (Poetics, C. 20), the Roman grammarians' use of 'vox', Ickelsamer's 'Stymm oder laut', Meigret's 'voix', Hart's 'Voices and speches' (The opening, 1551, Sundby, p. 118), 'the seuerall voices of the speach' (An Orthographie, 1569, Sundby, p. 171), etc.]

Montanus continues (Bk.I, Chap.I, p.1):

'The proximate genus of the art of speech may be said to be the art of the matter of signs, whose species are the arts which teach the way to make matter by means of which something is signified by convention.

One such species is the art of writing, which teaches the way to make matter by means of which speech is signified (= indicated) visibly. Another is the art of speech, which teaches the way to make audible matter by means of which all kinds of things are signified. The latter is also a species of the art of sound,

because it teaches the way to produce a kind of sound. It should be observed that I distinguish four arts, viz. the art of speech, the art of marks or shapes (i.e. the art of writing), the art of language, and the art of language-symbols (i.e. spelling). These four arts, or at any rate three of them, have so far been confusedly dealt with under grammar, or the art of letters, partly because their special uses and the distinction between them have not been fully realized, partly because the knowledge of each of them has been so limited that there has not been enough matter for them to be treated as separate arts.

I believe, however, that there is so much difference between them that they should not be brought under one heading and that they provide enough material for four separate treatises, all of which I hope to publish in time.

The difference between speech, language, marks and symbols is that speech and marks are Qualitates, i.e. figures or shapes, the former audible, the latter visible, while language and symbols are Relationes or signs of audible and visible matter, respectively'.

[Cf. Alsted, p. 625: Qualitates sunt instrumenta formarum, quia substantiæ et formæ sunt efficaces per qualitates. Unde qualitas dicitur filia formæ.

Alsted, p. 766: Facultas canendi et scribendi est gradus quidam facultatis sermocinandi. Formale sermonis est relatio illa et vis significandi quâ voces articulatæ signant imagines rerum intellectu conceptas, et ex istis imaginibus ortum affectum.]

In other words, speech and writing are concerned with sounds or shapes considered in themselves, language and spelling with significant sounds and shapes. Relatio refers to the representational or denotative use of these sounds and shapes.

'Hence the art of speech teaches the way to make sounds, the art of writing teaches the way to make visible shapes, the art of language teaches the way to use audible signs, the art of spelling teaches the way to use visible signs. (Underscoring mine. A.V.)

It will be clear from the foregoing that these four arts do not correspond to the traditional four parts of Grammar, viz. Orthography, Prosody, Etymology, and Syntax, nor to the bipartite division of Grammar into Etymology and Syntax by which others seek to improve upon the old division'.

On the basis of the above division Montanus distinguishes four kinds of words (M., p. 130).

A word may be:

1. A spoken sound signifying something (a language-word).
2. The same sound without respect to its meaning (Montanus here uses the unambiguous word beteikenis) (a speech-word).
3. A number of signs, whether written or made in some other way, indicating such a sound (a spelt or symbolized word).
4. The same or similar signs without reference to signification (beteikening) (a written word).

In 'The Art of Speech' 'word' should always be taken in the sense of speech-word.

Where Montanus refers to words as used in language, he uses the term 'language-word', (except on p. 50, where the meaning of 'words' is clear from the context), e.g. p. 73: ... it is not always necessary in actual usage to distinguish the single u's according to the shape of the floor (sc. of the mouth). These differences do not always give rise to different language-words, ...

p. 81: Glottal stops are not used as essential parts of any language-words, and, therefore, they are not indicated in writing by symbols, whether proper or improper <sup>2)</sup>.

p. 109: The exact number of letters in multiples is often not so important. The meaning of language-words is not altered, whether we say 'jjj' or 'jjjj', 'aa' or 'aaa', etc.

As we have seen (M., Bk.I, p.1), the arts of speech and writing are species of the art of the matter of signs. It appears from pp. 7 and 16 of the Introduction that the arts of language and spelling are species of the art of signs. On both these pages we are told that 'Beteikening' (Significatio) (which here means nomenclature, terminology, and phonetic notation, including the use of diacritics), does not really belong here, but should be handled by the arts of language and spelling, which are arts of signs, the implication being, of course, that there is a relatio between language and things, and between spelling and the speech-sounds represented by it, and that the art of speech is not concerned with either.

[Cf. Francis Lodwick, MS Sloane 932 fol. 5b, C.1650: Syllables should be taught 'without any regard had whether they are

significant or no, for the end of this art is directly to be able to express the sounds described, the understanding of the meaning of them relateth to grammar'. Cf. fol. 6a for similar remarks on the teaching of words, and Lodwick, An Essay towards an Universall Alphabet, Phil. Trans., 1686, p. 135 and MS Sloane 897 fol. 30a]

Montanus obviously forgets that he is using Beteikening in a very special sense here, and that phonetic terminology, notation, and diacrisis certainly belong to phonetics. 3)

He also points out on p. 7 Inl. that Pronunciatio as dealt with by grammarians and rhetoricians is concerned with written symbols and what they stand for (the things signified by them), and not with the nature of speech. It, therefore, does not belong to the art of speech, but to the art of spelling.

On p. 5 of Bk.I (Chap.II) Montanus returns to the subject of speech and language.

He here defines speech as 'the voice which is used as the signifying matter of languages.' He realizes that the terms 'speech' and 'language' are often used indiscriminately, but the reader should know that in this book the term 'speech' (spraec) usually means the matter of languages, which is identical with what is more distinctively called 'pronunciation' (uitspraec).

(M. Bk.I, p.6) The proximate genus of speech is the voice (de stem), which is an air-breathing sound receiving its essence in the throat. It differs from whistling, which, though also an air-breathing sound, receives its essence outside the throat. 4)

The voice also differs from sucking, sputtering, and smacking, and other noises of the head, which I hope to explain in detail at a future date.

The genus voice comprises three species of sounds of the breath: 1. voice-tone (i.e. 'voice' in the modern technical sense), 2. voice-rustling (i.e. noise or friction), 3. voice-rustling tone (i.e. voice and noise or friction combined).

[Montanus' inclusion of friction among the species of 'the voice' is incorrect, since it does not 'receive its essence in the throat', except in the case of [h] (and [ʔ], which in Montanus' terminology is an 'abortive rustler'). That he realized this himself is clear from Montanus' Book I, page 15: 'a rustling-hole (i.e. a place where friction originates) can be in any part of the lower vessel' (see below, Chap. IV, The Organs of Speech) and from the fact that the only throat-rustler turns out to be [h] (Bk.II, p.51 and Appendix, pp. 159 f. where the throat letters are divided into those of the larynx and the uvula, and [h] and [ʔ] are located in the larynx). See also Book II, page 35; below, 5.2.]

In the above definition of speech the specific difference ('which is used as the signifying matter of languages') excludes the other voices which might be referred to as gibberish or cacophony (*wanspraec*), and which do not serve as matter of language. Note also that this book deals with 'loose' or ordinary speech and not with the other species of speech, such as singing-speech, metrical speech, and poetical

speech. 5)

On the whole Montanus observes his own distinction between 'speech' and 'language' very carefully, but in one or two places his handling of the terms is a little confused and confusing.

On pp. 36 f of Book II he lists 'the common species of the speeches or pronunciations' referred to elsewhere as 'species of speech' and 'speeches'. They are the letters, syllables, words, sentence slices, sentence members, and sentences. He intends to deal with all of them in 'The Art of Speech', but, as we shall see, at the end of the book on sentence members (Bk. VI) he tells us that he has decided to postpone the publication of his book on sentences.

(p. 27) The above species of speech are common, because all special speeches consist of them, such as Latin, French, and English (cf. Bk.I, p.5). Many more could be added to the six listed above, e.g. 1. speech slices, whose proximate matter consists of sentences, 2. speech members, made up of speech slices, and 3. speeches or pronunciations in the narrow sense of the word, which correspond to what the Romans call orationes or otherwise. 6)

The table on page 27 contains the following rather enigmatic statement: Letters and Syllables are the remote matter of the languages and signs (der Taelen of Teikenen), while words are the proximate matter of simple signs or language (enkelde teikenen of tael), and the higher units are the proximate matter of complex language (dubbelde tael). Presumably this means that letters, syllables, words, etc., as speech or

speeches, i.e. taken materialiter, are the matter of words, etc., used in actual language, i.e. taken formaliter, and of the symbols which represent them in written language, and that a language-word is simple language, while any unit made up of more than one word is complex language.

Letters and syllables are also said to be imperfect speech, words are perfect speech made up of imperfect speech, and the higher units are perfect speech made up of perfect speech, i.e., words.

The letter is first or original speech, the syllable and the higher units are derivative or lettered speech, the word is not only lettered, but also syllabled speech, the sentence slice, in addition, is worded, the sentence member and the sentence are sliced speech (as well as worded, syllabled and lettered).

On page 42 we learn that most of the flat, moderately hollow, and hollow vowels are used distinctively in the words and languages, on page 44 that both snap and steady vowels are much used in the speeches, and on page 50 that it would take too much time to find out whether all his 2520 species of letters are pronounceable, and, if so, whether they are used in the speeches.

And compare p. 11, Inl. 'Hoofttaelen of Volctaelen', with p. 135 'onze Duitse Hooftsprac, en haer onderspraeken, voornaemelijc de Nederduitse' (see above, Chap. II).

Montanus carefully distinguishes between 'speech letters' and 'spelt letters', i.e. symbols by which they are represented in

writing (cf. pp. 22, Inl., 97 and 117). In one place (p.13, Inl.) he contrasts the letter on the lip with the letter on paper.

Apart from his use of the word 'letter' for 'sound' and his insistence on appropriate names for the letters there is surprisingly little in Montanus to remind us of the traditional theory of the letter (for which see D. Abercrombie, What is a 'Letter?', *Lingua* II, 1, Aug. 1949, pp. 54 ff, and Caron, 1947, pp. 10 ff).

As far as I can see, he uses the term 'cracht' corresponding to 'potestas' only once (p. 70) (cf. Lambrecht, 1550, Ce heeft twee crachten, k en s), and makes no statement about the 'accidents' of a letter being its 'name, shape, and power', as do some of the other Dutch writers on spelling and pronunciation (cf. De Heuter, 1581, p. 31: Gedaente/Name ende Kraht; Van der Schuere, 1612, ed. Zwaan, p. 9: 'tMaexel, de Naem, de Kracht ofte Weirdigheyd; A.L. Kok, 1649, p. 5: de Naam, Ghe-stalte en maght; and pp. 74 f of the Dutch version (1697) of Van Helmont's curious little book on the Hebrew alphabet: magt, figuur en naam; de kragt ofte magt van de letteren).

A considerable number of variant terms occur in the Greek, Roman and Humanist writers for 'shape' and 'power' though not for 'name'. For the latter I have only found ὄνομα, 'nomen' and 'appellatio' (Madsen, p. 2). Sextus Empiricus, *Adversus Mathematicos* I, 99, has χαρακτήρ and τύπος for 'shape' and δύναμις for 'power'.

Diogenes Laertius VII, 56, uses γράμμα as the general term (= Lat. *litera*), στοιχείον for the power, and χαρακτήρ τοῦ στοιχείου for the shape.

In the Scholia in Dionysium Thracem we find γράμμα, χαρακτηρ<sup>74</sup>, and τοῦ στοιχείου σχῆμα, for 'shape', and στοιχεῖον, ἐκφώνησις, and δύναμις for 'power' (Bekker's Anecdota, p. 774, 3 and 15; Steinthal II, p. 194).

Dionysius of Halicarnassus (ed. Roberts, p. 268, 16) has τύπος, δύναμις, and, of course, ὄνομα.

On writers who do or do not distinguish between γράμμα and στοιχεῖον see Liddell and Scott, Greek-English Lexicon, s.v. στοιχεῖον.

On the history of the words στοιχεῖον and 'elementum' see Hermann Diels' interesting study 'Elementum', Leipzig, 1899; Diels believes (as against the Scholiast in D.T., Bekker, p. 790, 13; cf. Priscian II, 4, p. 6 Keil) that στοιχεῖον was used in the sense of 'letter' before it acquired the physical meaning it has in Plato, that the plural στοιχεῖα (= alphabet) is older than the singular, that Lucretius coined the word 'Elementum' to render στοιχεῖον, and that it was given general currency by Cicero, who was probably the first editor of Lucretius' 'De rerum natura'.

In the Roman writers I have found (besides 'figura'):  
forma, species, nota, character, and (as variants of 'potestas'):  
vis, sonus, pronuntiatio.

In the Humanists 'valor' is of frequent occurrence.

Reuchlin, 1506, p. 5, has 'uirtus ... atque potestas'.

Priscian II, 4, p. 7 Keil, expressly contrasts 'elementum' (στοιχεῖον) and 'litera' (γράμμα).

Ælfric (ed. Zupitza, p. 5) uses 'nama, hiw and miht'.

The First Icelandic Grammarian's variants are to be found on

pp. 42 f and 47 of Haugen's edition.

The sixteenth-century French writers use 'vertu', 'puissance' and 'valeur' (Tory, 1529; Meigret, 1545; Ramus, 1562 and 1572; Baïf, 1574) and Meigret contrasts 'voix' with 'characterē', 'marque', and 'note'.

Hart, 1551 and 1569, contrasts 'voices, sounds (and breaths), power, vertu, vse' with 'letters, markes, figures, images, carrects, shapes'.

The sixteenth-century Germans use 'Kraf(f)t' and 'Stym' for 'potestas'. (Cf. Albertus, 1573, p. 22: Valor Krafft und Wirckung) Bonet, 1620, p. 33, has 'nombre, figura, y poder'.

Madsen, pp. 173 and 181, slightly modernizes the ancient doctrine. Potestas should not be considered an accident of the litera, because it is the litera. Nomen and figura are its accidents.

Notes to Chapter III

- 1) Cf. D. Abercrombie, *Elements of General Phonetics*, Intr.1 ff
- 2) On 'proper' and 'improper' spelling, see below, Chapter VI
- 3) Montanus was, of course, perfectly justified in using the word 'significatio' for 'notation' the word 'notatio' having, since Cicero, had the special sense of 'etymology', while 'etymologia' often meant 'morphology' or 'accidence'.

Cicero says he uses 'notatio' in this sense, because Lat. 'nota' corresponds to Aristotle's σύμβολον (*De Interpr.* 2), and words are tokens ('notae') of things (see Cicero, *Top.* VIII, 35, and Quintilian, *Inst. Or.* I, vi, 28 on 'notatio' and 'Veriloquium'; cf. Hart, *An Orthographie*, ed. Danielsson, p. 183).

The word *ετυμολογία* was introduced by the Stoics (Steinthal I, p. 331).

- 4) Cf. Wilkins on Whistling, *Essay*, p. 361.
- 5) Cf. Alsted, p. 266, 486, 509, 766, on 'oratio soluta', 'oratio ligata' and 'sermo harmonicus'.
- 6) In the table on p. 32, Inl. Montanus equates his sentence slices with commata, his sentence members with cola, and his sentences with periodi.

On the κόμμα or incisum, the κῶλον or membrum, and the περίοδος or ambitus, see Aristotle, *Rhetoric* III, 9; Demetrius, *περὶ ἑρμηνείας*, I; Quintilian, *Inst. Or.* IX, iv, 122 f; Johannes Sturmius, *De Periodis*, 1550, I.

I do not know what synonym(s) of 'oratio' Montanus had in mind. He may have been thinking of the large number of Latin terms for περίοδος (see Cicero, *De Oratore*, LXI, 204; Quintilian, *Inst. Or.*, IX, iv, 22, 124; cf. Sturmius, *op. cit.*, for some Greek synonyms).

CHAPTER IVTHE ORGANS OF SPEECH

'The Art of Speech' contains a rather fuller account of the organs of speech than most sixteenth- and seventeenth-century books dealing with pronunciation (cf. Ickelsamer, Hart, Madsen, Fabricius ab Aquapendente, Robinson, Bonet, Wallis, Wilkins, Holder, Cooper, and Amman).

(Bk.I, Chap.III, p. 7) Speaking consists in the two simultaneous actions of breathing and forming.

The action of breathing is produced by the respiratory organs (lit. the breathing-tools), viz. the breathing-muscles and the breathing-vessels.

The breathing-muscles cause the breath to enter and leave the breathing-vessels by opening and closing the latter.

(p. 8) The principal breathing-muscles are 1. the midriff (Diaphragma). 2. the eight muscles of the abdomen (Musculi Epigastri), and 3. the eighty-eight muscles of the chest.

Further information about these and the other muscles to be mentioned can be obtained by consulting the works of the anatomists.

The muscles of the head-vessels, and especially those of the throat, might also have been mentioned here, but they are primarily forming-muscles.

The breathing-vessels are 1. the lungs, which are the deepest (sc. breathing-vessels) and the seat of the breath, 2. the wind-pipe, the intermediate breathing-vessel, and the way by which

the breath travels, and 3. the head-vessels, which form the outermost breathing-vessel and the outlet of the breath, and might, therefore, be called the breath-gate.

All these breath-makers resemble the causes of the blowing action produced by bellows. 1) A pair of bellows has for its principal efficient cause a force by which the tools are moved and guided, whether it be the force exerted by a man who opens and closes the bellows, or the force of a heavy body lying on the bellows and causing a blowing action by closing them. The breathing-muscles are comparable to the handles on the thick end of the bellows and the ropes and other tools by means of which large bellows are moved, or to the parts of a man's body used for that purpose. The lungs may be compared to the thick body of the bellows, and the head-vessels to their pipe and mouth and their vent-holes.

(Chap.IV) The forming apparatus consists of the forming-muscles and the forming-vessels or forms. 2)

(p.9) The forming-muscles shape and guide the forming-vessels. There are ten forming-muscles on each side of the throat, making twenty in all.

There are five forming-muscles on each side of the tongue, making ten in all. They move the tongue in a remarkable way by putting it out, drawing it in, moving it upwards, downwards and sideways, and curving it. Some physicians believe there are no more than nine forming-muscles of the tongue.

Of the forming-muscles of the lips, which shape and guide the lips and cheeks, there are eight in all, four on each side, two of which belong to the lower, and two to the upper lip.

The forming-muscles of the lower jaw-bone move and guide the lower jaw-bone and certain parts attached to it. There are ten of them, five on each side, four of which serve to open the mouth and one to close it.

[According to Verschuur (pp. 48 f) these figures agree on the whole with those given by Galen and Vesalius, except that Vesalius gives 68 chest muscles, while Montanus' 88 are to be found in Gui de Chauliac (fourteenth century).

In Fabricius ab Aquapendente's *De Respiratione*, 1615, p. 45, I have found 89 muscles of the thorax, but this figure includes his 8 abdominal muscles as well as the 68 intercostals mentioned on p. 66 (Vesalius' 68 chest muscles). In '*De Musculi Fabrica*', 1625, he tells us on p. 47 that muscles are difficult to count, and mentions 82 thoracic, 10 abdominal and 8 lingual muscles on p. 48.

His predecessor, Fallopius (*Institutiones Anatomicae, Opera Omnia*, Frankf., 1606) says there are 8 abdominal muscles according to some, 10 according to others (p. 430). On p.452 he quarrels with Vesalius over the exact number of certain muscles.

Alsted gives 10 abdominal muscles (p. 757), 8 labial muscles, and 62 thoracic muscles (p. 760).]

To this list might be added the forming-muscles of the nose, but the anatomists only mention those which cause a voluntary motion about the nostrils, which do not play an important part in the formation of speech.

They fail to mention those muscles which I call the nose-door, and which cause a voluntary motion which is responsible for a great change, in fact, for a specific difference in speech, as I shall show.

[As a matter of fact the levator palati and the palato-glossus had been described by Fallopius (1523 - 1562). I do not think, however, that Stevenson and Guthrie (p. 28) are right in stating that Fallopius also invented the term 'velum', as I have not been able to find it anywhere in his works. He uses the term 'palatum molle et pendulum'. Winslow seems to have been the first to refer to the soft palate as 'velum palati'.

(Cf. Joseph Hyrtl, *Onomatologia Anatomica, Geschichte und Kritik der Anatomischen Sprache der Gegenwart*, Wien, 1880, pp. 369 ff. According to Hyrtl no distinction was made between hard and soft palate before the publication of Vesalius' 'De corporis humani fabrica libri septem' in 1543. Panconcelli-Calzia (Leonardo, p. 147) points out that Leonardo da Vinci in his notebooks describes the 'palato mobile', but is not clear about its function).

Fabricius ab Aquapendente indicates 'via obscura narium subiecta columellae' in his 'Figura organorum locutionis' (De Locutione, p. 26; apparently the earliest published drawing of the human head in section showing the organs of speech. As in most of the later drawings of this type the head faces left. Leonardo's similar profile faces right in keeping with the mirror-writing of the text).]

The forming-vessels or forms, which are shaped and guided by the forming-muscles (so as to produce the (p. 10) forms necessary for speech) are certain parts of the head, which in this respect may be called forming-matter, and which in a different respect have already been referred to as head-vessels or breath-gate. The forming matter consists of 1. the throat, 2. the mouth, and 3. the nose.

The throat is forming-matter situated between the back of the mouth and nose on the one hand, and the top of the windpipe and the oesophagus on the other. The throat has three parts 1. the larynx, popularly known as the wrong throat, 2. the epiglottis, and 3. the uvula. (To the Dutch terms he adds Larynx, Epiglottis, and Columella.)

[ In present-day Dutch the larynx is still popularly referred to as 'the wrong throat', when food or drink enters it.

The Greeks called the uvula *κίων καὶ γαργασίων*, which terms were translated into Latin as *Columna* and *Gurgulio* (Rufus Ephesius, *De partibus hominis*, p. 28). *σταφυλή* (grape) is the word used by Aristotle (*Hist. Anim*, Bk.I, C.11, 493 A 3) for an inflamed and swollen condition of the uvula. ('Uvam (σταφυλήν) non partem, sed affectum (πάθημα) nominari oportet', Rufus Ephesius, *ibid.*) Vesalius used *Columella*, translating the Greek diminutive *κιονίς*. Celsus, (C. 30 A.D.), however, used *uva* (grape) for the uvula, whether healthy or inflamed (*De medicina*, Lib.VI, Cap. 14, *De uvae morbis*), and Vesling (1598 - 1649) has the diminutive *uvula* (*Syntagma anatomicum*, ed. Blasius, 1695, p. 274), which gave rise to French *luette* and Italian *ugola* (Hyrtl, pp.591 ff).

Panconcelli-Calzia (Leonardo, p. 145) points out that the form 'ugola' already occurs in Leonardo da Vinci's notebooks.

Fallopian (1523 - 1562) has γαργυρεών seu gurgulio, vua seu gurgulio, and columna seu vua (Opera Omnia, 1606, pp. 426 and 452), while Fabricius ab Aquapendente (De locutione, p. 27) has an even greater selection: Caruncula rotunda velut processus ab extremo palato in medio tonsillarum dependens, Columella, Kion, Gargareon, Staphylophoron, et Vua dicta.

Alsted's 'Uvula, sive plectrum, quod est caruncula' reflects the old Galenic belief that the uvula was the plectrum of the voice, i.e. that it played an important part in voice production.

('Gurgulio (γαργυρεών) ad vocis magnitudinem et elegantiam facit', Oribasii Anatomica ex Galeno, p. 67, quoted by Hyrtl, p. 593. Cf. Fabricius ab Aquapendente, De larynge, p.41.)]

The mouth is the forming-matter situated between the front of the throat and the outer part of the lips. It may be divided into an inner mouth and an outer mouth.

The inner mouth lies between the front of the throat and the teeth. It consists of two sections, 1. a containing part, and 2. a contained part.

[ Alsted, partes continentales et contentae (pp. 753, 757, 758), and cf. Os dividitur in partes constituentes et contentas (p. 760).]

The containing parts of the inner mouth surround the inner-mouth cavity and contained part. They can be divided into an upper half and a lower half. The upper half or upper mouth stretches vault-wise from the front of the throat to the ends

of the upper teeth, and consists of

1. the root of the upper mouth or roof
2. the inner middle
3. the middle
4. the outer middle or toothflesh (= gums)
5. the toothbone or bare teeth.

(p. 11) Nos 1, 2, and 3 together make up the roof of the mouth, and Nos 4 and 5, taken together, the teeth.

The partition into five corresponds to the partition of day into 1. dawn, 2. forenoon, 3. noon, 4. afternoon, 5. evening.

The containing lower half of the inner mouth, which may be called the lower mouth, reaches from the ground of the tongue and the string of the tongue to the ends of the lower teeth.

The lower mouth has two main parts, 1. a ground (or floor), 2. lower teeth.

The ground of the lower mouth is its lowest part, reaching from the ground of the tongue to the roots of the lower teeth.

The lower mouth is divided into

1. the root
2. the inner middle
3. the middle
4. the outer middle
5. the end (= front)

The contained part of the inner mouth is the tongue, a well-known part of the body, which consists of 1. an upper surface, and a lower surface, 2. a right-hand side, and a left-hand side.

The upper surface of the tongue may be divided longitudinally into five parts, which correspond to those of the upper mouth. They are

1. the root of the tongue
2. the inner middle
3. the middle
4. the outer middle
5. the tip or point <sup>3)</sup>

The part of the mouth in front of the teeth is called the outer mouth.

(p. 12) The principal parts of the outer mouth are the lips and the cheeks. There are two lips 1. an upper lip, 2. a lower lip. Each of them has two parts 1. a blade, 2. an edge or corner. The lips are connected at the ends by the corners.

The nose is that part which reaches upwards from the uvula to the ends of the nostrils.

(Chap. V, p. 13) Out of the matter mentioned above the forming-muscles make various kinds of forms or forming-vessels. These forms have two parts, 1. an upper vessel, and 2. a lower vessel. The upper vessel reaches from the throat above the upper mouth to the outlet of the nose. This may also be called the nose-vessel. Longitudinally it can be divided into 1. a posterior part, which reaches from the uvula to the beginning of the nostrils (this might be called the nose-pipe), and 2. an anterior part, which is divided by the septum, and is called nostrils.

The nose-vessel is bounded on one side by the ends of the nostrils, which can be widened and narrowed by the wings of the nose, and

on the other by the nose-door, which lies above the throat, is attached to the uvula, and can close and open the nose-pipe completely.

Great use is made of the nose-door in speech and it causes various differences in the voice.<sup>4)</sup>

The lower vessel of the forms is the part contained between the throat and the lips. The lower vessel can be divided vertically into 1. an arch, i.e. the upper part of the lower vessel, and 2. a floor.

The upper part of the lower vessel consists of the arches of 1. the throat 2. the inner mouth, and 3. the outer mouth or lips.

(p. 14) The arch of the inner mouth, reaching from the uvula to the ends of the upper teeth, is immovable and keeps its shape in all forms.

[ In spite of what he says on the preceding page, Montanus seems to look upon the uvula as the only movable part of the palate. Wallis and Holder also talk about velic action in terms of the uvula only.

Ten Kate, in a footnote to p. 145 of his 'Aenleiding' I, 1723, says that he first heard about the action of the soft palate in 1721. His informant was Dr. Sermes, 'an accurate anatomist'. It may be noticed that Montanus, unlike e.g. Madsen, Wilkins, Holder, Cooper and Amman, makes no overall distinction between 'mobile and fixed', or active and passive, organs.]

The floor is the entire lower part of the lower vessel. The floor can assume a great many shapes as a result of the various movements of the tongue. Horizontally the lower vessel can be divided

into 1. a pipe, and 2. a box.

The pipe is that part of the form which is behind the dividing-door (i.e. the place of articulation, see below), i.e., which reaches from the throat to the dividing-door.

The box is that part of the form which reaches from the dividing-door to the lips.

The pipe and the box are very variable in length and width. In proportion as the pipe is longer, the box is shorter, and vice versa. Sometimes the entire lower vessel is a pipe (viz. when the dividing-door is at the lips). Sometimes it is a box (viz. when the dividing-door is in the throat).

The pipe may at times be as wide as, or wider than, the box, e.g. in choking and splitting forms (see below). In forms with a completely closed dividing-door the box is empty and performs no action.

The lower vessel contains places in which the breath has a voluntary force imposed on it. These places are of two kinds, 1. voice-making, and 2. voice-changing.

It is in the voice-making places that the breath receives the internal form or essence of the voice. These I call voice-holes. (p. 15) A voice-hole is a place where the breathing-muscles impose a transient force, which is the sounding (i.e. audible) form, on the breath by forcing it (sc. the breath) through that hole. The voice-holes may be compared to the mouth-hole (lit. head) of a German flute, where the sound receives its essence, when air is forced through it. The sound may be a musical sound or noise. The latter occurs when the flute is dry or otherwise obstructed.

A voice-hole is either a sounding-hole or a rustling-hole.

A sounding-hole, or sound-hole, is a voice-hole in which the breath receives the internal form of the sound through a smooth passage of the breath, or, to put it differently: a sounding-hole is a place where the breathing-muscles impose a transient force or audible form on the breath by forcing or pulling the breath smoothly through it.

There can only be one sounding-hole in a form, and it is always in the same place, viz. in the throat.

A rustling-hole is a voice-hole in which the breath receives a transient force or the internal form of the sound as a result of an impeded passage through that hole. There can only be one rustling-hole in a form, but some forms have both a sounding-hole and a rustling-hole. A rustling-hole can be in any part of the lower vessel.

[In other words, Montanus' 'sounding-hole' is the place where voice in the modern phonetic sense is produced. He locates it correctly in the throat, i.e. the larynx. That voice is produced in the larynx was known to many of Montanus' predecessors (see the historical notes at the end of this chapter).

A 'rustling-hole' is a place where noise or friction is produced, i.e. the place of articulation in voiceless sounds and voiced fricatives.]

The voice-changing places bring about an additional change in the voice.

The principal voice-changer is the one which I call the dividing-door, because it divides the box from the pipe and

causes a marked and essential difference in sounds. Just as the voice-holes may be compared to the mouth-hole of a German flute, the dividing-door is like the top hole in such a flute, which is not stopped by the fingers, and which causes the most (p. 16) important change in the sound which has received its internal form in the mouth-hole. It also divides the flute into two parts, i.e. a stopped part, which is like the pipe of the form, and an open part, which is like the box. 5)

Just as the box and pipe undergo many changes through lengthening, shortening, widening and narrowing, the dividing-door may vary a great deal in depth and width.

The dividing-door can be in any place of the lower vessel, including the lips and the throat. In all these places the door can be widened and narrowed, as well as closed and opened.

The dividing-door is sometimes identical with the sounding-hole. Informs with a rustling-hole the door is always identical with the rustling-hole.

The less principal voice-changers cause an accidental change in the shape of the voice. There are two, 1. the lip-door, 2. the tooth-door. The lip-door causes a considerable, but accidental change in the voice.

An accidental change is the occurrence of a shape in a voice which does not make that voice into another letter. The letter remains the same, whether the accidental shape is added to it or removed from it. An essential change, on the other hand, is the occurrence of a shape in a voice which makes it into another letter.

The lip-door is sometimes identical with the dividing-door, in which case there is an essential change, but not in respect of its being the lip-door, but in its function of dividing-door. Moreover, it is sometimes identical with the rustling-hole (see above), but never with the sounding-hole. The lip-door can perform three pairs of actions:

1. opening and closing, 2. contracting and expanding,
3. protruding and drawing in.

These actions bring about a variety of shapes in the lip-door. The tooth-door is situated between the ends of the upper and lower teeth. It does not cause an important accidental change in the voice.

(p. 17) Its actions are 1. opening and closing, 2. moving forwards and backwards. These actions are caused by the muscles of the lower jaw-bone.

The shapes of the lip-door and of the tooth-door resulting from these actions can be divided into 1. openness, 2. contraction, and 3. protrusion of the lip-door, and 1. openness, and 2, shifting of the tooth-door.

The same number of degrees could be distinguished in contraction and the other shapes; but it will be sufficient to distinguish two degrees of contraction, viz. moderate contraction, associated with the moderately hollow forms, and very close contraction, which is found in the hollow forms. (On hollow forms, etc. see below, Chapter V.)

VOICE

That voice is produced in the larynx has been known in the West, at least to some people, since Aristotelian times. Aristotle (Hist. Anim. iv, 9, 535 A) states that vowels are produced by the voice and larynx, consonants by the tongue and lips. In 'De Anima' ii, 8, 420 B 29, however, he says that voice is the striking of outgoing air against the trachea. Moreover, Aristotle and the Greeks generally, often interchanged the terms 'larynx' and 'pharynx'. In Hist. Anim. 493 A 6 and 535 A 32 the upper part of the windpipe is called 'larynx', in Hist. Anim. 535 A 29 it is referred to as 'pharynx'. Galen usually distinguishes between the two, but sometimes he, too, confuses them (cf. Hyrtl, p. 293: *caput asperae arteriae, quam etiam pharyngem appellamus* ('De placitis Hippocratis et Platonis', Lib. ii)). This confusion is pointed out by Fabricius ab Aquapendente in 'De larynge', i, 1, and 'De locutione', 12 f. He insists on the distinction between 'pharynx = fauces', and 'larynx = guttur' ('De locutione', 12). In medieval times 'epiglottis' or 'epiglotum' was often used instead of 'larynx' (e.g. Mondino, 1315), hence Leonardo da Vinci's use of 'epigloto' (by the side of 'trachea') for 'larynx'. (See Panconcelli-Calzia, Leonardo, p. 116). What it was in the larynx that produced voice was apparently not realized till the beginning of the eighteenth century, when the action of the vocal folds came to be studied by Dodart and Ferrein.

Until then the position in the West seems to have been like that in Ancient India. The glottis was known, but the vocal folds were not (cf. W.S. Allen, *Phonetics in Ancient India*, p. 33).

Galen (Claudius Galenus, second century A.D.), the greatest authority on matters medical, anatomical, and physiological down to the time of Vesalius, was convinced, like Aristotle, that the larynx was the instrument of the voice: 'The breath beaten by the cartilages of the larynx becomes voice' (*De placit. Hipp. et Pl.*, Lib. II). He described the structure of the larynx elaborately and discovered the ventricles of Morgagni ('*De usu partium*', VII, C. 13. Morgagni pointed out in 1714 that Galen knew them).

In '*De usu partium*' no name is given to the cricoid cartilage; Galen simply refers to it as the δεύτερος χόνδρος. The term χόνδρος κρικοειδής occurs in the (probably spurious) '*Tractatus de vocis organo*'.

Vesalius refers to it as 'secunda laryngis cartilago, quae perfectum circulum conficit', while Fallopius (1523 - 1562) and others call it 'Cartilago innominata'.

Fabricius ab Aquapendente in '*De larynge*', Cap. 5, uses the term 'Crycoidea' or 'Crecoidea' (see Hyrtl, p. 163).

Galen recognized only one arytenoid. ('Αρυταινοειδής means 'like a pitcher', these two cartilages suggesting to Galen the shape of the lip of a pitcher). Early in the sixteenth century Berengario discovered that there were two, though the Arabs must have known this before him (see Hyrtl, p. 57).

Galen makes interesting remarks on the innervation of the larynx and the tongue and on the organs of speech (τὰ φωνητικὰ ὄργανα) generally. He shows a much better understanding of the relations between breathing and speech than Aristotle (see Panconcelli-Calzia, Leonardo, pp. 87 ff).

The entire inner cavity of the larynx was referred to by the Greeks as γλωττίς, which is a diminutive of Att. γλῶττα or tongue (γλῶσσα). It was called thus because it resembles the mouth-piece of an aulos (Lat. tibia), a double-reed instrument like the modern oboe and unlike the modern flute, which has only a mouth-hole and not a mouth-piece. (Galen, 'De usu partium', VII, C. 13, γλωττίς = γλῶσσα λάρυγγος). The Latin translators of Galen and Oribasius render γλωττίς by 'lingua' or 'lingula laryngis' (cf. Oribasii, Anatomica ex Galeno, p. 61: in spatio laryngis interni, corpus positum est, linguae fistulae alicujus (γλώττη) simile).

This corpus extends 'ab orificio, quod a finibus cartilaginis arytaenoideae et thyreoideae efficitur, ad connexionem laryngis cum trachea.' (Hyrtl, p. 244).

Leonardo da Vinci uses 'fistula' and 'fistola' for glottis in the modern sense (Panconcelli-Calzia, Leonardo, p. 116).

Vesalius, who objected to Greek terms in anatomy, replaced γλωττίς by 'rima laryngis', apparently forgetting that 'larynx' is Greek.

This is the term used by Fallopius (see 'Institutiones Anatomicae, Opera Omnia, Francofurti, 1606, p. 452).

Fabricius ab Aquapendente uses a number of terms, incl. glottis, rimula, lingula, ligula, exigua lingua, lingua parva, for 'glottis' in the modern sense. Cf. 'De brutorum loquela', p. 2, in the 1625 ed.

and 'De larynge', Cap. II, De glottide et ventriculis, p.2: Glottis = Lat. lingula (= parua lingua) similis est linguae alicuius fistulae (inquit Galenus) ob quam similitudinem ita est appellata. Similitudo autem in duobus spectatur, figura et vsu ... Glottis = lingula, et glotta = lingua laryngis (Galenus), quod foramen, seu rimam in larynge constituit.

Ibid. p.3: glottis = lingula; foramen verò ab ipso constitutum, rima seu fissura. On p.36 he states that 'rimulae angustia' is the prime, proximate and immediate cause of the voice: 'rimulae actio est in genere motus, in specie dilatatio, compressioque, qui motus naturalis non est, ... sed motus est voluntarius à dearticulatione arytaenoidis, et musculis ipsam mouentibus proueniens. (Ibid. p.35).

The air passing through the narrowd glottis is rendered vocal and sonorous (p. 36 f). It is clear from his descriptions and drawings that Fabricius is using the word 'glottis' in the modern, restricted sense, but unlike Hyrtl (p. 245) and Panconcelli-Calzia (Arist., pp. 60 f and Geschichtszahlen, p. 16) I have not been able to find any specific mention of the two ligaments (vocal 'cords') in his works.

Like Galen and Fallopius (Inst., pp. 452 f) he only talks about muscles by which the glottis can be widened and narrowed, opened and closed.

Wallis (1653 and later editions) only mentions the glottis in the passage where he says that whether 'vocis Tonus' is more 'gravis' or 'acutus' depends on the degree of openness of 'laryngis rimula' and on the length and width of the trachea.

In his discussion of the difference between whisper and 'open speech' he mentions vibration of the larynx and trachea <sup>6)</sup>:  
 Nam, si inter loquendum tremula fiat Laryngis et Trachaeae concussio, (nempe propter tensionem,) fit aperta Loquela; Sin minus, fit Susurrus, laxiori nempe trachaea et minus tensa. He adds that all letters can have this concussion, except the mutes p, t, k and their aspiratae. The vocal folds are not mentioned. Nor are they in the celebrated passage in Holder's 'Elements' (p. 23): 'The larynx both gives passage to the Breath, and also, as often as we please, by the force of Muscles, to bear the sides of the Larynx stiffe and near together, as the Breath passeth through the Rimula, makes a vibration of those Cartilaginous Bodies which forms that Breath, into a Vocal sound or voice, which by the Palate, as a Chelis or shell of a Lute, is sweetened and augmented.'

Amman (1692 and 1700) says that voice is a tremulous motion not only of the larynx, but also of the skull and of all the bones in the body. It can be felt by putting the hands on the throat, the top of the head and the back ('Dissertatio de Loquela', 1700). Narrowing of 'laryngis rima' makes 'spiritus simplex non sonorus' into 'spiritus sonorus seu vox'. He compares the production of voice in the larynx to the production of tone in a flute, or rather, tibia. The five cartilages of the larynx are connected by muscles and nerves. The nerves cause the muscles to act on the cartilages, which by resisting this action are set vibrating. This vibration is communicated to the air, and is comparable to the vibration of the tongue in the production of r or of the lips in a labial trill. The bigger the cartilages, the slower the vibrations

and the lower the tone. In one and the same speaker variations in pitch depend on the degree of aperture of the glottis. Cf. Boerhaave's account (in *Opera Omnia Medica*, Venetiis, 1742, pp. 79 ff) based on Casserio's 'De vocis, auditusque, organis,' Ferrariae, 1600, and Morgagni's 'Adversaria anatomica', 1706, 1717, 1719: ... (aer) ... in glottidem, ubi arctata via celerius motus, elastico tremulo corpori illisus, hinc in undas reciprocas percussus, sonum facit: docent Physici.

...nexu suo rimam formantia, aperire, vel arctare, valeant rimam hanc innumerabilibus modis, prout muscoli hic positi variè agunt; hinc diversitas vocis quoad acutiem vel gravitatem habetur;...

Lambert ten Kate, who in 1699 still thought that voice was produced by compression of the breath between the epiglottis and the 'mouth of the windpipe' (*Verhandeling over de Klankkunde*, Van der Hoeven, pp. 68 and 106; cf. Wilkins, 1668, p. 380: the motion of the epiglottis by which sound is made), states in 'Aenleiding' I, p. 141, that the principal tools of the voice are <sup>the two</sup> cartilaginous inner lips at the top of the larynx below the epiglottis, which, when brought close together, make a narrow slit like that of the reed (he means 'like that between the two reeds') of an oboe.' 'Aenleiding' I was published in 1723, but apparently written between 1711 and 1714 (Van der Hoeven, p. 9), by which time Ten Kate was probably familiar with Dodart's work on the 'lèvres de la glotte' (*Mémoires sur les causes de la voix*, etc., *Mémoires de l'Académie Royale des Sciences de Paris*, 1700, 1706, 1707).

The term 'chordae vocalis' was coined by Ferrein ( De la formation de la voix de l'homme, Mém. de l'Acad., 1741, p.409), who compared the vocal lips, as he at first called them, to the strings of a violin on which the breath acted like a bow. (Cf. Hyrtl, p. 110, Panconcelli-Calzia, Arist., p. 13).

Ferrein was the first to publish the results of experiments carried out on larynges taken from human and animal corpses. Leonardo da Vinci's similar experiments on the necks of swans and geese were not published till much later (see Panconcelli-Calzia, Leonardo, p. 111).

The difference between voiced and voiceless stops was noticed long before anything was known about the action of the vocal folds. A recognition of it is implicit in the Greek classification of  $\kappa$ ,  $\tau$ ,  $\chi$ , as  $\psi\iota\lambda\acute{\alpha}$ , and  $\beta$ ,  $\delta$ ,  $\gamma$  as  $\mu\acute{\epsilon}\sigma\alpha$ .

Terentianus Maurus and Marius Victorinus distinguish between the voiced stops and the corresponding voiceless ones in terms of slight differences in place and/or manner of articulation (see Sturtevant, pp. 164 f and 170 f), and many of their disciples in the early modern period describe the pronunciation of [g], [d] and [b] as 'obtusior', 'crassior', 'lenior', 'levior' or 'mollior' than that of [k], [t] and [p], while Wallis believes that [g], [d], [b] and their 'aspiratae' are nasalized. On the other hand Hart not only notices that in [d] the teeth 'are touched with the toung more softli then in the t', he pairs all the stops and fricatives correctly as 'males and females', or 'bretheren and sisters', according as they have the 'inward manli voice' or are 'brēōd' (see 'The opening', 1551; 'An Orthographie', 1569; 'A Methode', 1570; ed. Danielsson,

pp. 128, 136 ff, 194, 213, 245 f).

Robinson (ed. Dobson, pp. 13 f) knows about the 'vitall sound bredde in the throat', without which 'all the other parts of the voice would be but as a soft whispering'.

Lodwick and Newton also pair voiced and voiceless consonants correctly. Wilkins and Holder even distinguish between voiced and voiceless nasals and liquids.

It is not really fair to say, as W.S. Allen does (India, p.37), that 'Only in the latter part of the nineteenth century, under the influence of Indian teaching, does the recognition of the voicing process make headway'.

Notes to Chapter IV

1) A conventional, but apposite comparison (cf. Wallis, Holder, Cooper, and many others).

2) Compare the similar distinctions made by Holder, 1669, and Amman, 1700, between the organs producing the 'matter', and those responsible for the 'form' of speech.

Cf. D. Abercrombie's distinction between the respiratory, phonatory, and articulatory systems (Elements of General Phonetic, I, 2).

3) Cf. Madsen's *mucro*, *extrema*, *media*, *dorsum lingvæ*, and *interior lingva*;

Fabricius ab Aquapendente's *apex*, *medietas*, *caput* (s. *radix*), *latera*, and *ceruix linguae* (De Locutione, p. 27).

4) Madsen, 1586, mentions the nose among the organs of speech, but does not really understand its function in speech (see De Literis, pp. 11, 33, 45, 88).

5) Cf. Madsen, De Literis I, pp. 10, 12, 19 and 32, where the mouth is compared to a 'fistula', and the articulation of consonants to the stopping of the holes of a 'fistula' with the fingers. Similarly Fabricius ab Aquapendente, De Locutione, p. 3.

6) Cf. the reference to 'De Anima' ii, 8, above, and see Ps.-Arist., 'De Audibilibus'.

Cf. Cooper, 1685, p. 2; 1687, pp. 2 f. According to Stevenson and Guthrie, p. 81, Claude Perrault (1613 - 1688) showed that the trachea plays no part in the production of voice.

CHAPTER VDIVISIONS OF FORMS AND SINGLE LETTERS

On pp. 18 ff of Book I Montanus discusses the 'divisiones in genere et specie' of the forms brought about by the forming apparatus (see above, Chapter IV). The divisions of the forms give rise to divisions of the 'single letters' produced with the help of the forms.<sup>1)</sup> (Bk II, pp. 31 ff.)

As these two sections cover much the same ground, the material in them has been telescoped in the present treatise, and will be dealt with after an account has been given of Montanus' definition of, and further remarks on, the 'single letters' in the intervening section (Bk II, pp. 27 ff).

It should be understood that the 'forms' referred to in this section include type of stricture, place of stricture, breath/voice, and shape and height of the tongue.

(Bk II, p. 27) A speech-letter, as distinct from a marking-letter (i.e. symbol), is speech which contains a letter-ground. Montanus adds that for the sake of brevity he often refers to speech-letters as 'letters'. They might also be called word slices,<sup>2)</sup> because they are the nearest matter but one of the words, and smaller than the word members, just as the sentence slices are the nearest matter but one of the sentences, and smaller than the sentence members.

(p.28) Speech-letters are single or double. A single letter contains only one letter-ground or, to put it differently, a single letter is one which cannot be divided or analysed into many. A double (=multiple) letter is one which can.

A single letter has three parts, viz. a ground, a front-cleaver, and a back-cleaver. These three parts belong to two species: 1) principal parts (=grounds), 2) less principal parts (=cleavers).

The letter-ground is the principal part of the letter, with which its form is inseparably connected. A letter cannot exist without a ground. The ground is formed with the form of the letter, in so far as it is permanent. The ground by itself without any cleavers is a letter. The ground has the highest sound in the letter, whether in deed or ( as in those trying to rustle, viz. k, t, p ) in intention.

The cleavers are the less principal parts cleaving to the ground. They are caused by a change of the forms, or by the forms in changing, while breathing continues. Cleavers cannot by themselves be letters. They are either front-cleavers or back-cleavers.

The reader should pay attention to the sound heard in pronouncing -sp in 'gesp', both between the s and the p, and at the end of the p. Noise is heard in the s, while the lips are open and do not move, which is the ground of the s. Then he will notice another noise, following the first and differing from it. This is caused by the closing of the lips. Its beginning is the back-cleaver of s, and its end is the front-cleaver of p. After this a silence can be heard and an attempt to rustle, which is the ground of p and lasts as long as the lips remain closed. (p.29) Finally, when the lips are opened,

a puff may be heard, which is the back-cleaver of *p* and which receives its essence in the opening of this closed form by the breath which bursts out.

After this demonstration of the existence of 'cleavers', which correspond, of course, to A.J. Ellis's 'glides' (first mentioned by Ellis in 1854; see *On Early English Pronunciation I*, 1869, p. 59, fn. 3), Montanus continues:

Those who claim to have understood the nature of letters best and to have described them most accurately, like Petrus Ramus, Petrus Martinus, Alstedius,<sup>3)</sup> and many others, declare them to be *Sonos in Syllabis individuos, Partes in dictionibus indivisibiles, Partes minimas Dictionum Prolatarum, Partes vocum quibus soni individui exprimuntur*. Though the opinion of so many excellent and learned men should carry much weight, experience and the truth of things have taught me otherwise. I appeal not only to experience, though my readers can share it with me after making the experiment mentioned above, but also to the following arguments:

1. Hebrew has a *Sceva Mobile*, which is considered to be neither a vowel nor a consonant, and hence not a letter. All letters are supposed to be included among one or the other of those two species. But it is something. It is modestly heard in speaking. If *Sceva* is not a letter, it must be part of a letter. And if speech contains an audible sound which is not a letter, a letter cannot be the smallest or indivisible sound.

2. Letters of different forms pronounced in the same syllable have a continuous and uninterrupted sound, if there are no rustle-attempters among them, and each letter also has its permanent form, according to which it is described and through which it receives its distinct essence. There cannot be distinct forms and continuous sound without (p.30) an additional sound being spoken outside the permanent forms in changing from one form to another. Otherwise the sounds of the letters could not be joined together. This sound must be different from that which receives its essence in the permanent forms, since the form is different, and the sound follows the form in its shape.

3. Rustle-attempters consist of an attempt to rustle and actual rustle; this also shows that letters are divisible (see the third division of the single letters, M.p. 37; below, 5.3).

[ The Hebrew grammarians of the sixteenth and seventeenth centuries (e.g. Martinus, Keckermann, Wasers, Buxtorf) describe *shewa mobile* as 'not really a letter, *vocalis impropria, nihil aliud quam vinculum syllabæ, e brevissimum, raptissime et quasi furtim pronunciatum*'. Most of them compare it with the vowel in the German prefixes *be-*, *ge-* ( '*valet e brevissimum, quale in Bezahlt, Gestrafft quod rapidè effertur, quasi Bzahlt, Gstrafft*', Buxtorf, 1673, p.7). 'It is to the ears what lighting is to the eyes'(Alsted, 281). Wilkins, 365f, equates it with the vowel in 'but, full' (= [ɜ]?).

Cf. W. Chomsky, David Kimhi's Hebrew Grammar, p.35: The pronunciation of the '*shewa mobile*' is still a moot question.]

## 5.1

The first Divisio in genere of the forms and of the single letters (M.pp. 18 f and 31 ff) is made according to the shape of the dividing-door.

These forms have either an open or a closed door. In the open-door forms the door may be wide open, so that the passage (of the breath) is not impeded in any way (free forms), or it may be partly closed, so that the passage of the breath is slightly impeded, giving hindering forms, which may be either trilling or splitting. In the letters formed with an open-door form the main sound leaves at the mouth. Free letters, i.e. those formed with free forms, are the easiest to pronounce and the most usual, perfect and clear. Examples are a, e, i, o, u, h, s, f, g, z, v, (i.e. vowels and fricatives).

Hindering forms give rise to hindered letters, which are difficult to pronounce. In the trilling forms, with which trilled letters are produced, the breath in its attempt to overcome the obstacle causes it to trill, as in r, especially the type in which the vibrating obstacle is the tip of the tongue; the tip closes the dividing-door above (at the teeth) somewhat, but not completely. The door may be said to be ajar. The trilled letters are the most difficult to pronounce, and a person whose tongue is incapable of trilling cannot learn to pronounce them properly and will often produce split letters instead.

In the splitting forms the dividing-door is closed in the middle by pressing the tongue against the arch (see above, Chapter IV; M. Bk I, p. 14), but on either side of the tongue there is an opening, so that the air-stream is split into two. Such is the form with which *l* is produced (Bk I, pp. 18 f). In a split letter the main sound leaves the mouth on both sides of the tongue, but some of its sound goes out through the open nose-door and the nose (Bk II, p. 31). In *l* the tip of the tongue closes the dividing-door above (at the teeth), but the sides of the tongue are pressed down and leave an opening on both sides, so that the sounding breath, finding the dividing-door closed at the top, makes its escape on both sides and thus assumes a split figure and at the same time a hollow shape, which is the result of depression of the middle of the tongue (Bk II, p. 32). (Cf. Montanus' statement on p. 30, quoted above, that 'the sound follows the form in its shape'.)

[ Montanus, like Robinson (1617) and Bonet (1620) before him, and Newton, Wilkins, Cooper and Amman after him, describes a bilateral [l]. De Heuiter (1581, p. 51) and Van Helmont only recognize unilateral [l]. Wallia and Holder point out that [l] can be either unilateral or bilateral.

In the last quotation from Montanus the tongue-position described suggests dark [l], which is rather surprising, since in this passage a number of sounds are compared which all have a flat shape of the tongue (see below, 5.4). Montanus notices the inconsistency himself, and talks of a 'flat-hollow' shape for [l] in the group [il].

On clear, (medium) and dark [l] in Latin as distinguished by Consentius and Priscian (on the authority of Pliny), see Sturtevant, pp. 148 f. Ramus in his *Grammatica Latina* (Lib.I, Cap.I) obviously follows Priscian in distinguishing three types of [l], and is taken to task by Madsen (*De Lit. I, p. 34*) for doing so.]

(Bk I, p. 19) The closed-door forms have a closed dividing-door. In them the nose-door is either open or closed. Nose-forms are those with an open nose-door, e.g. the forms with which m and n are produced. Those with a closed nose-door may be called choking forms, because in them the breath is choked between the closed dividing-door and the closed nose-door (e.g. the forms of b and d ).

The closure of the dividing-door is easily noticeable, but it is more difficult to feel whether the nose-door is open or closed. To find out about this one should pronounce a choked letter and a nose-letter in rapid succession and pay careful attention to the movement at the uvula. If one pronounces b and m, one will notice that in both the dividing-door at the lips is closed, but in b there is closure at the uvula, whereas in m there is an opening.

(Bk II, p.31) In the letters formed with a closed-door-form the sound does not leave at the mouth.

Nose-letters are ng, nj, n, m. As in them the dividing-door is closed and the nose-door is open, the sound leaves through the nose only.

(p. 32) In n the tip of the tongue closes the dividing-door at the teeth completely, but the nose-door is open, so that the sounding breath leaves entirely through the nose, and through the nose only.

Choked letters are γ (= [g]), d, b, k, t, p. Their forms, which are closed both at the dividing-door and at the nose-door, choke the sounds which the breath produces in them (i.e. the forms) or tries to produce in them, so that they find no exit and are dull and dumb.

Montanus asks the reader to pronounce and compare 'ir, il, in, id'. All the letters in these groups are 'sounders' and they are all tooth-letters. The reader should make them all with a flat shape of the tongue (see below, 5.4). Their only difference will then be found to be in the shape of the dividing-door, which gives rise to free, trilled, split, nose, and choked letters, respectively. The reader should also pay attention to the shape and movement of the mouth, and especially to the position of the tongue-tip at (i.e. near or against) the teeth. In d (in 'id') the tip of the tongue closes the dividing-door completely at the teeth, and the nose-door, which is near the uvula, is shut by pulling up the uvula, so that the space at the back near the throat is larger than usual. The sounding breath, finding the nose-door and the dividing-door completely closed, makes an abortive effort to find a way out, and is stifled inside. As the space near the throat is larger than usual, the sounding breath is most clearly heard there.

[ No general statement is made by Montanus about the state of the 'nose-door' in 'free' letters (i.e. those pronounced with an 'open dividing-door', viz. vowels and fricatives) and trilled letters. On p. 32 [i] (in 'ir, il, in, id') is said to be pronounced with a free passage of the breath 'everywhere, and especially in the nose-door and the dividing-door'. Whether this is meant to apply to all vowels (and fricatives) is not clear. He expressly mentions (slight) nasalization of [l] on p. 31.]

## 5.2

The second Divisio in genere of the forms (Bk I, pp. 19 f) is according to place or depth of the dividing-door.

These forms are 1. of the throat, 2. of the inner mouth, 3. of the outer mouth or lips.<sup>4)</sup>

(p. 20) The throat forms have no pipe, since the dividing-door is in the throat, and therefore the voice-hole and the dividing-door are one. The inner-mouth forms all have a box and a pipe. In them the sounding-hole and the dividing-door ~~never~~ coalesce, but the rustling-hole and the door always do. Inner-mouth forms are either roof forms or tooth forms. The roof forms are root, inner-middle, or middle forms. Tooth forms have their dividing-door at the upper teeth. They are either 1. toothflesh (i.e. alveolar) or outer-middle forms, or 2. toothbone (i.e. dental) forms. ( Note that 'outer middle' refers to the palate as well as to the tongue, and that toothbone forms involve the upper toothbone and the tip of the tongue.)

Lip or outer-mouth forms have no box.

The second Divisio in genere of the single letters (Bk II, pp. 33 f) , which is made on the basis of the above division of the forms, is followed by a critical examination of the classificatory categories of the Hebrew grammarians.

(p. 34) It is customary among the Hebrews to divide the letters which are called consonants into five genera according to certain speech-tools (i.e. organs of speech), viz. into letters of 1.the throat, 2.the tongue, 3.the palate, 4. the teeth, 5. the lips. This is an imperfect division, though it shows an inkling of the true knowledge of the letters.

The objections that may be raised against it are:

1. Only the consonants are so divided. There is some excuse for not including the vowels, however, because the Hebrews do not usually indicate the vowels by adequate symbols.
2. One of these five differences is taken from the tongue, and under it are arranged such letters as are included among other species or genera, viz. among the tooth letters.
3. They have no more than this one Divisio in genere, as if it were by itself adequate to express the nature of the letters.
4. Their five divisions do not include all the genera of the letters which exist in nature.
5. They have only two places between the throat and the lips, apart from that of the tongue, which is vain and superfluous.

[ The Hebrew division of the consonants into gutturals, palatals, linguals, dentals and labials seems to make its first appearance in the Sefer Yesira, or Book of the Creation, which has been

assigned to dates ranging from the second century B.C. to the sixth A.D. (see *The Jewish Encyclopedia* and *Jüdisches Lexikon*). It occurs with minor variations in the early (tenth-century) grammars of Hebrew written in Arabic, and the later handbooks written in Hebrew (see Chomsky's edition of David Kimḥi's *Mikhlol*, p. 11 and p. 30, Note 6), from which it passed into the sixteenth-century Hebrew grammars produced in the West. Reuchlin, 1506, pp. 5 and 7, mentions the lips, tongue, teeth, and palate as the places of articulation of the consonants, and lists the sounds produced in each place. As far as I can see, he does not, however, use the terms 'labiales', 'linguales', etc. He deals with the gutturals under the vowels (p. 7). Most of the later writers have the five classes of literae: gutturales, palatales or palatinae, linguales, dentales, and labiales, but Helvicus (Christoph Helwich) in his '*Elementale Hebraicum et Chaldaicum*,' Giessae, 1619, assigns yodh, qoph, gimel, and kaph to a sixth category, which he calls 'faucalae' (Cf. Alsted, *Encyclopaedia*, 280). Montanus was obviously not the first to notice that the traditional Hebrew classification is based on more than one fundamentum divisionis, the tongue, from which the linguals derive their name, being an active articulator. In actual fact many of the early writers guarded against cross-division by adding some such term as 'sibilant' to their definition of 'dental' (although resh is usually included among the dentals), and by defining 'linguals' as 'sounds produced by a stroke of the tongue against the upper teeth'.

(For earlier criticism of the Hebrew classification, see Sanctus Pagninus, *Hebraicarum institutionum Liber I, Cap. 13, 1526*; Theodorus Bibliander, *De communi ratione omnium literarum et linguarum commentarius*, Tiguri, 1548, pp. 152 f; Madsen, *De Literis*, 1586, II, pp. 155 ff.)

No classificatory terms denoting place of articulation seem to have been used in the West before Hebrew came to be studied intensively in the sixteenth century, although grouping of consonants according to place of articulation is found in Dionysius of Halicarnassus and in some of Dionysius Thrax's commentators.]

Montanus (p. 35) distinguishes seven places of articulation, viz. throat, root, inner middle, middle, toothflesh, toothbone, lips. As experience is the best teacher, the reader should pronounce and compare seven letters which agree in everything but depth of the dividing-door. Montanus gives a number of examples, including the series [a·], [a'·], [e·], [e'·], [i·], [i'·], [y·]. As one proceeds forwards from the throat, advancing the dividing-door or narrowing of the mouth through which the sound comes, the mouth gets narrower and narrower, and the sound, which is the same in all other respects, receives its difference in each of these seven places. This can be felt even more distinctly by putting a finger in the mouth. As rustling letters (i.e. voiceless fricatives) receive their essence and internal form at the dividing-door, seven rustlers differing in depth combined with the above vowels will show this even more clearly: [ha·], [a'·x], [e·x], [e'·x], [i·x], [i'·s], [y·f].

If one postulated more than seven degrees of depth, the resulting sounds would not have enough difference for them to be looked upon as distinct (i.e. separate) sounds. Even with seven places and species the difference in some is so slight that two of such letters are sometimes interchanged or considered one, as in the case of [ɛ]/[e] and [ɪ]/[i]. When these are single letters (i.e. when short), the difference is hardly noticeable, but when they are combined with the steady variety (i.e. when they are long), there is a marked difference.

The letters represented by ch and g, and some others, are really three or four different letters each according to the depth of the door, although they are considered to be one each.

It is possible and sometimes useful to operate with four instead of seven places. Seven are necessary for the free sounders (i.e. vowels), but for most of the other letters four places are usually sufficient. A regrouping of the seven genera will give the following four: letters of 1. the throat, 2. the roof (with three species and places), 3. the teeth (with two species and places), 4. the lips.

In the Appendix Montanus changes his mind twice about the number of places. (p. 159) Johannes Cloppenburgh<sup>5)</sup> has shown him how the Swiss use Hebrew 'Hcheth' and that there is an important difference between sounds produced with a dividing-door deep down in the throat, about the larynx itself, and sounds made with a door in the front of the throat, about the uvula.

He now considers it necessary to bring the number of degrees of depth up to eight by splitting up the category of throat letters into letters of the larynx and letters of the uvula. This increases the number of single letters considerably, since a whole new series is added, as is shown by the table on p. 160, which includes, among other things, a's and o's in the larynx as well as at the uvula and the root.

On p. 163 he declares that there are letters of 'intermediate depth', which may be assigned to either of the categories between which they fall. Thus there are letters intermediate in depth between larynx and uvula, uvula and root, root and inner middle, etc., but not between teeth and lips.

[It will have been noticed that in his enumerations of the places of articulation and in his arrangements of sounds according to place of articulation Montanus, like the ancient Indians, always proceeds from the throat forwards (cf. W.S. Allen, *Phonetics in Ancient India*, p. 48).

Montanus' 'finger in the mouth' is made much of by Guittart (*English Studies* IX, p. 2) and Christen Møller (*Acta Jutlandica* III,1, p. 65). In another passage (p. 15 Inl.) Montanus urges the reader to check all his descriptions of sounds not only by pronouncing them, listening carefully to them, and comparing them to hear their differences and resemblances,<sup>6)</sup>

but also by feeling the shape of the forms in the mouth with the finger.

He was, however, not the first digital experimentalist in the history of phonetics. As early as 1569 John Hart wrote: 'And holding the top of your finger betwixt your téeth, you shall the more sensiblye féele that they (i.e. the vowels a,e,i,o,u) are so made with your sayd instrumentes' (An Orthographie, ed. Danielsson, p. 190).

Another experiment is suggested by Madsen, 1586, p. 55: 'Et consonantes, qvia impetu qvodam proferuntur, magis et fortius qvam vocales spirant. Et praecipuè hae: S, R, T, D, C, F, B, P. Qvod deprehendi potest: Si qvis, dum eas profert, manum aut plumam aut lychnum ardentem proprius ori admoveat.'

Cf. Bonet, 1620, p. 68: '...mostraralo la experiencia poniendo la palma de la mano delante de la boca, y pronunciando la p.'

The four[x]'s (written ch by Montanus) in the combinations of vowels and 'rustlers' would certainly not be phonemically distinctive in Dutch.

As we shall see, Montanus does not assign the Semitic pharyngals to 'the place intermediate between the larynx and the uvula'. The rejected place 'intermediate between teeth and lips' might have helped him to analyse [f] and [v] as labio-dentals.]

(Bk I, p. 21) The third Divisio in genere of the forms is according to the voice-holes. These forms have either one voice-hole or two voice-holes. The former may be called one-voicing (eenstemmende), the latter two-voicing or rustling-sounding (tweestemmende of ruisclinkende). These names are taken from their work or deed (see above, 1.8). They should really have been called 'one-voice-holed' and 'two-voice-holed', but their work is more easily appreciated than their causes. (In other words these terms refer to auditory impression rather than organic formation.)

The forms with one voice-hole are either sounding or rustling. The sounding forms have a sounding-hole for their only voice-hole. With these forms a, e, i, o, u, r, l, n, m, d, b, and others are produced (i.e. all voiced sounds except the voiced fricatives.)

The rustling forms have a rustling-hole for their only voice-hole. These are the forms of h, when it consists of rustle only (i.e. voiceless [h]), ch, s, f, and also k, t, p, which differ from the above in that their rustling-hole is stopped, so that they cannot produce the deed of rustling, except before or after the stopping or closing.

The rustling-sounding forms have two voice-holes, viz. a sounding-hole and a rustling-hole. These are the forms of g, z, v (i.e. the voiced fricatives).

(Bk II, pp. 36 ff) The Divisio in genere of the single letters corresponding to the third division of the forms yields one-voiced and two-voiced, or rustling-sounding, letters. The one-voiced letters are either sounding letters (sounders<sup>7</sup>) for short) or rustling letters.

The sounding letters receive their internal form in the throat, and the external in the whole form. This property makes them quite different from the rustling letters and from whistling. The sounding letters have an unimpeded passage of the breath in or through the forms.

Among the rustling letters, which are produced with rustling forms, are included those which, properly speaking, do not rustle (i.e. make noise) in their grounds, as their dividing-door or rustling-hole is completely closed, so that the breath cannot even have an impeded passage (which would cause noise), and hence they are mute (e.g. k, t, p ).

Montanus includes them among the rustlers for the following reasons: 1. In these letters the breath makes an effort to rustle. To indicate their specific difference they may be referred to as 'sounds trying to rustle' or 'rustle attempters' (ruispoogende<sup>8</sup>). 2. When they are complete (i.e. consist of all their parts) or consist of two parts, they actually rustle in their cleavers or cleaver.

This can be heard. In p the silent ground is preceded by a slurping noise and followed by a puff. When two such letters come together at the end of a word, each of them can be heard. In -kt, -pt t could not be heard and distinguished from k or p, if it had no sound.

The rustling letters receive their essence and internal form in the door of their form, which in this respect is a rustling-hole, and their external form in the whole form. The action by which their internal form is produced is the rubbing of the breath against the door or rustling-hole.

The clear sound of the sounding letters is caused by a smooth, even and rapid flow of air through the sounding-hole, and all the force exerted in making them is passed on to the air outside the mouth.

In the rustling letters the passage of air meets with resistance in the rustling-hole, and is uneven. The force exerted is broken and only partially transferred to the outer air.

The difference in action which lies at the root of the audible difference can be felt, if one produces sound (i.e. voice) and rustling (i.e. noise) alternately. Whistling and blowing, both of which receive their essence at the lips, are analogous to sound and rustling, respectively.

A flute which has gone dry and stiff will often only produce a blowing noise, but when moistened, it will sound smooth and

clear, and the green reed-pipes, when dry, also lose their sound and are capable of rustling noise only. Similarly catarrh, or dryness of the throat causes hoarseness,<sup>9)</sup> but when the throat's stiffness has been removed by 'sweet moisture', it produces a clear sound.

The rustlers are not so easy to pronounce as the sounders.

The two elements of rustle-sounders each receive their essence in a special place of the form, the rustle in the rustling-hole, the sound in the sounding-hole, but they are simultaneous. The throat rustle-sounder (i.e. [ʁ]) is an exception to this rule; it has its rustling-hole and sounding-hole in the same place.

The rustle-sounders are double letters as regards the nature of their double sound, but single as regards time and their close union.

The division into the three genera of sounding, rustling, and rustling-sounding letters has no connection whatsoever with the well-known division of letters by the Greeks, Romans, and others, into vocales, semivocales et mutae (sounding, half-sounding and mute letters).

The reader should pronounce and compare fu, vu, si, zi, cho or och, go, etc. In u the force of the sound has its origin in the throat, and the breath receives a smooth and powerful passage

without any interruption (i.e. without rubbing against anything) in the throat and through the whole mouth, whose opening is wide enough, even between the lips, where the dividing-door is, to prevent rubbing. In *f* the throat performs no action at all, but the lips, where the dividing-door is, are narrowed and stiffened to resist the breath which is hitting against them. The breath in striking against the lips makes a noise, but there is no sound in the inner mouth or the throat. In *v* the action of the throat produces a sound and at the same time there is noise at the lips, but both the sound and the noise are more obscure than in *f* and *u*. Both the throat and the lips exert force and stay rigid, but not to the same extent as in *f* and *u*.

In the Appendix (p. 161) Montanus comes to the conclusion that rustle-sounding or voice-rustling tone (see above, p.70), (i.e. voice and noise combined) is not a specific difference, but an accident, which does not constitute species of letters. Nor is it restricted to *g*, *z*, and *v* (i.e. the voiced fricatives). It may also occur in *ch*, *s*, and *f* (i.e. the voiceless fricatives) without changing their species. On the other hand *g*, *z*, and *v* can also be pronounced as rustlers (i.e. without voice). Montanus now regrets that he has classed the voiced plosives as 'sounders' and the voiceless plosives as (abortive) 'rustlers', because he now believes that the true difference

between them does not lie in the sound/rustle opposition, but in broadness/narrowness, which are two shapes of the dividing-door. Forms as well as letters can be either broad or narrow. Broad letters are formed with a broad dividing-door, narrow letters with a narrow dividing-door. The former category includes the voiced fricatives and plosives, the latter the voiceless fricatives and plosives.

Narrowness has the inseparable concomitant properties of stiffness, firmness and tenseness, broadness those of laxness, looseness and spaciousness. Therefore, instead of the terms 'narrow' and 'broad' the terms 'stiff' and 'lax' might be used. As, moreover, for the production of narrow letters little breath is required and a narrow place on which force is exerted, and the reverse is true of the broad ones, they may be referred to as 'light' and 'heavy', respectively.

Montanus points out that he already used these terms, before he understood the true difference (see M. Bk II, Chap.XV, pp. 89f, Chap.XIX, p. 103; Bk III, Chap.V, p. 121).

Vowels, nasals, liquids, and h can also be either narrow or broad, according as they are combined 'in the same part of a syllable' with narrow or broad letters, 'but also in other cases'.

From a remark on p. 161 and the table printed there one gathers that Montanus recognizes that nasals and liquids can

be either 'sounding' or 'rustling', but that he believes that vowels are always 'sounding'.

On p. 162 he proposes the following terminological changes:

As 'two-voiced' or 'rustling-sounding' is no longer looked upon as a specific difference, these terms should be replaced by 'broad-rustling', while 'rustling' letters should now be referred to as 'narrow-rustling'. The 'sounding chokers' should be called 'broad', the 'rustle attempters' 'narrow'. He rather surprisingly replaces 'one-voiced' by 'not-broad-rustling', which is presumably meant to include 'broad non-rustling' for 'sounding', and 'narrow-rustling' for 'rustling'.

On p. 163 he mentions a number of Dutch words ending in ch, s, f, and t, 'Which often have a sound intermediate between narrow and broad and may, therefore, just as well be indicated by g, z, v, and d.' (For similar remarks in earlier Dutch writers and Ten Kate, see Zwaan's ed. of Van der Schuere's 'Nederduydsche Spellinge', pp. 56 f)

That Montanus replaced his original three-point contrast of voice, noise, and voice plus noise by a two-point contrast is, in a way, an improvement. That he ended up by considering what may be called the lenis/fortis opposition as more important than the voice/breath contrast is less satisfactory, but understandable, since the language under investigation was Dutch.

It is interesting to compare Montanus' remarks in the Appendix with the statement occurring in Kruisinga's 'An Introduction to the Study of English Sounds' (7th ed., Groningen, 1940, p. 20) that '...the contrast between strong and weak (or hard and soft) is more important in Dutch than the contrast between breathed and voiced'. (See also E. Blancquaert, *Practische Uitspraakleer van de Nederlandse Taal*, Antwerpen, 1953, pp. 42 f. on Dutch [p], [t], [k], [x], [s], [ʃ], and [f] often being pronounced with voice, while retaining their 'tenseness', and [b], [d], [g], [ɣ], [z], [ʒ], and [v] as voiceless, but 'loose' sounds, and cf. Bertil Malmberg, *La Phonétique*, Paris, 1954, pp. 61 f.)

It would seem that Montanus' 'narrow' and 'broad' correspond to Sweet's 'tense' and 'loose' (*A Primer of Phonetics*, 3rd ed., 1906, p. 34) rather than to Sweet's 'narrow' and 'wide', although Montanus applies his terms to the vowels as well. (Cf. Zwaardemaker and Eijkman, *Leerboek der Phonetiek*, Haarlem, pp. 159 ff.)

Montanus' observations on 'narrowness, stiffness, firmness, and tenseness' in voiceless consonants as opposed to 'broadness, laxness, looseness, and spaciousness' in the corresponding voiced ones anticipate the findings of some of the nineteenth-century 'direct palatographers' (cf. D. Abercrombie, *Direct Palatography*, *Zeitschrift für Phonetik und allgemeine Sprachwissenschaft*, 10, I, pp. 21 ff.)

S.W. Carruthers in his 'A Contribution to the Mechanism of Articulate Speech', Edinburgh M.D. thesis, 1899 ( published in an abridged version in *The Edinburgh Medical Journal*, vol. II, 1900, pp. 236, 332, 426), writes on p. 95 that 'voiced phones have larger contact-areas than their voiceless correlatives' ( see also pp. 52, 60, 66, 85, 89, 91, 97 of his thesis) and mentions Thausing's plea for the retention of the terms 'hard' and 'soft' to indicate the difference in muscular activity and degree of hardness of the organs between voiceless sounds and the corresponding voiced ones. ( Cf. G. Noël-Armfield, *General Phonetics*, 4th ed., Cambridge, 1931, pp. 138 ff and figs. 7-12 on pp. 143 f. Figs. 19 and 20, for [ɣ] and [x] form an exception to the rule.)

Hermann Gutzmann also found that 'Die Konsistenz der Verschluss-teile ist bei der Media weich, bei der Tenuis hart' and 'Die Berührungsflächen sind bei der Media gross, bei der Tenuis klein' ( see his 'Physiologie der Stimme und Sprache', Braunschweig, 1909, p. 171, and pp. 162 ff on his methods of investigation, which included direct palatography).

Scripture ( *The Elements of Experimental Phonetics*, New York, 1904, pp. 304 f), however, states as a general rule that voiceless consonants have a more extended contact than the corresponding voiced ones, though Kingsley's palatograms ( Scripture, p. 303) for the pairs [t]/[d], [f]/[v], [s]/[z], and [tʃ]/[dʒ] show no difference in the area of contact, while

[g] has a larger wipe-off than [k], and Rousselot's palatograms, which, like Kingsley's, were obtained with an artificial palate, give mixed results ( Scripture, p. 305).

In figs. 32 and 33 on p. 50 of Maurice Grammont's 'Traité de Phonétique,' 4th ed., Paris, 1950, [t] has a larger area of contact than [d], while for [ka] and [ga] the reverse is true.

Blancquaert, op. cit., p. 101, shows identical palatograms for [tə]/[də], [s]/[z], [ʃə]/[ʒə], and [xə]/[çə], but a larger wipe-off for [kə] than for [gə] (see also D. Jones, *An Outline of English Phonetics*, 8th ed., Cambridge, 1956, par. 527, p. 145; L. Kaiser, *Biological and Statistical Research concerning the Speech of 216 Dutch Students*, *Archives Néerlandaises de Phonétique Expérimentale*, tome XVII, 1941, p. 195).

#### 5.4

The fourth Divisio in genere of the forms (M.Bk I, pp. 21ff) is according to the shape of the floor of the mouth. By this, as we shall see, Montanus really means shape and height of the tongue.

These forms are either high-floored or low-floored. The low-floored forms are of two types. In all three forms the tongue lies stretched across the floor of the mouth, but in the high-floored forms it is slightly raised and curved in the middle

like a bridge. They may, therefore, be called 'convex' or 'bulging', but, rather unexpectedly, Montanus usually refers to them as 'flat' forms. In them the corners of the lips, and hence the cheeks, are natural or loose, i.e. neither contracted nor expanded.

In low-floored forms there is no raising of the tongue towards the palate. The corners of the lips, and hence the cheeks, are contracted. Low-floored forms are either 'moderately hollow' (lit. 'hollowish') or 'hollow'. In the moderately hollow forms the middle of the tongue is slightly lowered, and the corners of the lips and the cheeks are slightly contracted.

One gathers that there is a decided dip in the middle of the tongue in the hollow or 'concave' forms, but Montanus forgets to mention it. In the hollow forms the corners of the lips, and hence the cheeks, are as closely contracted as possible. These forms give rise to flat, moderately hollow, and hollow letters, respectively (M. Bk II, pp. 39 ff).

In flat letters the tongue is raised highest towards the palate, and the lips are loose. The sound produced is flat.

In moderately hollow letters the tongue is lower in the mouth, i.e. further away from the palate, and the lips are moderately contracted. The sound is hollowish.

In the hollow letters the tongue is drawn in, leaving a cavity from the palate to the floor of the mouth, and the lips are strongly contracted.

Like the other terms, the term 'hollow' is used to refer to auditory impression as well.

[e] is an example of a flat vowel; it has a flat, shallow figure. Hollowish [ø] has a middle-floored figure. Hollow [u, +] has a deep-floored and hollow figure.

That some free-sounders (i.e. vowels) are pronounced with contracted lips, while others are not, can be seen with the eyes and felt with the hands. Hence Ramus and his followers have set up a division of the vowels into 'diductae' ( a, e, i ) and 'contractae' ( o, u, y ). For them the state of the lips constitutes the principal and essential (i.e. specific) difference. This is incorrect. Expansion and contraction of the lips are accidents. An 'o' pronounced with unrounded lips remains an 'o,' though not so perfect as otherwise. This happens, when one pronounces some words containing 'o' while laughing or smiling, or with the lips wide open or in some other way. On the other hand a kind of 'a' can be pronounced with contracted lips. 'Diductio' of the lips is not a natural and necessary property of a, e, and i, but looseness of the lips is, i.e. the absence of either contraction or expansion.

[ Note that Montanus himself ( Bk II, p. 68) concludes that [y] is moderately hollow, because it has moderate contraction of the lips.]

Ramus and his followers only recognize two species, while in reality there are three. They have only six vowels, and in the consonants they do not make the distinction for the Mutae,

while they mistakenly divide the Liquidae into 'diductae' ( s , l, r, m, n ) and 'firmae' (i.e. 'contractae') ( j, v, f ). Their diductae can also be contractae, and their contractae are quite as often diductae, or rather, loose.

In the words 'salem' and 'nar' s, l, r, m, n (their diductae) are loose, but in 'Solon' and 'mor' they are contractae.

On p. 41 Montanus prints a number of minimal and near-minimal pairs containing vowels agreeing in everything except 'flatness or hollowness of sound'. They are all root vowels, i.e. they all have the dividing-door or narrowing at the back of the mouth, but they differ in shape and height of the tongue.

On p. 42 Montanus points out that instead of the usual five or six vowels he distinguishes at least twenty-one ( forty-two, if the different ways of breathing ( snap and steady; see below, 5.5 ) are taken into account). In each of the seven ( Appendix: eight) places where the dividing-door can be, the tongue can be given each of the three shapes, and through each of these forms there can be either snap or steady breathing or snap followed by steady. Most of the resulting forty-two ( Appendix: forty-eight ) different sounds are used distinctively 'in the words and languages'.

The distinction between flat, hollowish and hollow not only applies to the vowels, but to all the letters. This can be tested by pronouncing all the consonants combined with the vowels in one syllable.

## 5.5

The fifth Divisio in genere of the single letters depends on the different ways of breathing through the forms. ( M. Bk II, pp.43ff )

[ Note that there is no corresponding Divisio in genere of the forms, since breathing and forming are two distinct actions.]

Letters can be produced with a jerk of the breath, in which case they are called 'snap' letters, or with a steady flow of the breath, in which case they are called 'steady' letters.

All letters can be either snap or steady, but the free-sounding or ground-letters are most often used as snap letters, viz. when they are the loudest in a syllable.

Every genus of free-sounders has two species (1. snap, 2. steady), both of which are much used in the 'speeches'.

The same distinction can be made in the cleavers or not-free-sounders. [ What Montanus means is that consonants are 'snap' when they are syllabic. His use of the word 'cleaver' is rather unfortunate, since a cleaver is a non-syllabic consonant; see above, 1.3, Partitio.]

The difference is so great that letters which differ only in this respect are separate species. There is general agreement about i and u being vowels and j and w consonants, but people will be surprised to hear that i and u when following a free-sounder are consonants, too, and that the same applies to the second (steady) elements of aa, ae, ee, ie, etc. ( i.e. 'long' [a], [ε], [e], [ι], which Montanus looks upon as double letters, consisting of a short stressed vowel (the snap vowel) and another vowel of the same form, but produced with steady breathing.)

All this is proved by the following arguments:

1. It can be heard. In aa, ae, ee, ie, etc. (see above) the two free-sounders are of the same genus and form, but the first sounds snapping and higher, the second steady and lower. The same difference exists between j and i in 'ji' and between w and u in 'wu'. This audible difference can be felt to be caused by jerkiness and steady action of the breath with the chest and breathing muscles (...dat dit hoorlijk onderscheit, door de Horting des Aesems met de Borst en Aesemmuizen, en Staechwerking des zelfs voort gebracht wort, Bk II, p. 44).
2. A snap vowel can be followed by as many as four cleavers or consonants in the same syllable, a free steady vowel cannot be followed by more than three, and two steady vowels can be followed by no more than two. Snap e is followed by four consonants in 'erfst', 'herfst', but ej can be followed by three at most, eej and eew by two only. This proves that j in ej, ej in eej, and ew in eew are consonants, not vowels. If they were vowels, they could be followed by more consonants.
3. When inflectional endings are added to words like 'glij', 'kouw', giving 'glijjen', 'kouwe', the two j's and w's will be found to be identical, and as the second j and w are consonants, the preceding ones must be, too. And if u and i following another free-sounder are steady or consonants, all other free-sounders in that position must be consonants. It is true, word final f, s, ch, t sometimes change into

v, z, g, d, when an inflectional ending is added, but this happens only after a free steady vowel, and these consonants remain steady.

4.

Just as l is the same in li and il, j and w remain the same in ja and aj, je and ej, wa and au, except that when they follow, they sound stronger, but they are and remain steady or consonants.

5. Any thing can have only one form, but the essential form of a syllable is in the sound of a vowel, which I call snap sounder. Hence there can be only one in a syllable. If there are many free-sounders in a syllable, one must be a free snap sounder and the others steady or consonants.

The other genera of letters, the not-free-sounders, can also be divided into vowels or snapping letters, and consonants or steady letters. They can be pronounced as syllable peaks (Montanus uses the adjective 'toppich') and in some words this is actually done, e.g. 'werlt', 'harp', 'Dirck', etc. (see Bk II, p. 45, 5th line from bottom), when pronounced in such a way that they make the impression of being disyllabic. It seems as if in that case a free snap sounder is added, but that is not so. The reader should pay attention to the shape of the forms in 'schelm' pronounced disyllabically. He may think he hears an i or e between l and m, but there is no opening in the mouth. The mouth is first closed by the tongue touching the teeth, and then by the lips coming together.

What one thinks one hears is in reality the unfree snapping of *m*. Other not-free-sounding letters are sometimes pronounced as if they were syllables, e.g. *chs*, *chs* [*xs*] in shooting off birds, or *st* in asking for silence, or *mm*, *mm*, *mm* in humming with closed lips, or *nn*, *nn*, etc. in humming with the door shut at the teeth, and in a thousand different ways. That these sounds without free snap sounders have the nature of syllables is clear from poetry.

In the two lines of verse printed on p. 46 -*rnn* of 'koornn', *Chss*, *Chss*, and -*rrk* of 'vorrk' take the place of syllables. One of the non-free-sounders in these groups must be a snap letter, i.e. a vowel. Normally they are steady. There can only be one snap letter in a syllable, because every snap letter causes a peak.

Letters differing in snapping and steadiness are separate species. *i* and *j*, and *u* and *w* are distinct species, but their only difference is in snapping and steadiness. Hence all letters differing in this way must be separate species. By general consent *i* and *j* ( and *u* and *w* ) are distinct letters. The difference between them can be heard in the syllables *ij* and *jij* , *ijl* and *jillis*, *ijs* and *jis*, *uw* and *wu*, etc.

A letter cannot be a vowel and a consonant at the same time.

[ Montanus' distinction between snap and steady vowels, which strikes the modern reader as a pre-echo of Sievers' 'stark oder schwach gesch<sup>h</sup>ittener Accent' and 'fester oder loser Anschluss' ( free and close contact), and Stetson's chest-pulse

theory, at the same time harks back to Dionysius of Halicarnassus' definition of the short and long vowels, for which see W. Rhys Roberts' edition of 'De Compositione Verborum', p. 142, and Steinthal II, p. 196.

The modern phonetician, to whom free and checked or long and short vowels belong to an entirely different level of analysis from any of the other 'Divisiones in genere' so far discussed, should not be surprised that Montanus introduces them where he does, since for him the distinction applies to all sounds.

Syllabic consonants had been recognized before Montanus by Ickelsamer, Smith, Hart, Gil, and others. ( Cf. Spieghel, Twe-spraack, 1584, p. 16: In the interjection 'st' the consonants have some sound of their own.)

In some of his examples Montanus clearly confuses svarabhakti with syllabiness of consonants. Note that in the poem preceding the Introduction ( p. 6, l. 8) Montanus himself uses 'werric' instead of 'werc(k)' for the sake of the metre.

( On svarabhakti represented by i in Holland, see A. Weijnen, Zeventiende-eeuwse Taal, Zutphen, 1952, p. 26 ).

'W(a)er(e)lt' as a word that may be either monosyllabic or disyllabic is mentioned by Spieghel, Twe-spraack, p. 61, and Van Heule, 1625, ed. Caron, p. 67. Montanus mentions it again under diaeresis (M. p. 118).

On -lm, -rl, -rm, -rn suggesting another syllable, see Van der Schuere, 1612, ed. Zwaan, pp. 24 f, 27, and 65. ]

## 5.6

The sixth Divisio in genere of the single letters is according to the parts of which they consist ( M. Bk II, pp. 47 f).

Letters may be naked or clothed. The naked ones have nothing but a letter-ground. Examples of naked letters are the first a (snap a) in 'aarde', 'aap', and the first e in 'eezel', 'eeven', 'eet', when one begins to pronounce or breathe them after their form has been prepared. ( Naked letters are not followed by glides.) The naked letters are the shortest. They can easily be combined with other letters of the same form. They are produced with a permanent form.

Clothed letters consist of a letter-ground and one or two cleavers. They are produced with a changing form. They can combine with letters of different forms. They are either half-clothed or fully clothed.

The half-clothed letters have a letter-ground and a cleaver. They are caused by a form which changes to ( lit. steps towards) another. They can easily combine with a letter of a different form on one side. They are moderately long. They can be clothed in front or at the back. Examples of front-clothed letters are the ones underscored in the following words: jaa, raat, gaa, groot, goot, gall, moll, beff.

Examples of back-clothed letters are the a and the second l

in 'all', and the second e in 'een', 'eet'.

Fully clothed letters have a ground and two cleavers, e.g.

the a in 'dat', 'was', 'bal', and the r in 'draech', 'smorl'.

They can have a letter of a different form on either side.

The central a and e in 'Aäaron' and beëdicht' are naked,

because they are surrounded by letters of the same form.

Their form remains and does not change. The cause of a cleaver

is not there, and hence the deed or the cleaver itself is

absent.

## 5.7

( M. Bk I, Chap. X, p. 23) The Divisio in specie of the Forms, i.e. their distribution from high genera to low species (see above, 1.3, p. 20).

The forms can be distributed in a variety of ways. Each of the four divisions can be first, second, third, or fourth in the series. This gives 24 different divisions, since with each of the four in turn placed at the top, the order in which the other three can follow is sixfold, and  $4 \times 6 = 24$ .

Moreover, different arrangements are possible within each of the four divisions. The table on p. 24 shows one of these various possibilities.

( M. Bk II, Chap. VIII, p. 49) The Divisio in specie of the single speech-letters.

Montanus here deals with the six summa genera discussed in the earlier chapters of Bk II. The seventh (broad/narrow) set up in the Appendix (see above, 5.3) is, of course, not considered.

The letters can be distributed in at least one hundred and twenty ways, according to the order in which five genera are arranged under the sixth. By rearranging the species of each genus numerous other series can be set up.

The first table on p. 49 indicates one possible arrangement of the six genera, while the second is a shortened version of the first. This table yields 2520 species of single speech-letters, as shown at the top of p. 50. (The multiplication intended there is, of course:  $5 \times 7 \times 3 \times 3 \times 2 \times 4$ .)

Montanus admits that this enormous number of species is considerably reduced by the fact that in some genera, such as the trills, splits, and others, subdivision has to be given up much sooner than in others. Moreover, it would take too much time to find out whether all these species of letters can be pronounced, and if so, whether they are actually used in languages and in which.

On p. 24 of the Introduction Montanus starts from the four summa genera  $\text{ā}$ ,  $\text{ē}$ ,  $\text{ī}$ ,  $\text{ū}$  ( see below, Chapter VI).  $\text{ā}$  has three places,  $\text{ē}$  two,  $\text{ī}$  two, while  $\text{ū}$  is undistributed. Together they yield eight lower genera of letters, each of which can have three different tongue-shapes, giving twenty-four still lower genera. Each of them can be either broad or narrow, which gives rise to forty-eight genera, each of which can be either snap or steady, giving ninety-six. (Cf. Sweet's Primer of Phonetics, 3rd ed., pp. 13 ff.)

$4 + 7 + 24 + 48 + 96 = 179$  genera and species.

The alternative division suggested by Montanus on the same page starts from twelve summa genera, viz. a, e, i, u with three tongue-shapes each. ( The o in the series of vowels in the last paragraph of p. 24 Inl. should be cancelled.)

The results obtained here (Table I, p. 25 Inl.) are:

$12 + (3 \times 3) + (2 \times 3) + (2 \times 3) + (2 \times 21) + (2 \times 3) + (2 \times 48)$   
 $= 177$  genera and species. The rearrangement shown in Table II

| yields: | shape of tongue | pl.of art. | broad/narr.          | snap/steady |                           |   |                            |
|---------|-----------------|------------|----------------------|-------------|---------------------------|---|----------------------------|
| a       | 3               | x          | 3                    | x           | 2                         | x | 2                          |
| e       | 3               | x          | 2                    | x           | 2                         | x | 2                          |
| i       | 3               | x          | 2                    | x           | 2                         | x | 2                          |
| u       | 3               |            |                      | x           | 2                         | x | 2                          |
|         | 12              |            | $\frac{9+6+6}{= 21}$ |             | $\frac{18+12+12+6}{= 48}$ |   | $\frac{2 \times 48}{= 96}$ |

$12 + 21 + 48 + 96 = 177.$

Notes to Chapter V

- 1) The 'forms' are not themselves 'phonèmes', as Pernot (op. cit. p.174) believes.
- 2) In one of his two treatises on Dutch shorthand ( MS Sloane 932 fols. 17 b ff) Lodwick proposes 'Lit oft woortlit' (member or word member) for 'letter', and 'woort deel' (word part) for 'syllable'.
- 3) It is surprising that Montanus quotes these, rather than earlier and greater authorities.  
On the letter as the minimal element of language in the Greek and Roman writers, see R.H. Robins, *Dionysius Thrax*, T.P.S., 1957, p. 85; Jeep, pp. 109 f.
- 4) Cp. Rousselot's 'intra-buccales' and 'extra-buccales'.
- 5) On Johannes Cloppenburgh see Verschuur p. 57.
- 6) Cf. Holder, p. 3: '...the reader ( is to ) make trials and examinations.'
- 7) Montanus' word is 'clinker', which by his time must have been fairly well established in the sense of 'vowel'. De Heuiter, 1581, p. 39, uses 'klaincker' and 'meklainer' for 'vowel' and 'consonant'. From *Twe-spraack*, 1584, pp. 15 f, we gather that these were new words. Cf. Lodwick, MS Sloane 897, fols. 21 ff, MS Sloane 932, fols. 17 ff, '(self)luiden' for 'vowel', 'med'(met)luiden' for 'consonant', and 'twevult luiden' for 'diphthong'; MS Sloane 932 fol. 4 b: 'Vowels or Sonants, consonants or with sounders.'

8) 'Ruispoglade (que je me charge pas de traduire', Pernot, p. 176) is a misprint not corrected by Verschuur.

9) Cf. Wallis, Cooper, Amman, and Ten Kate (Van der Hoeven, pp. 61 and 69) on hoarseness.

CHAPTER VINOTATION

Chapter IV of the Introduction (pp. 16 - 29), entitled 'Of Signification' contains a statement of the principles of Montanus' terminological apparatus based on the six 'divisiones in genere' of the forms discussed in Book I, and on distinctions made by him in the remaining five books.

Coming where it does, this chapter has a bewildering effect on the reader, who is here presented with a vast number of technical terms which have not yet been defined.

I, therefore, propose to deal with some of the sections of this chapter in what I believe to be more appropriate places.

However, as the 'divisiones in genere et in specie' mentioned above are followed in Montanus' book by a detailed treatment of the vowels and consonants, it may be useful at this point to summarize the relevant passages from the introductory chapter as well as some of a more general nature.

(Inl., p. 16) Communication between human beings about things hidden or absent must be brought about by means of signs which indicate the object by likeness or by convention.

[Cf. Burgersdijk, p. 84: Signum arbitrarium est, quod ex institutione significat ...

Signum formale est, quod rem **representat** ... Aristoteli ὁμῶταμα, id est, simulacrum dicitur, cap. 2 de interp.

Cf. C.S. Peirce's distinction between icon and symbol (W.B. Gallie, Peirce and Pragmatism, Harmondsworth, 1952, p. 116; Philip A. Wiener, Values in a Universe of Chance, Selected Writings of Charles S. Peirce (1839 - 1914), Garden City, New York, 1958, p. 368.]

As I intend to reveal many new things in this book, I have had to institute and use many new signs and redefine old signs for the purpose. In order that these may be understood and used by others I here present a description and interpretation of them.

Letters are indicated by three kinds of signs or means:

1. names, 2. symbols, 3. signs consisting of both.

1. The names are also of three types, viz. a) defining names, like choked letter, free snap-vowel, b) spelling names, like aa, bee, c) a combination of defining and spelling names, like snap aa, steady aa, moderately hollow inner-middle  $\text{eu}$ , hollow middle oe.

(p. 17)

2. Naked symbols are those to which no diacritic is added, like a, b, c, d, i.

$\acute{o}$  to indicate a moderately hollow o is an example of a clothed symbol.

[ The spelling name of the roof-nose letter [ $\eta$ ] is eng, its symbol is ng or  $\text{,n .}$  ]

3. Signs consisting of names and symbols are steady u, hollow f, toothflesh (= alveolar) l.

[ The corresponding names (type lc) would be steady uu, hollow ef, toothflesh el. The plural of hollow ef is hollow effens, of hollow f, hollow ff. ]

Some of the above 'signs' can be used to indicate higher as well as lower genera and species, others only apply to individual letters.

(p.18) In the tables symbols are used instead of names, but the free-sounders are always indicated by names, even in the tables. The reason for this is that Montanus has discovered so many new ones that he would have had to invent a large number of new symbols, which would have been either unintelligible to the reader or else a heavy burden on his memory.

For the sake of uniformity he even uses names in cases where the traditional symbols a, e, i, o, u, j, w might have been adequate.

This is the only occasion on which Montanus takes pity on his readers, and one wishes he had not.

On page 21 of the Introduction he shows his aversion to new symbols and his preference for old ones with diacritics added by proposing superscript marks to indicate the categories of steady, snap, flat, moderately hollow, hollow, broad, and narrow, and subscript marks to indicate the various degrees of 'depth', i.e. the frontness or backness of a sound relative to its genus. Thus, the mark which under a roof letter indicates middle depth, shows alveolar articulation under a tooth letter. An additional complication is that e.g. n, means alveolar nasal as distinct from dental n , while ,n means velar nasal.

(All these diacritics are shown in the table on p. 24 Inl.)

(p. 22) He is so anxious to retain the traditional symbols for the vowels <sup>1)</sup> that he feels compelled to produce a variety of complicated arguments to defend them.

Thus, aa, oo, ee, uu are 'proper' symbols, because they indicate long vowels.

ae, eu, ui, though improper (because they suggest diphthongal pronunciations, while in fact they stand for single vowels), are defended as follows:

ae, whose value is [ɛ], an inner-middle vowel, is intermediate in 'depth' between (root) a ([a]) and (middle) e ([e]), indicated by the first and the second letter, respectively;

ie is intermediate in depth between e and i, the second and the first letter, respectively.

eu ([ø]) has the same depth as its first letter e ([e]) (a middle-vowel), and is moderately hollow like (one type of) u, viz. 'u ([y̥]), indicated by the second letter.

In ui, however, the first letter indicates the degree of hollowness, while the second indicates depth.

Similar arguments have to be put forward for the improper symbols ɛu, oɛ, uo, (u)oi, which he has had to make up 'from necessity', e.g. ɛu has the same depth as ɛ (= ae), and the same degree of hollowness as u, while oɛ has the hollowness of o, and the depth of ɛ.

(p. 23) A breve placed over a digraph consisting of two different letters indicates that it represents a short simple ('single' in Montanus' terminology) vowel. Thus ɛ̇u stands for a short vowel, eu for the corresponding long (or double) vowel, ew for a diphthong.

The corresponding shorts of aa, ee, ii (or ij), oo, and uu, are, of course, a, e, i, o, and u.

(p. 24) After having shown how vowels can be indicated with as little innovation as possible, Montanus now shows briefly

how it can be done more conveniently by introducing a few novelties.

Four 'summa genera' of single vowels can be symbolized by  $\text{ɶ}$   $\text{ɷ}$   $\text{ɸ}$   $\text{ɹ}$ , which represent the following points or areas of articulation: crop <sup>2)</sup>, roof, tooth, and lip.

To indicate the specific differences constituting the various species of these summa genera the diacritics mentioned above can be added to the basic symbols. In this way all the genera and species of vowels and their nature and properties can be expressed as perfectly in symbols as would otherwise have to be done with the help of long defining names.

[ Cf. Jespersen's 'Articulation of Speech Sounds represented by means of Analphabetic Symbols', 1889. ]

The table on page 24, Inl. shows how 179 genera and species of single vowels can be derived from the 4 summa genera and how they can all be symbolized and provided with defining names. (See above, 5.7).

(p. 25) The tables at the top of page 25 show an alternative arrangement, yielding 177 genera and species.

The table on the right is an elucidation of the one on the left.

The double (i.e. long) vowels can be symbolized by putting the symbols for the single (i.e. short) vowels together.

Montanus' discussion of the notation of vowels is followed by some general remarks on the traditional spelling of Dutch words.

Spelling is proper or improper. Improper spelling may suffer from superfluity or from deficiency or from usurpation (M. vervoe-ring, lit. abduction).

[On these orthographical vices see Quintilian I, iv, 7 and

I, v, 6: adiectio, detractio, immutatio, transmutatio;

Terentius Scaurus, 'De orthographia' (Keil VII, 11): scribendi autem ratio quattuor modis vitiatur, per adiectionem, detractio-nem, immutationem, adnexionem (quoted by Lersch, III, 180);

Donatus (Keil IV, 392.7): adiectio, detractio, immutatio, transmutatio (cf. Kukenheim, 1932, p.12);

Meigret, 1545: diminution, superfluité, usurpation (Brunot, p. 96, Livet, p.53);

Hart, 1551, ed. Danielsson, p. 121: 1. diminution, 2. superfluite, 3. the usurpation of one letter for an other, by their confusable double powers, 4. the mysplacing and disordering of them;

Hart, 1569, ed. Danielsson, pp. 179 ff: 1. A diminution, 2. superfluitie (to show derivation or difference), 3. usurpation of powers, 4. misplacing of letters.

Cf. Robinson, 1617, ed. Dobson, p. 5; Gataker, 1641;

Cooper, 1687, ed. Sundby, p. 23.

And see Jellinek II, p. 11: Ickelsamer (1527): Vom überflusz, mangel vnnnd verwandlung vnsers A be cees.

Ibid., p. 51: Frangk (1531): Vom vberfluss vnd müssiggang ettlicher Mittstimmer, Vom Mangel vnd Gebroch der Buchstabenn, Von vnrechtem wechssel vnd versetzung der Buchstaben, Das nichts

frembds abgethanes eingefürt wird.]

Improper spelling may be due to origin, i.e. the foreign spelling of loan-words may be retained (e.g. Psalm for Zalm), or to derivation, e.g. vraeg [vra·x] instead of vraech, because of vraegen [vra·γən]. On the other hand vraechde is often used for vraegde and similarly f for v, and s for z, and vice versa, e.g. leefde for leevde (because of leef), raesde for raezde (because of ræs), 't vaert for 't faert (because of vaert), etc.

Often the cause of improper spelling is custom, or lack of proper symbols, or ignorance of the letters and their number in syllables, words, etc.

(Inl. p.26) As in actual language one is at liberty to use improper as well as proper (scil. words ?), it seems that a certain latitude has to be allowed in spelling as well, especially in cases where the proper value of a symbol can be gathered from the context. However, properness is a greather necessity in spelling than in language, since spelling should not only be understood, but read as well, and it consists of symbols of symbols <sup>3)</sup>. Moreover, many people are less skilful or experienced in the use of spelling than in that of (spoken) language. Finally, spelling (= written language) is more often presented to persons absent than to persons present. Therefore, 'improperness' in spelling should be applied uniformly and consistently. In this book I have used proper spelling wherever possible, and where I practise 'improperness' to avoid too great a deviation

from common usage, I do so consistently.

Everything said so far about notation or spelling in this chapter pertains to 'symbolization of the matter' (stofmerking).

'Symbolization of the form' (form-merking) consists in

1. the arrangement of the symbols of the matter (i.e. those indicating articulatory segments) in such order as the things signified by them have in lettered speech (i.e. in syllables, words, 'sentence slices', 'sentence members', and sentences, which all consist of letters), and 2. the addition of marks indicating height or loudness, and junction <sup>4</sup>).

(Inl. p. 28) Looseness, the opposite of junction, may be taken to be indicated by the absence of junction-marks. However, to distinguish it from word-junction, which is indicated by spaces between the words, (.) may be used to show looseness of egressive speech, both of words and of the larger units.

Letters and syllables are never loose. (.) following them is an indication of abbreviation, not of looseness, e.g. M.T.Cic. Moreover, (?!) may be used to denote looseness of ingressive speech, being speech which I have discovered, but not yet described <sup>5</sup>). For want of other marks (?!) may also be used to indicate ingressiveness itself.

Looseness of parenthetic speech is denoted by ( ).

I would have used many more marks, if types had been available

for them.

The chapter ends with an apology for the large number of misprints occurring in the book, which are due to the 'novelty and unusualness of the matter and the spelling' and to the fact that Montanus 'was rarely able to be present'. 6)

Notes to Chapter VI

- 1) Montanus' term is, of course, free sounder. The word 'vowel' (vocaël) is reserved for phonological purposes, see below, Chapter X.
- 2) On 'crop' see Montanus, p. 160; below, Chapter VII.
- 3) Cf. Aristotle, 'De interpretatione' 1.
- 4) In the present account of 'The Art of Speech' summaries of Montanus' remarks on the notation of these prosodic features have been distributed over the various sections dealing with the latter.
- 5) Van Helmont and Amman mention ingressive speech in connection with ventriloquism.
- 6) The list of corrigenda on pages 29 f is itself full of errors.

CHAPTER VIITHE VOWELS

On pages 49 - 75 of Book II Montanus enumerates and illustrates the 'free letters', i.e. the vowels and fricatives (see above, 5.1, p. 103).

It has been thought advisable to give a summary of Montanus' treatment of the 'free sounders' (i.e. the vowels) in the present chapter and to deal with the 'free rustlers and rustle-sounders' along with the other consonants in Chapter IX.

Montanus' numerous illustrations of the individual vowels have been replaced by an indication in I.P.A. symbols <sup>1)</sup> of the Present-day Dutch (Pres. Du.) values of the vowels in the words listed by Montanus. In most cases the conjectural Middle Dutch (M. Du.) value has been added in more or less traditional philological notation.

It should be remembered that in Montanus' system the short (= 'snap' or 'checked') vowel is always identical with the 'first element' of the corresponding long (or 'free') vowel <sup>2)</sup>. Long vowels are, in fact, double letters; they consist of a 'snap' vowel and the 'steady' vowel 'formed with the same form'.

Throat Vowels

(M. p. 50)

In the throat six vowels are produced, viz. flat, moderately hollow, and hollow, each of them snap and steady.

They occur as variants of the corresponding root letters,

and, although their sounds are noticeably different from those of the root letters, their substitution for them in words does not bring about a change in the essence and meaning of those words. They are used by many in their ordinary speech, because they sound more dignified and manly.

(p. 160) In the Appendix Montanus divides the throat into two parts, viz. the larynx and the uvula. Each of these is a 'place' for vowels of the flat, moderately hollow and hollow types, which can each be either snap or steady. The number of throat vowels is thus raised to twelve, which can all occur as variants of the root letters.

Flat [a] can be pronounced indiscriminately as a larynx, a uvula or a root letter, i.e. without changing the meaning of language words.

In the same way moderately hollow [ɔ] and hollow [o] have three places each without being distinctive.

For this reason these three genera (larynx, uvula and root letters) may be grouped together under the name of crop letters.

(M.p.53)

#### Inner-Mouth Vowels

##### I. Letters of the Root, Inner Middle and Middle

As examples of the flat root snap vowel he gives words containing Pres.Du. [a], which is believed to have had much the same value in M.Du.

The corresponding steady vowel is the second element of [a·] (M.Du. ā), which is traditionally considered to be 'the long'

of [a].

The flat inner-middle vowel can be easily identified as [ɛ]. The two examples given on page 53 are snap + steady ae, which is Pres.Du. [a·], but he equates the sound with Greek Etha, Hebrew Tsere or Tseri, French es in teste, beste, mesme, and with the bleating of sheep.

An example of the snap vowel occurs on page 105 (stërre), and there are four more on page 160.

On page 96 Tsere is equated with ee or ae (i.e. [e·] or [ɛ·]).

[Seventeenth-century Hebrew grammars describe şere as 'E clarum et siccum, e clausum seu rotundum, H Gręcum, sive etiam E plenum', and compare it with the vowel in German 'eer, leer, meer'.

In modern works the Sephardi pronunciation is given as [e:], see Chomsky, p. 12, and Diringer, p. 184, but G. Beer, Hebräische Grammatik (1915) I, 33, referred to by Verschuur, p. 98, gives [ɛ].

For the seventeenth-century descriptions of this and the other Hebrew vowels mentioned by Montanus, see Keckermann, 1600 (?), 1625 (?), pp. 24 ff  
Wasers, 1600, pp. 17 ff; Wasers, 1609, pp. 6 ff  
Buxtorf, 1609, pp. 8 ff  
Alsted, 1630, p. 281.]

Montanus points out that in spite of the spelling it is not a diphthong. The traditional spelling (ae) is an attempt to show that this sound is intermediate between (root) a and (middle) e.

(p. 54) The flat middle vowel is [e]. The snap + steady examples contain Pres.Du. [e·] (M.Du. ē̄ and ē̄). The snap vowel is illustrated on page 54 by e in de, wandelen, in which all three e's are [e] in Pres.Du. On page 105, however, his example of this sound is the word met, which has [ɛ] in Pres.Du., i.e. the same vowel as the one in Montanus' examples of inner-middle short [ɛ], sterre etc. It would seem that Montanus heard an opener variety before [r], which he analysed as retracted.

On page 35 of Book II he observes that the difference between short [ɛ] and [e] is slight (see above, 5.2, p. 111).

In the Appendix (pp. 160 ff) he says that the difference between inner-middle and middle letters (he erroneously refers to the latter as outer-middle) is often ignored and [ɛ] and [e] are frequently used indiscriminately, especially when short. He prints six words, in five of which short [ɛ] and [e] may be freely interchanged, while in the two others the long ones are interchangeable. (In all the examples the vowel is followed by r.)

He concludes that, therefore, these two genera may be combined into one, which he proposes to call 'front roof letters'.

(p. 55) For the moderately hollow root vowel the examples contain Pres. Du. [ɔ] (Gmc. ǒ, M.Du. ǒ̄) (snap) and Pres.Du. [o·] (Gmc. au, M.Du. ȡ̄) (snap + steady). It is quite likely that the 'long' vowel was still [ɔ], i.e. the short vowel lengthened in Montanus' speech <sup>3)</sup>, as this value survives in some modern dialects.

The moderately hollow inner-middle snap+steady vowel is identified with Guelders and Swiss a, and the two letters of which Hebrew Camets consists. This would make it a kind of [ɔ].

[ By 'the two letters of which Hebrew Camets consists' Montanus means long and short  $\text{Ḳameṣ}$  or  $\text{qameṣ}$ . The long one is described in seventeenth-century Hebrew grammars as 'medius sonus inter a et o, a et o inter se coniunctum, a clausum et obscurum mixtum cum o.' It is almost invariably compared with German a in 'gab, frag, sprach', (See also L. Albertus' Teutsch Grammatick oder Sprachkunst, 1573, ed. C. Müller, p. 23). The short  $\text{Ḳameṣ}$  ( $\text{Ḳameṣ ḥaṭuḫ}$ ) is said to be 'o breve, o correptum', as in German 'Ochs, Sonne'. Diringer, p. 182, (In Anglo-Sephardi)  $\text{qameṣ}$  = a or o according to position. For the difference of opinion about the correct pronunciation of  $\text{qameṣ}$  ( $\bar{a}$  or o) see Chomsky, p. 33, n. 14. Diringer, p. 184  $\text{qameṣ}$  = a (as in 'father')

$\text{qameṣ ḥaṭuḫ}$  = o (as in 'not')

G. Beer, Hebräische Grammatik (1915) I, 32 (Verschuur, p. 115) a dark a, like Swedish a or Engl. a in 'wall'.]

Montanus adds, however, that as regards the degree of mouth-

opening and raising of the tongue it is intermediate between the preceding vowel (i.e. the moderately hollow root vowel [ɔ̄]?) and the next vowel (which is [ø]).

It is interesting to note that in this passage he talks about 'raising the tongue at the back towards the palate' for the root vowel, and 'raising the flat of the tongue at the back' for the middle vowel.

The snap variety of this vowel occurs in the province of South-Holland in a number of words spelt with o, or e, or indifferently with either, which spelling tends to influence the pronunciation in reading 'and otherwise'.

In all these words e or o is followed by r + labial or velar, except in erten, which, however, had a w following the r in M. Du. and is spelt with w in Pres.Du.

The snap vowel also occurs in Fr. neuf, meaning nine, while snap + steady occurs in Fr. neuf, meaning new <sup>4)</sup>. It looks as if Montanus is trying to describe a rounded half-open central vowel, an advanced variety of [ɔ] or a retracted [œ] <sup>5)</sup>.

In the Appendix (p. 163) he sets up two new categories, viz. letters which are intermediate between flat and moderately hollow, and those which are intermediate between moderately hollow and hollow. As an example of the former he gives one of his er-words (sterf), which is also among the words varying between [ɛ] and [e] (App. pp. 160 f, see above).

Hence it can have [ɛ], [e] or [ɔ+](?).

(p. 56) The moderately hollow middle vowel is [ø]. His Dutch examples all contain M.Du. *ø* and Pres.Du. [ø] and he mentions Fr. *heureux, eux, leur, cheveux*, as well.

[On Fr. 'leur' pronounced 'leu' see Thurot II, pp. 170 f, Verschuur p. 106, Caron, 1947, p. 41.]

Some of the South-Holland *er/or* words mentioned under the inner-middle vowel can also be pronounced with [ø], in which case the mouth-opening is narrower. The snap [ø] (and sometimes snap+steady [ø]) also occurs as the first element of a diphthong, of which the second element is a steady moderately hollow dental [j]. This diphthong corresponds to Pres.Du. [æi] or [æy] <sup>6)</sup> < M.Du. *ȳ*, and the examples given by Montanus are special words which also have the diphthong in modern dialects in which M.Du. *ȳ* has normally been preserved (cf. Verschuur, pp. 121 f).

(p. 58) The hollow root snap vowel is M.Du. *ō* and Pres.Du. short [o] (= Gmc. *ǔ*), a closer vowel than short [ɔ] (= Gmc. *ǒ*) which is still kept distinct from it in a number of dialects and by many speakers of Standard Dutch; lists of minimal pairs, however, vary from one region, and speaker, to another. The corresponding steady vowel is the second element of M.Du. *ō* and Pres.Du. 'long' [o] (< Gmc. *ǒ, ǔ* in open syllables). On pages 59 and 60 Montanus prints minimal and near-minimal pairs for the moderately hollow and hollow root vowels, both snap and steady. 'The stupidest person who is not deaf can hear the difference' (p. 59).

On page 96 he equates snap + steady [o•] with Gk. omega and

Hebr. Holem.

[ According to the seventeenth-century Hebrew grammarians ' (Vav) Cholem' is 'o longum, id est, perfectum, seu plenum, o productum, ω', as in Lat. 'corona', Gmc. 'Kron, Ohr, Sohn'. Chomsky, p. 12, and Diringer, p. 184 give [o:] for holêm. Greek omega is still often pronounced [o] instead of [ɔ] in Western Europe.]

(p. 59) The hollow inner-middle vowel is illustrated by a number of words which are pronounced with [u] by many people, but not in Delft. Some of these words are pronounced indifferently with [u] or in the Delft way by many in many places.

He remarks that Delft speakers are 'groundlessly made fun of by others' for this particular variant, 'though I myself have changed my pronunciation for that reason'.

The words in question are Gmc.  $\bar{o}$  - words, pronounced with [u·] in Pres.Du., in which the vowel is followed by a labial or a velar ( but not, as far as Montanus knows, by w, ng, or b).

De Heuiter, 1581, like Montanus a Delft man, condemns Delft and Rotterdam 'boec' (= 'book', [bok]) for 'bouc' [buk] (Nederdvitsche Orthographie, p. 74). As late as 1706 A. Moonen, Nederduitsche Spraakkunst, p. 18, represents the Delft way of pronouncing this word by oo (instead of oe). From this and other evidence it has been concluded that Montanus' hollow inner-middle vowel was an open [u] or close [o] (cf. Verschuur, p. 108; Hellinga, Opbouw, pp. 79, 81, 83; Caron, 1947, pp. 105, 107).

(p. 60) Montanus' hollow middle vowel occurs in words with Pres.Du. [u], Gmc.  $\bar{o}$ , M.Du. open (o-like)  $\bar{u}$ , which is either word final or followed by j, s, z, r, l, n, d, t, i.e. by sounds which philologists (and Montanus) would group together for convenience' sake as dentals.

Before [k] it only occurs when [k] is the reduced form of the personal pronoun 'ik' (I), e.g. doe'k, broe'k.

When [k] belongs to the same word, the vowel is inner middle (see above).

All we can safely conclude from its place in the vowel system is that Montanus looked upon this vowel as a fronted variety of open [u].

[Erasmus, 1528, observes that the vowel in 'zoet, goet' as pronounced in Holland is intermediate between o and u.]

On page 60 Montanus provides (near-) minimal lists of his moderately hollow root letter, and hollow root, inner-middle, and middle letters.

(p. 65) II Tooth Vowels (Alveolar and dental)

The flat alveolar vowel is Pres.Du. [i<sup>•</sup>], which in M. Du., and apparently in Montanus' speech, was opener, viz. [ɪ].

(Cf. Verschuur, pp. 114 ff.)

Montanus points out that it is intermediate between the middle vowel [e] and the dental [i].

(p. 66) The spelling (ie) indicates this intermediate position.

The order of the two letters should really have been ei

(cf. ae = [ɛ]), but the spelling ei has its own function, viz. that of indicating the diphthong made up of e and i.

On page 96 'Chirec' is said to be ij or ie (i.e. [i<sup>•</sup>] or [ɪ]).

[ Seventeenth-century Hebrew grammarians describe 'Chirek cum jod = Chirek gadol, sive magnum' as 'I plenum et dilatatum, I productioris sonus, I circumflexum'. It is heard in Lat. 'filum', German 'Isen, Thr'.

'Chirek absque jod = Chirek parvum' is 'I strictum, I obtusum, I correptum' as in Lat. 'pinna', Germ. 'bitter'.

Diringer, p. 184 long ḥîreq = [i:], ḥireq qaṭôn, or short hireq = [ɪ] = hireq without yod (Chomsky, p. 13)].

(p. 66) [i] (M.Du. ī, Pres.Du. [ɛɪ] spelt ij) is the snap + steady flat dental vowel. The snap vowel by itself is Prés.Du. [ɪ] <sup>7)</sup>. The steady vowel by itself is Pres.Du. [j], when in the neighbourhood of a flat vowel, such as [a], [e], [ɔ].

On page 35 of Book II Montanus says that the difference between short [ɪ] and [i] is hardly noticeable.

(p. 66) The moderately hollow alveolar vowel, spelt ue by Montanus, is M.Du.  $\bar{y}$  ( $\bar{ü}$ ), Pres.Du. [y:] <sup>8)</sup>. In all his examples (except one, in which Pres.Du. has [æy]), this vowel is followed by [r].

Montanus himself (p. 67) observes that it usually occurs before r. The Flemings substitute eu ([ø]) for ue ([y:]).

On page 15 Inl. Montanus warns the reader that in a number of cases he may find that the description does not fit the examples. This is not due to any error on Montanus' part, but to a different way of pronouncing on the part of the reader. Thus Flemings will find that his examples of the moderately hollow alveolar vowel ([y:]) on page 66 might have been added

to those of the moderately hollow middle vowel {[ø]} on page 56, as far as they are concerned.

[Lambrecht, 1550, mentions eu for u in Brabant.]

(p. 67) The snap + steady moderately hollow dental vowel is Gmc.  $\bar{u}$ , M.Du.  $\bar{y}$  ( $\bar{ü}$ ) not followed by r, Pres.Du. [æi] or [æy], spelt ui, both by Montanus and in Present-day Dutch.

He points out that it is not a diphthong, and not intermediate between [u] and [i], as the spelling might suggest. It has the same depth as [i], i.e. it is dental, but pronounced with moderate contraction of the lips. This suggests a kind of [y].

Verschuur (op.cit., p. 120) thinks it was a lengthened [æ], rather like [æ:] in Fr. 'sœur', which still occurs in M.Du.  $\bar{y}$  words in Amsterdam and elsewhere in Holland, including the Delft area.

The Amsterdam monophthong that I am familiar with is an unrounded central vowel, not [æ:]. I do not know the Delft monophthong.

[Sounds which do suggest something like [æ] are mentioned by Montanus under the moderately hollow inner-middle vowel (see above) and under the flat lip sound (see below)].

As both this ui and the preceding vowel ue are reflexes of Old West Low Franconian and M.Du.  $\bar{y}$  ( $\bar{ü}$ ), which remained [y:] before [r], but was usually diphthongized to [æy] in most other contexts in the Standard language (cf. Van der Meer, p. 50; Schönfeld, p. 78) it seems acceptable that Montanus' moderately hollow dental vowel was moving away from the [y] position.

Spieghel, 1584, pp. 18 and 38, observes that uy (= Montanus' ui) and uu (= Montanus' ue) are different, that uu occurs before r, but that some people write uy or ui even there.

Van Gherwen, 1624, notes the difference between uu and uy.

Van Heule, 1625/26, ed. Caron, p. 12, says that 'Huys, Muys, Luyt' would be better spelt with uu.

W. a Winschooten, 1683, observes that 'people now say ui for uu'.

Lodwick, Essay, 1686, p. 128, states that Fr. 'dure, une', and 'Lowdutch' 'muis' contain three different simple vowels.

Ten Kate, 1723, I, mentions a monophthongal and a diphthongal pronunciation of uu or ue, and a diphthongal pronunciation of ui or uy (pp. 118, 120).

(M. p. 67) The steady variety of the moderately hollow dental vowel is Pres.Du. [j], when followed or preceded by a moderately hollow snap vowel, such as [ɔ] or [ø].

(p. 69) A moderately hollow alveolar vowel (see above) can be turned into a fully hollow one by lowering the tongue still further and increasing the contraction of the lips. This is actually done by some people in pronouncing the examples given under the moderately hollow alveolar vowel, though Montanus cannot think of any words in which this sound is necessary and distinctive. Still he considers it a special letter.

In the same way the moderately hollow dental vowel can be made into a hollow one. The speaker is at liberty to do this in pronouncing the words listed under the moderately hollow dental.

The steady variety is Pres. Du. [j] preceding or following a hollow snap vowel, such as [o], [u\*+]. This is quite different from moderately hollow and flat j.

(p. 71)

Lip Vowels

The flat lip vowel is identified with u Gallicum, Gk. ypsilon, and Hebr. kibbutz. This suggests a kind of [y] or [ɣ].

[According to the seventeenth-century Hebrew grammars Kibbutz is 'u tenue, u gallicum, sive v Græcorum, hoc est, u cum i mixtum, u et i inter se temperatum' as in Germ. 'Sünde, üben', Swiss-German 'Rüter'.

Beer, I, pp. 32, 35; Diringer, p. 184, and Chomsky, p. 13 give [ũ] for qibbûṣ.]

But some of the examples of the snap vowel have [œ] or [ɶ] in Pres.Du.<sup>9)</sup>, while others are the first element of Pres.Du. [yu]. The steady flat lip sound is w in the neighbourhood of a flat snap vowel.

The flat snap vowel is made moderately hollow by some people without the meaning of the language words in which it occurs being affected. On page 72 he adds that perhaps the first element of his diphthong [ɔu] might also serve as an example of the moderately hollow lip snap vowel.

The corresponding steady vowel is w preceding or following a moderately hollow snap vowel.

(p. 72) The hollow lip vowel is u Italicum, Germanicum, sive Hispanicum, Greek ou, French ou, i.e. [u].

On page 96 he equates this vowel with Hebrew 'Schurec'.

[In the Hebrew grammars '(Vav) Schureck' is described as 'u plenum, u crassum, siue Germanicum, u quale ou Græcorum', as in Germ. 'ruhen, Uhr, uns'.

Chomsky, p. 12, and Diringer, p. 184, give [u:] for Shûreq.] His examples are all spelt with ou and have [ɔu] in Pres.Du.<sup>10)</sup> The steady vowel is w in the neighbourhood of hollow snap vowels.

It should be noted that Montanus' three w's mentioned above are all bilabial on his analysis, and correspond to Pres. (Standard) Du. labio-dental [v] and the [u]-element of diphthongs. In many parts of the Netherlands and Flanders, however, w is bilabial to this day, and there is a good deal of evidence for bilabial w in seventeenth-century Holland (i.e. Holland proper) (cf. A.A. Verdenius, *Studies over zeventiende eeuws*, pp. 136 ff; Hellinga, *De geschiedenis van de bilabiale w*, *Nieuwe Taalgids* 37).

At this point follow two dissertations on the u's (Montanus: 'uuwens'), in which Montanus points out that others have recognized only two u's, viz. 1. Fr. u = Gk. ypsilon = Latin u liquidum = Hebr. Kibbutz, 2. German u = a Greek diphthong (ou) = Hebr. Schurec, apart from w, which in many languages is not recognized, and v, which does not belong here. He distinguishes six different species of single u's and three one-form double u's, hence nine in all.

There are three different genera of single u's: flat, moderately hollow, and hollow (p. 73) because 1. in all other places of depth (root, inner middle, middle, etc. of

the inner mouth) there are three such species<sup>11)</sup>. There is no reason why this should not be so at the lips or outer mouth. 2. one can prove that they are all used in languages (inde Spraken) and differently pronounced, by comparing words containing au, óu, ou [au], [ou], [u·], and waer, wóort, woonen<sup>12)</sup> (ó is his symbol for the moderately hollow root vowel), 3. steady u can be added to all three species of vowels (flat, hollowish, and hollow), both in front and at the back. Therefore, they must be flat, hollowish, and hollow themselves, because it is a set rule that consonants have the same shape as the vowels they accompany, 4. one can feel and otherwise ascertain these three shapes in the free sounders which have the door at the lips. Hence the letters formed together with them receive the same difference.

There are three different genera of u's with two species (snap and steady) each, giving six species in all. Each pair of the same form can be combined into a one-form double. This gives three more species.

However, it is not always necessary in actual usage to distinguish the single u's according to shape of floor. These differences do not always give rise to different language-words; u in the same language-word is pronounced flat by one person, moderately hollow by another, hollow by a third, and one and the same person may vary.

[As his moderately hollow snap u is a largely theoretical category, he must have been thinking of such 'flat/hollow' pairs as duwen/douwen, gruwen/grouwen, ruw/rouw, stuwen/

stouwen, where there is no difference in meaning, -uw- and -ouw- being dialectal variants descended from Gmc.  $\bar{u}$  (cf. Schönfeld, pp. 60, 78).]

Therefore, a different series of species may be set up.

The difference which is necessary for different language-words makes the highest species, under which the other species, whose difference often makes no distinct language-word can be arranged according to personal choice.

Thus u is either snap or steady.

(p. 74) Snap u corresponds to Pres.Du. [æ] or [ʌ], the first element of Pres.Du. [yu], and the first element of Pres.Du. [ɔu] <sup>13</sup>). Hebr. Kibbuts, when short, and Gk. ypsilon, when not subjunctiva (i.e. when it is not the unstressed element of a diphthong) also belong here.

Steady u includes the letter which is called double u from its symbol (Montanus: teiken), when it is a single sound, as in 'waer, wie, wy, woort, wolle, woelen, zwac, zwijch, zwol, zwee, twee', to which corresponds  $\acute{u}$  liquidum (called melting u for the same reason for which r, l, n, m, are called melting letters), as in Lat. 'lingua, sanguis, quis, quod, quo' and Dutch 'quaet, queepeeren, quispel'. Also the second part of It.  $\acute{u}u$  (= [u]) and the second part of Fr.  $\acute{u}u$  (= [y]), when long or double, Greek ypsilon, when it is a subjunctiva and others.

Each of these may (if necessary) be subdivided into two more species, viz. 1. flat (incl. Fr. u), 2. low-floored (incl. It. u) and (if necessary) into three, viz., 1. flat, 2. hollowish, 3. hollow. In this way we arrive at the six species originally set up.

It is a great error to believe that v (voiced lip fricative) is u consonant, i.e. a letter which stands in the same relation to u, as j to snap [i] <sup>14</sup>). This is as wrong as it would be to believe that z is i consonant, or g is a or o or e consonant. Just as g is a voiced roof fricative and z a voiced tooth fricative, v is a voiced lip fricative and differs as much as the others from the free snap sounders (i.e. vowels).

(p. 75) It is w which is related to snap-u. Therefore it cannot be v <sup>15</sup>). Words ending in u, when lengthened take w, and not v. w is consonantal u.

v is most closely related to f (not to u), just as z is to s, and g is to ch; (f changes into v, s into z, ch into g, when the words are lengthened, i.e. when an inflectional ending beginning with a vowel is added).

[Perhaps a brief survey of the principles of vowel classification in the West down to the early seventeenth century may be prefixed to a critical examination of Montanus' vowel system. Front and back vowels are not distinguished till the Hebrew categories come to be applied.

For vowels like [ɑ], [a], [ɛ], [e], [i] the degree of oral aperture or tongue-height ('direction of the breath' in Dionysius of Halicarnassus) is stated, sometimes contact between the sides of the tongue and (molar) teeth is mentioned (Terentianus Maurus and those whom he influenced). The smile which Terentianus Maurus requires for the production of [i] turns up as a grin in 1550 and 1584 (Lambrecht and Spieghel) while [e] has a sweet chuckle

in 1550 (Lambrecht), and is a sigh of relief in 1620 (Bonet). For [ɔ], [o], [u], [y] mention is made of rounding (and sometimes protrusion, e.g. Marius Victorinus) of the lips, while tongue-position is either completely ignored, or it is expressly stated that the tongue is inactive, or that it is impossible to ascertain the whereabouts of the tongue in rounded vowels (Madsen).

These are the materials that went to the making of the vowel system that made such a deep impression on M. Jourdain in 1670 ('Vive la Science!', *Le Bourgeois Gentilhomme*, ii, 4). Editors point out that the descriptions are based on Géraud de Cordemoy's *Discours physique de la parole*, 1668.

Sometimes there are metaphorical or synaesthetic descriptions of auditory impression. One vowel is said to be fuller, sharper, softer, harder, fatter, thinner, darker, clearer, harsher, duller, or to have more or less sound (the Greek εὐφωρία concept) than another, or vowels are compared to animal noises or other sounds occurring in nature (the sixteenth-century Germans). The bleating of Cratinus' sheep is almost invariably invoked for [ɛ] (e balans, Martin, 1632).

Very often only five vowel qualities are distinguished (Latin a, e, i, o, u long and short), though for some vowels a qualitative difference is noticed between the long and the corresponding short (Terentianus Maurus, Marius Victorinus, Servius).

The first Icelandic Grammarian adds four Umlaut vowels (blendings), and makes phonemic distinctions between long

and short oral and nasalized vowels. Nasalized vowels in French are beginning to be noticed in the sixteenth century.

Leonardo da Vinci mentions raising of the larynx in [u], but fails to distinguish between [e] and [ɛ], [o] and [ɔ] in Italian. Trissino, 1524, distinguishes them as 'chiuso' and 'aperto', and proposes distinctive symbols for them, and Meigret, 1545, is the first of the French writers to operate with the terms 'ouvert' and 'clo(u)s' with reference to the two e's and o's. (Cooper, 1685, uses 'close, middle and open' to describe tongue-height in his 'lingual' and 'guttural' vowels, but he does not indicate the position of the tongue in 'labial' vowels any more than do Wallis and Wilkins. The latter (Essay, p. 360) does mention a 'concave posture long ways for [y], and degrees of 'apertion' for all his vowels, including the labials (p. 374), but the tongue - position for the labial vowels is not shown in the pictures on page 378). Some French writers, e.g. Meigret, Péletier, and Rambaud, have more than five vowels. German writers like Ickelsamer, 1527 and 1534, and Oelinger, 1573, add three Umlaut vowels to the traditional five. Oelinger calls a, o, u mutabiles, because they can be umlauted to ä, ö, ü. Bullokar, 1586, too, has eight vowels, and makes statements about length.

Madsen has [a], [e], [i] (lingual), and [u], [o], [ɔ], [y], [ø], [œ] (labial), but does not distinguish between back and front rounded vowels.

His 'lingual' and 'labial' are Hebrew categories, which

replace Ramus' *vocales diductae* and *contractae*.

Robinson, 1617, does extremely interesting work along the horizontal axis, but completely ignores tongue-height and lip-position. His short and long vowels, having 'their passage through certaine short' and 'somewhat longer organes', respectively (Dobson's ed., pp. 14 f), are slightly reminiscent of Fabricius ab Aquapendente's acute and grave vowels caused by 'narrowness and shortness, and width and length', respectively, of 'the channel of the pharynx' (De Locutione, 1600, p. 14).]

If, for the moment, we ignore the steady j's and w's, one possible interpretation of Montanus' vowel descriptions will yield the rather surprising arrangement shown on page 168. Before laughing this system out of court, we should bear in mind that Montanus is not trying to present us with an inventory of his vowel phonemes.

He makes it quite clear that this is meant to be a list of the various vowel qualities that he is able to distinguish.

It should be added, however, that in including or excluding items from his list he is sometimes guided by phonological considerations and sometimes not. Thus he decides not to discuss the throat vowels in detail (M. pp. 50 and 160), because their substitution for root vowels fails to bring about a change in the meaning of language-words, and their two genera may, therefore, be combined with the root vowels into one genus. (Cf. his similar remarks on page 73 on the lip vowels, and pages 160 ff on [ɛ] and [e].)

|                   | Root     | Inner Middle | Middle | Alveolar | Dental | Lip                |
|-------------------|----------|--------------|--------|----------|--------|--------------------|
| Flat              | [ɑ], [a] | [ɛ]          | [e]    | [ʌ]      | [i]    | [y], [ʌ], [y(u)]   |
| Moderately hollow | [ɔ]      | [ɔ+] or [œ-] | [ø]    | [y]      | [y+]   | [y+], [ʌ], [y+(u)] |
| Hollow            | [o]      | [u+]         | [u+]   | [y+]     | [y+]   | [u]                |

On the other hand the hollow alveolar and dental vowels (p. 69), though not 'necessary' and distinctive, are included as 'special letters', because they allow him to fill two boxes which would otherwise have remained empty. It is also significant that these two vowels and the hollow inner-middle letter (p. 59) have given him (and us) more trouble than any of the others, because he has had to find Dutch examples for them, forgetting that he is supposed to be writing a handbook of general phonetics.

These highly problematical and, indeed, suspect, vowels underline the fundamental error in Montanus' system, viz. its a priori nature.

On page 59 he tells us that as there is a genus of flat and one of moderately hollow inner-middle letters, reason has taught him that there must be and can be a genus of hollow ones as well, and after much thought he has hit upon the Delft variant of [u]. Similarly, on page 69 we learn that reason has shown him the way to the hollow alveolar and dental vowels. As there are flat and moderately hollow alveolars and dentals, and as hollow vowels occur at other 'depths', there must be hollow ones at these points. And as there are flat, moderately hollow, and hollow vowels at all 'depths' of the inner mouth, there is no reason why they should not be found at the outer mouth or lips as well (p. 73).

It would be gratifying, if one of the uses or 'fines minus

principales' of the study of the history of phonetics could be to induce modern phonologists to take warning from this and similar crude examples of neat-and-tidy system building.

One out of many things that strike us about Montanus' arrangement is the preponderance of rounded vowels, viz. six rounded close front vowels, and three rounded close back ones, and we may justly reproach Montanus for noticing diaphonic and contextual variation in these categories and not in others. With the help of the data provided by the techniques of comparative philology and a knowledge of Pres. Du. vowel qualities it can easily be shown that hollow inner-middle [u•] and hollow middle [u•+] are contextual variants of the same phoneme, and Montanus himself tells us (p. 59) that [u•] is a regional, and perhaps social, variant of [u]. [If those who ridiculed the people of Delft for using Montanus' hollow inner-middle vowel instead of [u] (M.p. 59, above p. 155) were 'the best speakers', it seems likely that they also had a different vowel for Montanus' hollow lip [u] (M.p. 72, above p. 160) with which Montanus equates their reflex of Gmc. pre-velar/labial  $\bar{o}$ , since the two have different origins and are distinct in the Standard language to-day ([u] and [ɔu]), unless we assume that they had coalesced by Montanus' time and that contextual difference subsequently gave rise to a fresh phonemic split.]

Lip [u] in many cases is a diaphonic, and sometimes a free variant of flat and hollow [y(u)] (M.p. 73), which themselves are diaphonic variants of each other, and contextual variants of [y•], of which [y] and [y•] are also contextual variants, and [y•] and [y•+] individual or perhaps group variants.

Similarly, [ɛ], when long, is a social variant of [a], as we know from other sources (see Hellinga, 1938, pp. 304 ff); when short, it is a variant of [e] before [r]. And [ɔ+], of which only the short or snap type occurs in Montanus' speech, is a regional variant of [ɔ] and [ɛ] before [r], and hence of [e].

As it further appears that 'long' [ɛ] at any rate before [r] + [d] or [t] may vary with 'long' [e]<sup>16</sup> (M. pp. 161, 163) as well as with [a], it looks as if in a phonemic system based on Montanus' phonetic analysis [ɛ] could be dispensed with. [Note that what was, probably, phonetic [ɛ] then as now, was looked upon by Montanus as short [e] (M. pp. 105, 161).

Dobson, I, 277, observes that 'to a Dutchman (Lodwick) the qualitative difference between English [e] and [ɛ:] would be very clear, as his own short [ɛ] is markedly more open than English [e]'. As a matter of fact it takes a phonetically trained Dutch ear even to be able to tell the difference between English [e] and [æ], since [e], [ɛ] and [æ] may all occur as realizations of the Dutch /ɛ/ phoneme.]

When these eliminations have been made, we are left with a more manageable system, which is easily recognizable by students of historical Dutch phonology.

We can see from it, among other things, that in early seventeenth-century educated South-Holland speech M.Du.  $\bar{u}$  had not yet been diphthongized, that M.Du.  $\bar{y}$  (except in some words) was not yet a diphthong either, but that there was a noticeable difference between  $\bar{y}$  before r and  $\bar{y}$  in other

positions.

We also learn from it that Pres.Du. [i] was different from what it is to-day, and that M.Du.  $\bar{o}$  and  $\bar{e}$  had not yet coalesced<sup>17)</sup>.

However, it is not, on the whole, due to Montanus' analytic and descriptive powers that we can establish these and similar interesting facts. It is from his comparisons with foreign sounds, doubtful though some of these are in themselves, and the clues that his spelling provides rather than from his ingenious classificatory categories that we can arrive at an approximate identification of some of the items in his system. These items furnish us with reference-points with the help of which we can obtain a rough idea of the rest of the system, and in many cases it is only by adding the time-perspective that we can make sense of Montanus' statements at all. The classificatory scheme is surprisingly modern in itself, but his handling of it is sadly disappointing. His system is, in fact, the well-known modern three-dimensional one, taking into account as it does, vertical as well as horizontal tongue-position, and lip-position. Although he looks upon the latter as accidental rather than essential, he never fails to mention it in his descriptions of the various vowels, though his initial statement to the effect that flat forms have loose lips, moderately hollow ones moderately contracted lips, and hollow ones closely contracted lips would have sufficed.

It is clear from what he says on page 41 f (see above, 5.4, p. 124) and in many other places (e.g.M. pp. 55 and 69) that

in addition to being auditory concepts 'flat', 'moderately hollow', and 'hollow' represent three degrees of height of the tongue, viz. high (or close), mid, and low (or open), respectively.

The number of points along the horizontal axis is more than adequate for dealing with the vowels. It is in the application of his categories that he goes sadly astray. As it stands, the scheme shows us a horizontal row of unrounded vowels (except the one on the extreme right, which is rounded, because its dividing-door is at the lips), a horizontal row of moderately rounded vowels and another row of closely rounded vowels.

Up-ending the whole thing, so that the top row becomes the left-hand column, would be a decided improvement, provided that the resulting left-hand column is looked upon as a series of front vowels.

[ɑ], which would then be at the bottom, would certainly have to go, and [ɻ] at the top would also have to find a slightly different place.

The moderately hollow vowels would not cut such a poor figure as an upright row in the middle, as long as they were interpreted as rounded front vowels. Of course there would be no excuse for [ɔ] at the bottom. The hollow ones, **unfortunately**, would still make a sad show when tilted into back-vowel position. [u] at the top would be the only satisfying feature of such a row.

It is interesting to see that Caron, (1947, pp. 107 ff) unconsciously interprets Montanus' vowel system in a way which is rather similar to the one suggested above. On page 107 he tells us that in the vowel system as printed by Montanus on page 105 (for my notation of it, see p. 168 above) the left-hand column, made up of [a], [a] at the top, [ɔ] in the middle and [o] at the bottom, shows the open vowels, and that the five columns to the right of it show increasing degrees of closeness as one moves from right to left.

On page 108 he says that in the table on page 60 of Montanus the order of Montanus' examples of [ɔ], [o], [u·] and [u·+] (in my notation) again shows an increase in closeness as one passes from one vowel to the next, with the exception of [ɔ] and [o], which Montanus considers to be 'both very open' (see also Caron, p. 109, fn.1). This happens to be true in the main ([o] is, of course, not an open vowel; one consequence of Caron's interpretation is that Montanus'  $\bar{o}$  must have been a much opener vowel than Pres.Du. [o], Caron, p. 109), but it is not what Montanus says, whatever he may have intended to say. (Cf. my own remark on [e] before [r] (M. p.54), above p. 151).

In Montanus' vowel scheme left means back, and right means front, while top means close and bottom means open. It is only by remembering this that one realizes how poor the arrangement is, however excellent the system. None of his hollow (i.e. open) vowels is really open. It is true, in the two tables

referred to above the enigmatic hollow alveolar and dental vowels do not occur, and if we could be quite certain that in the series [ɔ], [o], [u·], [u·+], [u] the fourth vowel is really a little closer than the third, we would be perfectly justified in interpreting Montanus' 'fronter' as 'closer' for this section of the system as well as for the top row. Unfortunately, we do not know how consistently Montanus misheard and misfelt closeness as frontness.

It is a curious coincidence that, while Caron feels inclined to interpret Montanus' 'back' and 'front' as 'open' and 'close', Dobson (I, p. 280) sees in Wilkins' 'distinction of 'concave' and 'convex' shaping of the tongue ... a new attempt to distinguish 'back' and 'front' vowels'.

I believe that Wilkins' 'more concave, less concave, somewhat convex, and more convex' for his lingual vowels *ɑ*, *a*, *e*, *i*, are comparable to Montanus' hollow, moderately hollow, and flat (or bulging) and refer to tongue-shape and, indirectly, to tongue-height. The pictures on page 378 of the Essay seem to bear this out, and the conjunction 'and' in his descriptions (pp. 360, 364, and 379) probably introduces appositional matter.

An interesting problem is raised by the absence of [ə] from Montanus' vowel system. Words containing [ə] in Pres.Du. are said to contain [e]. On page 54 'de' and 'wandelen' (Pres.Du. [də] and [vɑndələn]) are given as illustrations of snap [e] along with the 'first element' of the vowel in 'eer, een, cleet, ree'. In 'beëdicht' on page 48 (see above, p. 133) the prefix and the stem are supposed to have the same vowel.

On page 97 the difference between unstressed and stressed -er, -el, -en, -em, -ich, and -et is stated to be in the 'height' and the length of the consonants. No mention is made of a qualitative difference between the vowels.

(Pres.Du. has [ə] in the unstressed endings, [ɛ] in the stressed ones, except in -ich, where the vowel is [ɪ].

It should be remembered that Montanus analyses Pres.Du. short [ɛ] as [e], which varies with [ɛ] before r, see above p.151.)

With one exception the other early writers on Dutch pronunciation do not recognize [ə] either.

Sexagius, 1576, has short [e] in unstressed syllables. In all his examples it is followed by [r].

De Heuiter, 1581, has long [e] in the unstressed prefix ge-.  
Spiegel, Twe-spraack, 1584, p. 106, lists 'lepel, ene, ere, ete, elle, ewe, egge' (Pres.Du. [le·pəl], [e·nə], [e·rəl], [e·te], [ɛlə], [e·və], [ɛɣə] as palindromes. On page 107 'reghel' is said to give 'legher' when read backwards (Pres. Du. [re·ɣəl] and [le·ɣər]).

An almost identical list of 'Dictiones reciprocae' occurs in Van Heule, 1625/26 (Caron' ed., pp. 88 f).

Van der Schuere, 1612 (Zwaan's ed., p. 16) identifies unstressed e with short [ɛ] and the short of [e·].

Ten Kate, I, 1723, gives it as the short of [e·] (p. 116), but also equates it with the vowel in It. 'che', Fr. 'que', and (the unstressed syllable of) Germ. 'Angel'.

In the poem printed in his 'philosophical letters' (i.e. an 'organic' notation-system, one version of which is non-alpha-

betic) the same symbol is used for a large number of Pres.Du. [ə]'s and for the vowel in the words 'den, der, en,' which is usually [ɛ] to-day (Ten Kate, Aenleiding I, p. 130).

The French recognized [ə] in their language early in the sixteenth century. It is referred to as 'e féminin' by Pierre Fabri in 1521, and described by Dubois (Sylvius), who distinguishes three e's in French, in 1531 (exiliter (pronunciatur) et voce propemodum muta). He marks it with a grave accent, because 'the voice languishes in it, and seems to die' (Thurot I, p.37).

Péletier and Des Autelz protest against the absence of a distinctive mark for it in Meigret's reformed spelling of 1545 (Brunot II, p. 104). Des Autelz points out that it is usually called 'feminine e' and that it does not occur in other languages. He prefers to call it 'imparfait', 'pource qu'il ne semble avoir que le demy son de l'e, voire estre quasi une consonante' (Livet, p. 127). Péletier calls it 'e sourd' and uses a diagonally barred e to denote it (̸) (Apologi̸ a Louis Meigr̸et Lionno̸s, 1549; Dialogv̸e d̸e l'Ortograf̸e e Prononciation Fran̸coes̸e, departi an deus liur̸es, 1550). Meigret replies that it is a short close e.

Ramus uses ̸ for [ə] (Brunot II, p. 117), which is identical with Meigret's symbol for [ɛ]. Beza uses Péletier's ̸ and equates the sound with Hebr. shewa (Livet, p. 542).

Saint-Liens, 1580, calls it 'half-dead'. According to Thurot I, p. 38, the term 'e muet' (= e féminin, e de bas ton) was first used by an anonymous writer in 1654. Dangeau ('le père de

notre phonétique, Thurot II, p. 570) pointed out in 1694 that 'e muet' is an incorrect name.<sup>18)</sup>

German [ə] was probably first recognized under French influence.

Albert Oelinger, 1573 (ed. W. Scheel, p. 14) compares final e in 'lebe, sage, hause, Statte' with French masculine e as in 'cité', while the unstressed e's in 'den Herren Förchten ist die wurtzel der weiszheit' are compared with French feminine e in 'grace'.

The comparisons of Hebrew shewa with the rapid pronunciation of the vowel in the German prefixes be-, ge- referred to above (p. 102) probably furnish additional proof of the occurrence of [ə] in sixteenth- and seventeenth-century German.

In England Wallis, 1653, seems to have been the first to describe [ə].

Caron (De reductievocaal in het verleden, Groningen, 1952, esp. p. 14) concludes from the vowel-descriptions of Montanus, Ten Kate and the early Dutch orthographers and grammarians that there probably was no [ə] in seventeenth-century Dutch. It may be pointed out that Joas Lambrecht, admittedly in a description of a different type of Dutch ('Néderlādsche Spelljnghe, Ghent, 1550), uses Péletier's e barré to indicate what in Pres.Du. is [ə].

As Montanus confuses shewa mobile and Svarabhakti with syllabicness of consonants (see above, 5.5, pp.129 and 131), it seems likely that he simply failed to notice the existence of [ə]. Although he and Ten Kate were the most accurate observers among the early writers on Dutch pronunciation, it is not

surprising that their analysis was not in every respect superior to that of their predecessors and contemporaries. Forms like 't, 'k, which occur frequently in Montanus (and compare 'z'is' for 'zij (ze) is', M. p. 136) make it acceptable that [ə] was spoken (or elided) in these and similar words. On the other hand fronted and rather close realizations of the 'neutral vowel' occur as regional and personal variants in Dutch to-day, and I have heard [dɛ 'prɪnsɛ'χrɑxt] (de Prinsengracht) from Amsterdam tram-conductors.

However, as I have also heard the German prefixes be-, ge- pronounced [be·], [ge·] by educated Germans, this probably does not prove much.

In comparison with Montanus' vowel system, that of Wallis (1653) strikes the modern phonetician as far more realistic.

| Wallis              |          | Gutturales                | Palatinae    | Labiales     |
|---------------------|----------|---------------------------|--------------|--------------|
| Apertura<br>faucium | minori   | [ʌ]                       | [i(:)]       | [y:]         |
|                     | mediocri | [ə]                       | [e(:)]       | [u(:)]       |
|                     | majori   | [ɑ:], [ɒ(:)]<br>or [ɔ(:)] | [a],[æ],[ɛ:] | [ɔ:] or [o:] |

It has at least some of the vowels in what are now considered to be the right places. However, the theory behind it is less satisfactory. It is not a three-dimensional system like that of Montanus. As Dobson (I, p. 227) correctly points out, lip-rounding is made alternative to tongue-position, which, moreover, is only indirectly recognized in terms of degree of oral aperture.

The labiales are produced at the lips. The differences between them are supposed to be brought about by the different degrees of contraction of the lips; tongue-position is not considered at all in the labiales. Though Montanus' practice is inferior to Wallis's, his theory is decidedly more like that on which the Bell - Sweet system is based.

The systems of Wilkins (1668) and Cooper (1685, 1687) are two-dimensional like Wallis's, by which they were clearly influenced. They both have Wallis's three horizontal places. Wallis's palatinae are Wilkins' and Cooper's linguals (or lingua-palatae in Wilkins). Wilkins has four degrees of tongue-height in the linguals, three degrees of lip-contraction in the labials, and there is only one guttural, in which tongue and lips are inactive.

Cooper, like Wilkins, has four degrees of tongue-height in the linguals, two degrees of lip-contraction in the labials and two gutturals, for one of which the tongue-position is described (in some places it is referred to as the openest of the linguals, see the diagram, Sundby, p. 22a), while the other is said to be 'the fundamentum of all vowels' and made 'only in the throat' ([ʌ] or [ɤ] and/or [ə]).

Dalgarno, *Ars Signorum*, 1661, recognizes only two horizontal categories: gutturales and labiales, the former with four degrees of opening (described partly in auditory terms), the latter with three degrees of labial contraction. (See O. Funke, *Zum Weltsprachenproblem in England im 17. Jahrhundert*, p. 96.)

Amman (1692 and 1700), who criticizes Wallis for his trichotomous division (letter written in 1700 and printed in the 1727 edition of Wallis), has the same three horizontal categories as Wallis, but calls the palatinae dentals. His only guttural is *a*, which can be pronounced with the tongue in a number of different positions, but it is usually and most conveniently pronounced with the tongue in its position of rest. Sometimes *a* is heard *apertum*, more *o*-like.

The dentals are *e*, *i* (long and short), and *j*. For *i* the teeth are closer together than for *e*; *j* is not a consonant, but a rapidly pronounced *i*. The labials are *o*, *u*, and *w*, which are all pronounced with the tongue and teeth in the position for *a*, but with different degrees of labial contraction.

There is the same relation between *u* and *w* as between *i* and *j*. In addition Amman has three *vocales mixtae* (a term also occurring in Reyher, 1679, see below), viz. the German unlauded vowels *ä*, *ö*, *ü*, or French *ai*, *eu*, *u*, which have the lip-positions of *a*, *o*, *u*, respectively, but the tongue- and teeth-position of *e*.

By far the most satisfactory seventeenth-century vowel system is Holder's, 1669.

It has two main places of articulation along the horizontal axis, viz. palatic and guttural, corresponding to front and back in modern terminology, but recognizes degrees of frontness in the former (Elements, pp. 85 ff). Like Montanus, Holder rejects the concept of labial vowels, i.e. vowels produced at the lips (pp. 84, 86, 89). All vowels can be pronounced

'with the end of the tongue against the teeth' (presumably the lower teeth), and all of them 'without altering the posture of the lips' (p. 84). There is no labial vowel. Labial action may be added to any vowel (p. 89). The o in 'cole' is not a labial vowel, because 'it receives not its Articulation from the Lips' (p. 86). Holder recognizes various degrees of aperture. In a, a, e, i 'the straitnings ... are gradually both forwarder and nearer the Roof' (p. 87). His system provides for voiceless and nasalized vowels (nine articulations applied to four sorts of matter: breath-oral, breath ore-nasal, voice-oral, voice ore-nasal, p. 97) and lax and tense vowels as well (p. 91).

The only objection that might be raised against the theory of Holder's system is that it lacks central vowels. His practical treatment of the guttural vowels is less successful than that of the palatic, but on the whole Holder's vowel analysis, both in theory and practice, is far superior to Montanus' and Wallis's.

He was fully aware of the extreme complications involved, witness his remark on page 83: 'he that can describe them (i.e. the vowels) accurately, erit mihi magnus Apollo.'

Ten Kate, 1699, arranges the vowels of Dutch in the following order: [i], [ɪ], [e], [ɛ], [a], and [ɑ], [ɔ], [o], [œ], [ø], [y], [u], in which there is 'progressive lowering and retraction of the tongue'. By the 'the tongue' he probably means 'the front of the tongue', for in one place he says that in [u] the distance between the tongue and the palate is greatest (Van der Hoeven, p. 72), in another that [u] has the greatest

narrowing at the back of the tongue (Van der Hoeven, p.71) (cf. Isaac Newton, c. 1660, who, on p.4 of the notebook discussed by R.W.V. Elliott, *Modern Language Review*, xlix, pp. 5 - 12, states that the front of the tongue is progressively drawn back in passing from [i] to [u] with increasing narrowing at the back of the mouth. Newton, however, does not mention progressive lowering of the front of the tongue). Ten Kate adds that from [ɔ] onwards there is approximation of the lips (1723, 'gradual closure of the lips'). He also notes (Van der Hoeven, p. 72) that [i] has 'the highest resonance' and that there is successive lowering of the resonance (presumably meaning formant 2) in passing from [i] to [u].

Van der Hoeven (p. 108) believes that Ten Kate was the first to point out the 'resonatory action of the oral cavity', but Samuel Reyher (*Mathesis Mosaica*, Kiel, 1679) had already arranged the German vowels in an ascending series according to their 'inherent pitch in whisper'. His order is: U, O, A, Ä, Ö, E, Ü, I (G. Michaelis, *Über die Anordnung der Vokale*, *Herrigs Archiv*, XXXV (65), 1881, p. 422).

In the sections dealing with the vowels Montanus takes great pains to show that those represented in traditional orthography (and in his notation, which is based on contemporary Dutch orthography) by digraphs should not be analysed as diphthongs. On pages 54, 57, 60, 65, 67, and 68 he draws up lists of arguments to prove that ae [ɛ], eu [ø], oę [u·], oe [u·+], ie [ɪ], ue [y], ui [y+] are monophthongs. These lists vary in length, but recurrent features in them

are the fact that these vowels can be felt to be pronounced with one form from beginning to end, i.e. without altering the shape of the mouth in any way during their production, that this uniformity from beginning to end can be heard<sup>19)</sup>, and that it can be seen. ue ([y:], see above, p. 157), for instance, has contraction of the lips throughout; if it consisted of u and e, the lips would be loose during the latter part (p. 67).

In the case of eu [ø], (p. 57) he points to the variant spellings, eu and ue. If it really consisted of e and u, this difference of opinion among writers would not have been likely to arise. A similar proof is derived from the diversity in the spelling of [y:] (ue, uu, uy) (p.67). Another argument is taken from children's spellings (p. 58).

A most unconvincing argument for the monophthongal nature of oe [u.+] is that the Westphalians, who say 'doe' for 'duu'<sup>20)</sup> do not think they are using a diphthong there (p.60).

An additional proof of the monophthongal nature of moderately hollow alveolar ue (= [y:]) is that the sound does not lengthen with -wen, nor with -jen, but with -n. If it ended in u, it would take -wen, if in j, -jen (M. p. 67).

This is a very strange argument, apparently taken from the name of the letter. What he means is that stems ending in a diphthong with [u] or [i] for their second element are followed by inflectional endings of the type [wən] and [jən], respectively (cf. Zwaardemaker and Eijkman, p. 153; Eijkman, 1937, p. 75).

As this sound ([y:]) is always followed by [r], the question does not arise. The one example taken from his own type of Dutch in which it is not followed by [r] probably does not belong here, but should have been grouped with the moderately hollow dentals (Pres.Du. [œi]). (The word 'zuet' is taken from a different dialect.)

Montanus continues: w and j, being of a lower degree than r, may not stand within (i.e. before) r in a syllable, and this sound is usually followed by r, e.g. 'zuer'.

[In other words, [r] following [j] or [w] (i.e. [i] or [u] as the unstressed element of a falling diphthong) would cause a syllable peak (cf. M. p. 84, where 'dejr' is said to be disyllabic; see below, Chapter X).]

(M. p. 68) The moderately hollow dental ui (= [y+]) is not two u's, as the spelling 'wt' for 'uit' might suggest, because it does not lengthen with w, e.g. 'lujen, kruijen'. It is not two ij's (i.e. [i·]'s) either, because there is contraction of the lips throughout.

He cannot add that it does not lengthen with j, because from his examples it appears that it does.

Notes to Chapter VII

- 1) Cf. The Principles of the International Phonetic Association, 1949, pp. 8 f.
- 2) Montanus' 'snap' is reminiscent of the terms in which the sixteenth-century German writer Ickelsamer negatively defines 'free contact', 'wa man den laut lang vnd wol dehnet, vnd nit bald dauon abschnapt ...' (See Jellinek, II, p. 37).
- 3) Verschuur rejects this on page 100 of his monograph, but accepts it on page 102. Caron, 1947, p. 112, accepts an open o. Cf. Caron, p. 49: 'a long open o (as in Eng. law? or laugh?)'.
- 4) No such distinction is mentioned by contemporary French writers (Verschuur, p. 106).
- 5) Sexagius, 1576, who describes a Brabant dialect, has what he calls 'the diphthong eu' in similar words. Montanus' symbol is eü.
- 6) Cf. Kruisinga, 1924, p. 10; Eijkman, 1937, p. 74; Schönfeld, p. 78; L. Kaiser, *Lingua* I, 1948, p. 303.
- 7) Spieghel, 1584, pp. 16 and 22, also says that 'y has the double sound of i' (cf. Van Heule, 1633, p. 8, ed. Caron).

- 8) Before [r] Pres.Du. 'long' vowels are really long.
- 9) Ancient Greek short ypsilon is usually pronounced [æ] by the Dutch. The Dutch name of the letter is ['æpsilon] or ['ɪpsilon]. Of course, Montanus' pronunciation of the modern [æ]-words may have been different.
- 10) Lodwick, 1683, like Montanus, analyses Du. ij, ui, and ou as monophthongs. Dobson I, p. 277, thinks that Lodwick is wrong.
- 11) Notice his loose use of the terms 'genera' and 'species'.
- 12) It would take a highly trained ear to hear the difference between the three [u]-elements of the diphthongs and between the three initial [w]'s.
- 13) His examples for the latter are 'the first ground-letter in ... Schout/ic dou indicated by o'. If this is the noun 'schout' (it is spelt with a capital), it is an example of Montanus' [ɔu], the first element of which he doubtfully assigns to the moderately hollow lip vowels. (The noun 'Schout' belongs to the same group of words as 'oud', 'hout', etc., where [ɔu] developed from -al- or -ol- before d, t, cf. Schönfeld, p. 68).
- If it is a verbal form, it provides an example of a hollow lip vowel, like 'ic dou'. This is less likely, however, as in that case Montanus would probably have written 'ic schou/dou' instead of using the 3rd pers.Sg. form for the former. Both Montanus' [ɔu] and [u·] are Pres.Du. [ɔu].

- 14) Cf. Van der Schuere, 1612, ed. Zwaan, pp. 29 and 67.
- 15) V and w are both bilabial. The difference is that v is a 'rustle-sounder' or 'broad rustler', i.e. it has friction, while w is organically a vowel, which functions in the syllable as a consonant, i.e. phonetically it is a vowel, phonologically a consonant.
- 16) Cf. Ten Kate, 1723, I, p.116.
- 17) Most of the sixteenth- and seventeenth century Dutch grammarians and orthographers distinguish between the two  $\bar{o}$ 's, as also between the two  $\check{o}$ 's, and many of them indicate the difference by using diacritics or distinctive symbols.
- 18) Of course, many Modern French written e's are really 'muets'. The use and distribution of [ə] in French is a highly complicated subject which deserves 'prosodic' treatment (cf. J.R. Firth, Sounds and Prosodies, Papers in Linguistics, p. 131).
- 19) Cp. Sextus Empiricus' argument against *at*, *et*, *ot* being diphthongs (Adv. Gramm., 116 - 118).
- 20) This Westphalian pronunciation is also mentioned by Erasmus, 1528, and Spieghel, 1584.

CHAPTER VIIITHE DIPHTHONGS

Chapters XVIII - XXIII of 'The Art of Speech' deal with the double (= multiple) letters, i.e. double, triple, and quadruple letters, some of which will be seen to be diphthongs. (M. p. 95) Double letters have more than one letter-ground, i.e. they are composed of single letters.

The double letters proper can be of one form or of two forms. Those of one form are the long letters. They can have two ways of breathing or only one.

Those that have one form and two ways of breathing consist of a free snap sounder and a free steady sounder. The steady sounder may follow or precede the snap sounder.

Those in which the steady sounder follows are the long vowels discussed above.

(p. 96) Some of these double letters have special names among the Greeks and Hebrews.

Greek Omega is Montanus' oo, Etha is his ae. Hebrew Holem is his oo, Camets is ֶּוּ, Chirec is חֵי or ie, Tsere is ee or ae, Schurec is ou.

The steady + snap long letters are ji, jüi, jüoi, wu, wü, wöu (= [ji], [jỵ], [jỵ+], [wä], [wä+], [wu], which may be conveniently grouped together under ji and wu.

The long letters of one form and one breathing are the double consonants (hh, rr, ll, zz, dd, pp, etc.). They are steady throughout.

It should be noted that words like 'gae, rĳ, blĳ, kóu, rou' end in double (or long) steady sounds. They should really (p. 97) be written 'gaaa, rĳĳ, blĳĳ, kóww, roww'.

[ Long vowels or diphthongs are longer in word-final position. They are really triple letters consisting of a snap sound and two steady sounds. The steady sounds have consonantal function, see below, Chap. X.)

Letters with double forms may have one or two ways of breathing. The one-breathing two-form double letters include the duplices consonantes, e.g. ks, ps, and the free sounders wr-, -rw, -rj. The one breathing is steady.

Those with two ways of breathing may be snap + steady or steady + snap.

(p. 98) In the snap + steady two-form double letters the steady sounder is nearly always either j or w. There are five ending in j (tooth-ending), viz. aj, ój, ej, euj, őej [ai], [ɔi], [ei], [øi], [ui]) and four ending in w (lip-ending), viz. aw, ów, ew, euw ( [au], [ɔu], [eu], [øu]).

aj, ej, aw, ew are flat; ój, euj, ów, euw are moderately hollow; őej is hollow.

ew and euw do not occur in Holland, but in Brabant ew is used for uuw ([yu]), e.g. in 'uuwe',<sup>1)</sup> and the High Germans, Romans and Greeks pronounce euw or ew in 'teutsch, euge, Europa, Deuteronomium',<sup>2)</sup>.

The transition in four of these nine, viz. aj, ój, őej, and aw, is so wide that they are triple rather than double letters.

Brabant speakers have another diphthong, viz.  $\text{aej}$  or  $\text{ej}$  (=  $[\text{ei}]$ ), which they use instead of  $\text{ij}$  (=  $[\text{i}^{\cdot}]$ ). North-Hollanders use  $[\text{ei}]$  where we have  $[\text{ei}]$ .<sup>3)</sup>

There is one snap + steady two-form double letter which does not end in either  $\text{j}$  or  $\text{w}$ , viz.  $\text{ea}$ , used by the common man instead of  $\text{ee}$  (=  $[\text{e}^{\cdot}]$ ), as in 'zeap, kleat', for 'zeep, kleet'. It is also much used by the English, both in speech and in writing, as in 'great, Godhead'.<sup>4)</sup>

On page 106 'nean' for 'neen' is given as a Schiedam form.

The table on page 98 is designed to show the number of possible tooth-ending and lip-ending snap + steady 'two-sounders' (= diphthongs). The root or throat-ending ones have been omitted.

(p. 99) There are twice eighteen places in all, but twenty-six of them are empty, because Montanus has not been able to find examples of two-sounders to fill them with. The ten places filled contain the nine diphthongs discussed above and the Brabant/North-Holland  $\text{ei}$ .

In addition, under each genus there are three places not counted among the thirty-six and indicated by o. These six places would have to be filled by the single-form (snap + steady) letters  $\text{ij}$ ,  $\text{ui}$ ,  $\text{uoi}$ ,  $\text{uw}$ ,  $\text{úw}$ ,  $\text{ow}$ , i.e. the three dental vowels and the three lip vowels discussed under the long vowels (see above, Chapter VII).

The steady + snap two-form double letters are the above reversed, viz.  $\text{ja}$ ,  $\text{jé}$ ,  $\text{je}$ ,  $\text{jó}$ , etc. and  $\text{ju}$ ,  $\text{wi}$ ,  $\text{jo}$ ,  $\text{wo}$ .

For these, too, there are thirty-six places.

However, as there are snap + steady two-sounders ending in steady aa [a·], there may be steady + snap two-sounders opening with steady [a·], whose symbol is h. [ On [h] as a steady vowel, see below, Chapter IX.)

The table on page 104 displays the possible triple letters. It does not contain any illustrative words.

Triple two-breathing one-form letters are snap + steady, aaa, eee, etc.; steady + snap jji and wwü; steady + snap + steady jij, wuw.

Triple two-breathing two-form letters may be snap + steady or steady + snap, both of which types may either end long or begin long. Snap + steady examples of the former type are aij, eij, eij<sup>5</sup>), óij, ěuij (tooth-ending), and aww, eww, óww, ěuww (lip-ending).

Snap + steady examples of the latter type are aaj, aej, eej, and aaw, aew, eew, etc.

Steady + snap examples of the former type are jaa, jae, jie, etc. and waa, wae, wee, etc.

Steady + snap examples of the latter type would be jja, jję, etc., wwa, wwę, etc., but they are not used distinctively.

Triple two-breathing two-form letters can also be steady + snap + steady, such as jaj, jij, waw, wew.

Two-breathing three-form letters are the 'Triphthongi', of which the snap-opening eaj and eaw are used. Others, such as ajw, ejw, are not in use. Steady-opening two-breathing three-form letters are waj, wej, etc. (tooth-ending) and jaw, jew, etc. (lip-ending).

On page 105 single, double and triple letters are contrasted in words.

'Een gat, hy gaet, ic gaa' illustrate single a, one-form double aa, and one-form triple aaa, respectively.

'maai, hooi, meui, blaaw, blaew, leew, niew are examples of two-form triple letters. In all the examples (except in 'geboeit') the triple letters are word or syllable final.

(p. 108) Quadruple letters, such as jouw, weij, weew, jaaa, jooo, weee are ground-letters which are matter of the four-letter-grounds of syllables.

Their names are their own sound, or the names of their single letters. For instance, weew may be called 'wéew' or 'uw-ee-ee-uw'.

(p. 109) The exact number of letters in multiples is often not so important. The meaning of language-words is not altered, whether we say jij or jijj, aa or aaa, etc., aj or aij, ej or eij, aw or aww, aaw or aaaw, etc.

Therefore, those in which the number of letters may vary should be arranged under a low genus.

On page 110 Montanus prints a table of all his double (= multiple) letters, in which some of the traditional terms, used intelligently, are added to his own. Thus the vocales longae are the one-form steady-opening or snap-opening double and triple sounders.

The Diphthongi have two forms. Those which are snap-opening and short-opening, like aj and aw, aij and aww, are propriae.

The snap-opening and long-opening, like aaj and aaw, are impropriae.

The steady-opening diphthongs are ja, jja, jaa, jaaa, wa, wwa, waa, waaa, etc.

Triphthongi have three forms. The snap-opening in use are eaj, eaw. Examples of steady-opening triphthongs are waj, waij, wwaj, jaw, jaww, jjaww.

Four-form letters (Montanus does not use the term tetraphthongi<sup>6</sup>), like weaj, jeaw, are all steady-opening and not much used.

[The Pres.Du. diphthongs listed by Kruisinga, 1924, p. 10; Zwaardemaker and Eijkman, 1928, p. 152; Eijkman, 1937, p.73; Blancquaert, 1953, p. 87, are [ei], [ou], [æi], [ai], [oi], [ui], [eu], [iu], [yu].

Van Wijk, Phonologie, 1939, pp. 28 f; Van den Berg, 1960, p. 46; Cohen, Ebeling, Eringa, Fokkema, Van Holk, 1959, p. 25, all look upon [ei], [ou], [æi] as monophonematic and analyse [ai], [oi], [ui], [eu], [iu] as combinations of two phonemes of which the second is a consonant (j, w).

They all agree in not mentioning [yu].

The prototypes of all these diphthongs or alleged diphthongs are mentioned by Montanus. Pres.Du. [ei] corresponds to his [ei], [si], and [i·]; Pres.Du. [æi] to his [øi] and [y+]; Pres.Du. [ou] to his [au], [ou] and [u]; Pres.Du. [oi] to his [çi].

[ai] and [ui] seem not to have changed much since his time.

Pres.Du. [yu] is his snap + steady flat lip vowel.

Pres.Du. [eu] and [iu] occur in his table on p. 105 as two-form

triple letters in final position.

Apparently the first element of [eu] in 'leew' was longer than that in Brabant [eu].

Smith, Hart, Newton and Wilkins, like Montanus, look upon combinations of [j] and [w] and a following vowel as diphthongs, and of [j] and [w] and a following diphthong as triphthongs (cf. Sievers, Grundzüge, 5th ed., p. 167 on rising-falling and falling triphthongs; on the interpretation of [i] and [u] following the stressed vowel in diphthongs as [j] and [w], see below, Chapter X).]

Notes to Chapter VIII

1) According to Verschuur (op.cit., p. 155) [eu] still occurs in Brabant in cases where Standard Dutch has [yu].

2) Spieghel, Twe-spraack, 1584, p. 36: eu (diphthong) occurs only in foreign words, such as 'Europa, Euphrates, Euripides, Eusebius, Deuteronomium, Hóóghteutsch'.

3) Brabant [ei] for [i·] is mentioned by Erasmus, 1528; Sexagius, 1576; De Heuiter, 1581; Spieghel, 1584. Present-day Standard Dutch has [ei] for Montanus' [i·] and [ei].

4) Gil, 1621, p. 32, and Wallis, 1653, p. 9 mention a diphthongal pronunciation of ea in the north.

5) The table is full of misprints, but this is what is intended.

6) This term seems to have been invented by Oelinger, 1573.

CHAPTER IX  
THE CONSONANTS

The fricatives, being 'free letters', are treated along with the vowels on pages 50 - 75 (Bk.II, Chaps. VIII - XI), the liquids or 'hindered letters' on pages 75 f (Chap. XII), the nasals on pages 77 - 79 (Chap. XIII), the plosives or 'chokers' on pages 79 - 82 (Chap. XIV). The 'double' consonants are dealt with along with the 'double' vowels on pages 95 - 111. (Chaps XVIII - XXIII).

(M. p.50)

The throat vowels can be freely substituted for the root vowels without affecting the essence and meaning of the words in which they occur (see above, pp. 148 f).

The throat rustler (h), however, could not be used instead of a root rustler or rustle - sounder. These letters have to be kept distinct both in speech and in writing. 'Cheer' ([xe:r]) could not be used instead of 'Heer' ([he:r]), nor 'chy' ([xi·]) instead of 'hy' ([hi·]).

Montanus has long pondered about the nature of [h]. He says: I thought the root letters were the Gutturales and the deepest (as regards length of the forms), not suspecting that there (p. 51) is another and deeper row of letters. Therefore, I thought that h was a steady free roof letter, identical with steady aa, ae, ee, óó, oo, etc., just as j and w are steady ij and uu, etc. That would make h a steady e in 'hemel', o in 'hol', a in 'halm', etc., with a less powerful sound than when it follows a snap vowel. (It is in the nature of initial sounds to be less powerful than final sounds.) But then I

realized that there is a genus of throat letters, and I find the idea that h is a throat rustler more attractive. Its noise is softer than that of the other rustlers and tends a little more towards sound (i.e. voice) and that is because of the depth of its rustling-hole. The noise loses some of its sharpness on its long way from the throat to the lips and assumes a certain smoothness<sup>and</sup>/softness; ch is also a little softer than the other rustlers.

But h is not always a rustler, often it is a rustle-sounder. One must not think that it is impossible for rustle and sound (i.e. noise and voice) to come out of the throat at once. It is possible to whistle and make a blowing noise with the lips at the same time. This can be heard and felt. Partial stopping of the breath at the lips, which produces noise, can be combined with the smooth passage required for the whistling sound.

I will not completely reject my original theory that h is a steady roof sounder; h sometimes has the nature of both a steady roof and throat sounder.

Traditionally h is supposed not to be a letter, but only an aspiratio, that is, a blowing or breathing, because the Greeks do not use a marking-letter (= symbol) for it (though at one time they did), but only a half o over the free snap letters. If h is an aspiration, it must be a letter, too. Otherwise s, f, etc. would not be letters either, and even those who call them mutes consider them to be letters. Aspiration would have better claims to the name of letter than something mute ('een Stom-heit').

The fact that the Greeks have no proper symbol for it does not deprive it of the nature of being a speech letter. (p. 82) So many speech letters have no symbols. The Hebrews write points for the vowels, which nevertheless are letters. Speech letters do not depend for their existence on symbols. It might be argued that h is too short to lengthen a syllable to which it is added. This is only partly true, and the argument is not strong enough to exclude h from the list of letters. It is short, but it is heard. It is short, because it usually precedes a free snap sounder, and all free snap sounders receive their sound (i.e. voice) in the throat, and, therefore, h and the snap sounder are more closely united than other letters, there being no cleaving part between the two which might make for length.

It also combines easily and closely with the rustlers<sup>1)</sup>, as in Greek θ, χ, φ, because, although the essence of their sound is not in the throat, the breath, their matter, comes from there.

Montanus proposes to replace the traditional name of the letter ('haa') by 'hee'. 'Haa' and 'kaa' (for k) are confusing names. As the names of so many other letters end in -ee, children tend to add the -aa to h and k in writing, when these letters are spelt to them. He noticed this while teaching his child. Although the other rustlers have names beginning with ee (= [ɛ]), 'hee' is an appropriate name for h, because it is nearly always syllable initial and it is

related to the rustle-sounders, which have names ending in -ee. In fact, it often is a rustle-sounder.

In the Appendix (p. 160) Montanus confesses that in the body of the book he has mistakenly tended to assign to the throat in general what belongs to the larynx in particular. In most places where the word 'throat' occurs the reader should replace it by 'larynx'.

He also says he now believes that 'our h' is more usually a 'broad' larynx rustler than a 'narrow' one (see above, 5.3, pp. 118 ff). It is narrow in 'thout, 'thebben', etc.

The symbol h is used for both the broad and the narrow larynx rustler (Inl. p. 20). The glottal stop (on which see below) is identified as a larynx 'choker'. He believes that Hebrew 'Hcheth' and 'Nhain' are uvular, but is not sure whether 'Hcheth' is a free uvular rustler, whether it is 'broad' or 'narrow', and whether 'Nhain' is a uvular nasal or a 'broad free uvular rustler'.

The symbol for the broad uvular rustler is hg, because its place of articulation is intermediate between h and g (= [ɣ]). Another symbol for it is ḡ<sup>2</sup>.

For the narrow uvular rustler he provides two symbols, viz. hch and ḥch. (Inl. p. 20) Similarly the uvular nasal can be represented by nh or ḥn (p. 160 and Inl. p. 19).

[The sixteenth- and seventeenth-century Hebrew grammarians were understandably hard put to it to describe ḥeth and 'ayin adequately.

Reuchlin (1506, p. 7): Domicilium tamen possident He et Heth in p̄cordiis (which may be practically anywhere in the human anatomy, see Lewis and Short, A Latin Dictionary, s.v. praecordia).

Most grammarians equate ḥeth with 'double h' or Greek χ.

François Tissard (1508): ('Ayin) in fundo stomachi, veluti ex imo pectoris, suspiria ducendo (quoted by Kukenheim, 1951, p. 100).

Other writers advise the learner to pronounce 'Ayin (called Ain, Gnain or Ngajin) as ng (Fr. ng in Anglois (Anglus) and manger (edere) (sic), Wasers, Archetypus, 1600), or as gn (preferably as Greek γν), as a short and obscure a (Erpenius, 1621, p. 5), or not to pronounce it.

Buxtorf (1673, p. 2) and Ruschat (1707, p. 1) solve the problem by calling 'Aleph spiritus tenuis sive lenis, he spiritus asper primus, ḥeth spiritus asperior (aspiratio densiora), and 'Ayin spiritus asperrimus (aspiratio densissima).

Wilkins (1668, p. 367) believes that the 'power' of 'Ayin is 'a more soft and slight manner of pronouncing the letters N and G compounded together'. '... in the opinion of Bellarmine, and some other Grammarians', the true sound of Hebrew 'Ayin is [ḥ̣] (see also Wilkins, p. 371 and Cooper, 1687, p. 20 and note that according to Diringer, p. 182 'Ayin is pronounced ng in Anglo-Sephardi.]

On pages 61 ff Montanus deals with the free rustling roof letter ch (= [x] , pronounced [χ] by many speakers of Standard Dutch to-day).

That *ch* is not a double letter consisting of the sounds of *c* and *h* is proved by a long series of arguments.

There is no change of form or movement of the mouth during the production of *ch*.

(p. 62) The sound is uniform throughout. *C* has the sound of *k* or *s*. If *ch* were *c + h*, it would sound either like *k + h* in 'Kheb' or Greek *chi*, or like *s + h* in 'Sheeren',<sup>3)</sup>.

That it is a single letter appears from the fact that in syllables it can be combined with three other non-syllabic letters preceding or following the 'upper letter' or syllabic sound, e.g. in 'erchst/hoochst/laechst/'tschrift' ([ɛrxst], [ho·xst], [la·xst], [tsxrift]).

This would be impossible, if *ch* were more than one letter, since there cannot be more than four single letters following an upper letter, and an initial group of four is even rarer than a final one.

Word-final *ch* changes into *g* when a suffix beginning with a vowel is added to the word, e.g. 'hooch/hooge' ([ho·x],[ho·yə]).

Under the same circumstances *s* changes into *z*, and *f* into *v*. *S* and *f* are not any more double than *z* and *v* into which they change. As a matter of fact they are even less double.

[Montanus probably means that [s] and [f] consist of noise only, while [z] and [v] have voice as well as noise, cf.

M. p. 39, above, 5.3., p. 117.]

Hence *ch* is even less double than *g*, which as everybody agrees, is a single letter. People may object that *ch* changes into *gh*, not into *g*. In my discussion of *g* I shall show that this is

not true.

Ch is neither c nor h, nor any other known letter. No letter of the alphabet can spell this sound.

(p. 63) The improper use of c and h to denote it, can, however, be interpreted as an attempt to show that this sound has c (= s) and h for its next-door neighbours on either side, s being a tooth rustler, h a throat rustler, and ch a roof rustler.

As this letter is new (i.e. newly discovered) and much used, it needs a new name.

Montanus proposes to call it 'Ech', pl. 'Echchens'. In its name it needs the addition of a vowel to its own sound, because it cannot form a syllable or word by itself<sup>4)</sup>. The vowel should precede it not only because the similar letters s and f have names beginning with the vowel e, but chiefly because it is rarely used initially and often finally in our language. The corresponding free rustling-sounding ('broad-rustling' in the terminology of the Appendix) roof letter is g (= [ɣ] pronounced [ɣ] or [χ] by many speakers of Standard Dutch to-day). Some people, noticing the two elements (noise and voice) of g, think it consists of g and h. This accounts for the spelling gh. However, the noise in g is different from that in h. H is a throat letter, g a roof letter. The noise of h comes before or after the sound of another letter, in g the noise is combined with the sound of the same letter. In h the noise is perfect and unbroken, in g it is imperfect and broken.

(p. 64) Double letters follow each other in speech. In g sound and noise are simultaneous. If gh were g + h, the beginning of 'ghebet' would sound like that of 'g'hebt'. Z and v also have voice and noise, but people do not think they are z or v + h or write zh, vh.

The name of g is 'Gee'.

(p. 70) The free tooth rustlers may be called 'Essens'.

They are either toothflesh (= alveolar) rustlers, like the first letter in Fr. 'chose, cheveul, chascun' and Du. 'sjoo - hoo<sup>5</sup>'), or toothbone (= dental) rustlers, like the first letter in Du. 'Schaep,' etc. and Frisian 'seer' (Du. zeer).

The free rustling-sounding (or broad-rustling) tooth letters are usually called 'zeevens', but Montanus prefers to call them 'zeen', sg. 'zee'.

The first speech-letter in Fr. 'je, juste, jaques' is a toothflesh rustle-sounder. The French marking-letter j has the power of zj, in which z is a toothflesh letter.

The first letter in Du. 'zoo', and the last but two in Du. 'donzde' are toothbone rustle-sounders.

(p. 74) The free lip rustler, called 'Ef' or 'Effe', is illustrated by the first letter in 'fraei', the last letter in 'lijf', and the Frisian pronunciation of v.

The corresponding rustle-sounder is 'vee', wrongly called 'uu' or 'uuwe'. An example of it is the first letter of 'van', Wis a steady lip vowel (see above, Chapter VII, pp. 160 ff).

(p. 76) The trilled letters are called 'Erren' or 'Errens', sg. 'Er' or 'Erre'. These names contain examples of the letters in question. Er is often referred to as the dog's letter, because dogs are supposed to produce this letter when teased. Also the note of ravens, crows, etc. is thought to be mingled with r's. Their sounds are not r's, however, but creaking or croaking letters. They are often used by many people in speaking.

So far only one species of r has been recognized, but reason and experience have taught Montanus that there are various species of r, some of which are used in languages ('inde Spraeken'). Montanus, however, confines his attention to the tooth r's, which are used on a large scale in languages ('inde Taelen'). (See also p. 103 above.)

Tooth r's are produced by trilling the tip of the tongue about the upper teeth, i.e. their trilling dividing-door is at the upper teeth.

We will not now divide the tooth r's into lower species, although they contain them.

Split letters are called 'Ellen'. (See also p. 104 above.)

Montanus gives examples of [l] in word-final, word-initial, and post-consonantal/pre-vocalic position in Dutch words.

They are all toothbone l's.

In the Fr. words 'bailler, tailler, grenouille' and in Fr. loan-words used in Dutch and spelt with -lli-, -lllj-, -llj- toothflesh (= alveolar) l's are heard.

(p. 77) The nose letters form one of the two species of closed-door letters, the other being the chokers.

There are inner-mouth and outer-mouth nose letters. There are no throat-nose letters because the throat is behind the nose. If the throat were stopped or closed, no sound could pass into the nose <sup>6)</sup>.

Inner-mouth nose letters are either roof- or tooth-nose letters. The roof-nose letter is 'Eng' or 'Engnge'. It is most often used as a back letter, i.e. it is usually final in syllables and words.

Examples are the last speech-letters in 'lang, bang, breng' together indicated by ng [Montanus means that final [ŋ] following a (short) stressed vowel is long and should really be spelt nng], the last in 'maeking, hearing, bocking' indicated by ng [here [ŋ] is short, because it follows an unstressed vowel], and the third in 'dank, danct', etc., indicated by n [cp. M.p.78: 'spring, zing' end in double eng, 'drink' has a single eng].

An alternative symbol to ng in Montanus' notation is ,n (Inl. p. 19).

It may seem strange that there should be such a letter as Eng. Therefore, Montanus will prove its existence.

As there are lip- and tooth-nose letters, there must be a roof-nose letter as well. The dividing-door can be shut at the roof, as is proved by k, and the roof is not behind the nose-door.

The reader is invited to pronounce and feel it.

The sound of eng is quite different from that of all other letters, even from that of n. This appears from a comparison of the word 'eng' with 'enn', or 'ring' with 'rinn'. [A few more minimal pairs are provided, including 'werking/werken'.] These are distinct language-words, differing only in the nasals. (p. 78) That ng is not n followed by g is proved by the following arguments: There is no change of form or movement of the mouth during the production of ng. The sound is uniform throughout. The dividing-door remains closed till the end. Therefore, there cannot be a g, since g is an open-door letter. A great difference can be heard between 'zing/jong' on the one hand and 'ingaen/ong'nae' on the other. [In the latter pair Montanus obviously pronounced [n] + [ɣ].]

Natural lengthening of words ending in -ng is not effected by adding -gen. In reading, however, this is often done, because improper spelling may lead to improper pronunciation<sup>7)</sup>. In Dutch no unabbreviated (? unshortened, M. 'zonder vercorting') words end in g, though g is often written. [He means that they all end in the voiceless fricative.]

Some people, noticing that -ing does not express the sound properly, spell ijng. They are wrong. If in -ing words there were two i's which were responsible for the clear nasal sound heard in them, there would also have to be an i in 'breng, lang', etc., or else two e's, a's, etc. Both these suppositions are absurd.

If there were two ground-letters in the present tenses 'spring, zing, drink', there would also be two in the preterites and past participles 'sprong or sprang, zong or zang, dronc or dranc; gesprongen, gezongen, gedronken.'

But they are pronounced with a single ground-letter, which proves that there is a single one in the present. This applies to other verbs as well, e.g. 'winnen, beginnen, spinnen'.

(p. 79) Where there is a double ground-letter in the present (e.g. schijn, verdijn), there is a double one in the preterite and past participle (scheen, gescheenen; verdween, verdweenen).

A great difference can be heard between -ing in 'wijngaert' and in 'dwingen', and between -ink in 'wijn-kanne' or 'wijn-kelder' and in 'hinken' or 'winkel', at least in natural and proper pronunciation.

Tooth-nose letters are either 'Ennens', sg. 'En' or 'Enne' or 'Enjnens'.

The former are toothbone letters, of which examples may be heard in 'neen, winnen, snacken', the latter are toothflesh letters, which are heard in 'Frangie, Orangie, Spangie' 8), Fr. 'gaigner, manger' 9), Sp. 'Señor'.

The outer-mouth- or lip-nose letter is 'Em' or 'Emme', as in 'Mamme, lam', etc.

Choked letters are either sounders or abortive rustlers.

Sounding chokers cannot be produced in the throat, since all letter-sound (= voice) receives its essence in an open throat, and such choked sounders would have to have a closed throat, (p. 80) which would prevent the production of sound (= voice). There may, however, be an attempt to produce sound. 10)

Inner-mouth choked sounders are either roof letters or tooth letters.

As there are sounding lip and tooth chokers, both of which

much used, there must also be a sounding roof choker. It occurs in English words spelt with g not followed by e or i. This English g has a sound which is quite different from the one which we and other nations denote by g. The place for the sounding roof choker in Montanus' series of letters was empty, until he thought of this sound. Montanus (Inl. p. 19) represents [g] by γ, because he is firmly convinced that in Ancient Greek gamma was pronounced as a plosive, in spite of the fact that it is now pronounced as a fricative by everybody except the English.

The reason for this conviction is the relation (analogia) which exists between the Greek tenues and mediae, which is  $\pi : \beta :: \tau : \delta :: \kappa : \gamma$ .

Moreover, if the value of Ancient Greek γ had been [γ], it would not have interchanged so easily with κ.

As the Greek symbol does not harmonize with the Roman symbols, he would have preferred to use c with a dot in the centre to indicate [g], the more so, because he has reason to believe that c originally had this value.

Unfortunately the printers have no such type available.

The name of this letter is 'English or choked yee'

Montanus does not know of any words in any other language than English in which it occurs, except perhaps in some mixed words (= compounds) in our language, such as 'hekboot, slikbot', etc., in which the k of 'hek' and 'slik' is changed somewhat to  $\gamma$  when joined to the b.

Similarly, t changes into d in 'zitbanc', 'handboom', p into b in 'Coop-broot', 'loop-baen' <sup>11)</sup> .

K seems to change completely into  $\gamma$  in 'k doe, k ben, k bac', and s into z in 's daechs', and t into d in 't broot' <sup>12)</sup> .

There are numerous examples of  $\gamma$  in English, such as the first letter in 'good, God, great', etc.

The English are so used to this letter that in all the languages they learn they substitute it for g (= [ $\gamma$ ]), and can thus be recognized as English, just as the Ephraimites betrayed their nationality by their pronunciation of the letter sin.

If an Englishman is asked to repeat a Dutch, French, Latin or other word containing g, he will pronounce it with  $\gamma$ .

(p. 81) A sounding toothbone choker, whose name is 'dee' can be heard in 'dam, dooden', etc. 'Plumadje, stelladje' and Fr. 'Dieu' contain sounding toothflesh letters.

Montanus proposes the name 'd<sub>ee</sub>' or 'd<sub>j</sub>ee' (which is easier to pronounce) for the sounding toothflesh choker. The latter name is wrongly given to g by some people. 13)

The sounding lip choker, 'bee', is heard in 'bal, tobbe', etc. Chokers which try to rustle are made in the throat, in the inner mouth and at the lips.

The throat choker is related to the one trying to make sound referred to above. Both are silent in their grounds and they have the dividing-door in the same place. They belong to the same proximate genus, viz. that of throat letters trying to have sound (whether noise or voice).

As far as Montanus knows, they are not used as essential parts of language-words, and therefore, they are not denoted by symbols, whether proper or improper, in writing.

Nevertheless, they are often used in speech; they precede words beginning with a snap vowel, and sometimes they occur in other words as well. One is at liberty to use or not to use them. Moreover, the sound made in groaning (M. 'steenen') and coughing usually begins with this letter, and panting (M. 'snacken') ends with it. Many animal sounds, such as that of the cuckoo, the cock, which through ignorance of this newly discovered genius of letters, people have thought to be mingled with K and represented by K in writing, do not

contain K but this letter, which has the greatest affinity with K, but yet differs considerably from it.

The name proposed for the throat choker trying to make noise is *Ḳee*.

In the Appendix (p. 160), where the throat is divided into larynx and uvula, Montanus assigns the glottal stop to the larynx and states his belief that the sounds made in vomiting, coughing, and laughing are laryngal, but that the sound of expectorating is uvular.

His symbol for the broad larynx choker is *ḡ*, that for the broad uvular choker is *ḡ*, because they are most nearly related to *g* (= [g]). The narrow larynx choker is indicated by *ḱ*, the narrow uvular choker by *ḱ*, because they are most nearly related to *k* (Inl., pp. 19 f).

Inner-mouth chokers trying to make noise are either roof letters or tooth letters.

(p. 82) The roof letter is heard in 'kraeken, kijken, coomen, quellen,' etc. Its usual name is 'Kaa' or 'Qúu'. Sometimes it is quite wrongly called 'Cee' with the *c* pronounced *s*. A better name is 'Kee'.

The generic name of tooth chokers is 'Tee'.

There are two species, viz. toothflesh and toothbone letters. The former are less usual. They may be heard in 'tjoc, tjilpen, mannetje, houtje, (Fr.) Christien, Estien'.

The latter occur in 'tot, Stat', etc.

The lip choker trying to make noise is 'Pee', as in 'pap, poppe', etc.

(p. 96) Double or long consonants, i.e. not-free-sounding letters in Montanus' terminology, such as rr, ll, mm, zz, dd, have one form and one breathing. The breathing is steady. These double consonants occur finally in stressed syllables, though they are usually denoted by a single letter in traditional orthography, e.g. 'wer, hel, bal, min', etc., which ought really to be spelt 'werr, hell, ball, minn', etc.

Montanus produces four arguments to show that these consonants are really long or double.

1. It can be heard. To prove this Montanus compares the monosyllables 'wer, bel, ken, stem, zich, and zet' with disyllabic words ending in unstressed -wer, -bel, -ken, -sem, -zich, and -zet, respectively, pointing out that there is a difference of length as well as of height between each pair. (It should be noted that the vowel in all the unstressed endings given by M., including -zich is [ə] in Pres.Du., see above, p. 176).

2. As there are double letters of more than one form (see below, p. 189), it would be absurd if there were not double letters of one form as well, the more so as the latter are easier to pronounce and combine more easily.

3. Two such one-form letters occur and are represented in the spelling in the same words when a syllable is added to them, e.g. 'wer, werren; hel, hellen; min, minnen;' etc. From this it follows that those two one-form letters which in the longer words belong to two syllables, belong to one syllable in the shorter words, since that syllable does not receive

a letter from the ending, but, on the contrary, gives up one of its own to be added to the ending.

As in 'wandelen' and 'rispen' the l and the p which belonged to the shorter words 'wandel' and 'risp' are removed from them and added to the ending (wande-len and ris-pen), 'werren, hellen, and minnen' must come from 'werr, hell, minn' and not from 'wer, hel, min'.

4. The Germans and the English often write these long letters, as in 'Herr, vvoll, dann, kkomm, Gott'; 'all, till,,shipp, nett'. We might add that in Dutch long k and j are expressed in writing by ck and y, as in 'dick, zack, ey, Mey', from which it might be inferred that other consonants in the same position should be doubled, but as ch and y are used inconsistently, they do not yield much proof.

(p. 99) The double letters of one (steady) breathing and two forms include those which have been called Duplices Consonantes, such as x or ks, ψ or ps.

They all consist of not-free-sounders, except wr-, -rw, -rj. (For other consonant-groups see below, Chapter X.)

[It is understandable that the early writers on pronunciation were, on the whole, more successful in their analysis of consonants than in that of vowels. Contact or close approximation of the organs of speech is, of course, easier to investigate than variation in the vertical and horizontal position of the tongue.

By Montanus' time satisfactory descriptions of a limited number of consonants had been given by writers like Smith and Hart in England and Bonet in Spain.

That [r] was a tongue-trill had been known since Plato's *Cratylus*, and it had been fairly constantly referred to as 'litera canina' since the days of the Roman satirists Lucilius (2nd century B.C.) and Persius (1st century A.D.), while [s] was often called 'litera serpentina'.<sup>14)</sup>

Though Dionysius of Halicarnassus had described [m] and [n] as nasals, many later writers seem not to have been aware of the part played by the nose in the production of these and other sounds.

The recognition of [l] as a lateral comes fairly late.<sup>15)</sup> That Montanus, like Wallis after him, analyses [f] and [v] as bilabials is surprising, since even the Romans (e.g. Terentianus Maurus, Marius Victorinus, Martianus Capella) describe [f] as a labio-dental (their v being, of course, bilabial) and labio-dental descriptions of both [f] and [v] are to be found in many of Montanus' immediate predecessors. Moreover, his fellow-townsmen De Heuter classes

[f] as a lip-teeth sound in 1581.

The difference between [p] and [n] was noticed by Meigret, Ramus, Bonet and others. Lodwick seems to have been the first in England to recognize [p].<sup>16)</sup> Wallis, 1699, rather thinks it is [ŋ]. [ʌ] was distinguished from [l] by Trissino, Péletier, Meigret, Ramus and Saint-Liens in the sixteenth century.<sup>17)</sup> Some of the early English writers identify it with Welsh [ɹ].

Like Montanus, several sixteenth- and seventeenth-century phoneticians, e.g. Sexagius, Robinson, Wallis, equate [ʃ] and [ʒ] with [sj] and [zj] or [si] and [zi].

Sounds like [ç] and [x] in a language where they were spelt ch caused great trouble to the orthoepists and orthographers. This is what Albertus, 1573 (ed. Müller, p. 23), has to say about the German letters c and ch: 'C est c latinum, sæpissimè assumit aspirationem et tum idem valet quod χ græcum, pronunciatum etiam ut χ vel γ, gleich (similis).'<sup>18)</sup> It is not surprising that Montanus devotes so much space to his 'Ech'.

Lodwick, Newton, Wilkins, Holder and Cooper correctly identify [x] and [γ] as velar fricatives.

That Montanus failed to notice [g] in Frisian, German, French, and other languages with which he claimed to be familiar is probably the greatest single blunder in 'The Art of Speech'.

Spiegelhel, (Amsterdam), 1584, pp. 52 ff, hears [g] in word-final and medial position in Dutch, where Montanus and

Pres.Du. have [x] (or [χ]) and [ɣ] (or [ʁ], [χ]), respectively. Van der Schuere, 1612 (ed. Zwaan, pp. 20 f), mentions it as dialectal.<sup>19)</sup>

Montanus' remark on C originally standing for [g] is probably based on Quintilian I, vii, 28 or Terentianus Maurus 893 ff (Caius or C. for Gaius).

Whether [h] is a letter or a mere 'breathing' was a problem that exercised the minds of the learned for close on two millennia.

Quintilian, I, iv, 9, and I, v, 19 doubts whether [h] is a letter, Priscian, I, iv, 16 is quite sure it is not.

Madsen, pp. 54 ff proves with the help of minimal pairs that [h] is a letter. Holder, pp. 67 f, says that [h] is not a proper letter as it has 'no new figure in the mouth'.

It is neither a consonant nor a vowel, but 'a guttural aspiration before or after other letters'. It is produced by a 'more... forcible contraction of the Lungs' and perhaps there is 'straightening of the breath in the larynx'.

Bonet, p. 87, points out that in [h], as in the vowels, the breath is not intercepted by the tongue, teeth or lips, but the vowels are sonorous, while [h] is not. The position of the mouth is the same as for the vowel 'A' (cf. the quotation from Martianus Capella, Sturtevant, p. 106), hence [h] is a non-sonorous A.

To Wilkins, pp. 358, 360, [h] is the voiceless counterpart of his 'guttural' vowel ʏ.

Cooper, 1687 (Sundby, p. 21), describes [h] more or less as the voiceless version of the vowel by which it is followed. He also says that 'In pronouncing the vowels the aspiration goes through the whole sound, when it is set before them, and cannot be separated from them.'

It will have been noticed that in his first analysis, which he does not completely reject, Montanus looks upon [h] as the steady, not as the voiceless, counterpart of the following vowel.

That it is possible for noise and voice 'to come out of the throat at once' (see above, p. 198) was realized by the Ancient Indians, but hotly denied by Whitney in the nineteenth century (Allen, *India*, p. 35).

It was not till late in the nineteenth century that the presence of [h] in a number of languages and its relation to whisper was established by means of experimental methods (see Scripture's *Elements*, pp. 24 and 276 f; cf. Pike, *Phonetics*, pp. 135, 140, 142).

Montanus' remark on [h] being at one time represented by a 'marking-letter' in Greek (see above, p. 198) is probably based, directly or indirectly on Priscian I, viii, 47 (Keil II, p. 35) (cf. Choeroboscus in Bekker's *Anecdota* 780, τὸ δειχόστημα τοῦ H. For further references see Gräfenhan I, p. 450. Compare also Hart, *The opening and An Orthographie*, pp. 135 and 207 in Danielsson's edition; Madsen, pp. 57 f).

I do not remember having seen any references to the glottal stop prior to Montanus. Hebrew 'Aleph was equated with 'spiritus lenis' (see above, p. 201), which was looked upon as a negative sign (viz. denoting the absence of spiritus asper, cf. Madsen, pp. 159, 165).

Madsen failed to notice the glottal stop in Danish.

Lodwick provided a symbol for it in his 'Universall Alphabet' (see D. Abercrombie, *Forgotten Phoneticians*, T.P.S., 1948, pp. 1 ff).

Holder was the first to describe it in England (*Elements*, pp. 60, 72, 73).

With Montanus' discovery of glottal stops in cuckoos and cocks we may compare C.H. Grandgent's Phonetic analysis of 'a duck's conversation' as [ʔəʔ] (*Getting a Laugh*, Cambridge, Mass., 1924, p. 81).

Noises similar to the laryngal and uvular ones briefly touched on by Montanus in the Appendix (see above, pp. 211 f) are mentioned by Newton ('the (Welsh) jarring of the throte as when we force up flegme', see R.W.V. Elliott, *MLR*, xlix, pp. 5 ff; Dobson I, p. 247), Wilkins (in a discussion of sounds produced with the root or middle of the tongue, *Essay*, p. 361: 'Trepidation; which will frame a sound like the snarling of a dog, to which there is a correpondent mute, like that motion which we make in haaking, not necessary to be provided for by any Letter for Language'), and Holder (on the fricative corresponding to the glottal

stop: '... and this being relaxed may make by a Pervious Appulse there, a shaking of the Larynx, as when we gargarize: like as snorting inwards doth by shaking the Uvula, and as may be done with the Lips', *Elements*, p. 73).

That [ŋ] was a special sound differing from both [g] and [n], in spite of the fact that it was represented by γ in Greek and by n in Latin, had been known since antiquity. The loci classici are Gellius, *Noctes Atticæ*, XIX, xiv, 7, and Priscian I, vii, 39, Keil II, p. 30 (both printed by Sturtevant, pp. 154 f).<sup>20</sup> Although it had a name ('agma' or 'aggma'), in the seventeenth century it was often referred to as 'litera anonyma', a designation given to it by Vossius, presumably because there was no special character to represent it in ancient or modern languages.

The Germanic runic alphabet, however, included a sign, called 'ing', for [ŋg], which in the earliest inscriptions looks as if it is made up of two capital gammas.

The First Icelandic Grammarian also has a symbol for [ŋg], which he calls 'eng', i.e. by the name that Montanus and Wilkins were to use for [ŋ].

The early English spelling-reformers Smith, Hart and Bullokar do not provide a special symbol for [ŋ]. The first to do so are Robinson, 1617, and Gil, 1619. Before them it had been identified by P.G., the author of *Grammatica Anglicana*, 1594. One possible conclusion that may be drawn from all this is that by the end of the sixteenth century

[ŋ] had acquired phonemic status.<sup>21)</sup> Montanus provides the earliest evidence for phonemic [ŋ] in Dutch.<sup>22)</sup>

Lodwick, 'Aenmerkingen wegens de Nederlantsche Tale', MS Sloane 897, f 22 v, contrasts Du. 'van' and 'vange'.

Wallis and the later seventeenth-century English phoneticians identify [ŋ] correctly as the velar nasal. Dalgarno devotes considerable space to it in 'A Discourse of the Nature and Number of Double Consonants', 1680 (Funke, *Zum Weltsprachen-Problem*, pp. 104 f).

Some writers, including Ten Kate, 1699 and 1723, believe that -nk represents [ŋ̣].

In comparison with the *First Icelandic Grammarian* (Haugen's ed. pp. 21 ff) and *Robinson* (Dobson's ed. pp. 20 f) Montanus is fairly conservative in his naming of the consonants. From the traditional rule (attributed to Varro) that in the names of the 'semivocales' the vowel should precede, while in the names of the 'mutae' it should follow, he only deviates in the case of the voiced fricatives. His reason for doing so must have been that [ɣ], [z], and [v] cannot occur in word-final position in Dutch.

The great importance that was attached to the names of the letters appears from the fact that the difference between 'semivocales' and 'mutae' was sometimes explained from the nature of their names.<sup>23)</sup> The main theme of Bonet's 'Reduction' is that the names have to be reduced to the 'powers' of the letters in teaching the deaf.

Holder in the 'Appendix Concerning Persons Deaf and Dumb', Elements, pp. 111 - 168, insists on names for all the consonants ending in a vowel, because the 'opening of an appulse before a vowel' is easier to observe than the 'shutting of the organs to make an Appulse after a vowel, because in this the motion is resisted and hindred by the force of Breath, as much as it was assisted in the other' (p. 140).

Amman, 1692 and 1700, thinks he is the first to point out that the letters should not be named 'emme, elle, erre', etc., in teaching the deaf.]

Notes to Chapter IX

- 1) 'Rustler' here means 'abortive rustler'.
  - 2) Note the capital letter for this uvular sound. On p.160, however, it is used with various diacritics for 'roof letters'.
  - 3) Cf. Lodwick, MS Sloane 897, f 22 v.
  - 4) The traditional idea was that a consonant could not be heard at all unless a vowel followed or preceded it. Cf. Montanus p. 46: 'chs' is pronounced 'as if it were' a syllable.
  - 5) Pernot, reviewing Verschuur (op.cit. p. 175), says that Montanus does not mention [ʃ], apparently because it does not occur in his dialect. Verschuur quotes this passage from Montanus on p. 123 of his book.
  - 6) 'Throat' is here taken in the narrow sense of 'larynx'. On p. 160 Montanus wonders whether 'Ayin is not a uvular nasal. (See above, p. 200.)
  - 7) The spelling-reformer Siegenbeek in 1836 warns against 'abuses in reading-language' such as pronouncing the word 'jongeling' with n + g (De Vooy's, Verzamelde Taalkundige Opstellen III, p. 88).
- The present writer has heard semi-literate Dutch readers and singers pronounce [ŋʏ], [ŋx], and [ŋχ] for [ŋ].
- 8) These words are all spelt with -nj- in Pres.Du.

- 9) Compare the reference to Wasers, above p. 201, for another incorrect analysis of -ng- in Fr. 'manger'.
- 10) This is not an allusion to the glottal stop, which tries to make noise in the throat, and is discussed below, pp. 211 f, (M. p. 81).
- 11) Montanus spells 'zidbanc, coob-broot, loob-baen'.
- 12) For more examples of assimilation, see below, Chapter XII.
- 13) Cf. Zwaan's ed. of Van der Schuere, p. 61.
- 14) See below, Chapter X.
- 15) See above, p. 104.
- 16) Not, of course, as an English sound.
- 17) In Standard French [k] was not ousted by [j] till much later.
- 18) Cf. Jellinek II, p. 12 on Helber, 1593.
- 19) It seems to have been a North-Holland feature (see Kooiman's ed. of Twe-spraack, pp. 152 ff, and Zwaan's ed. of Nederduydsche Spellinge, pp. 62 f).
- 20) The authorities of Gellius and Priscian are Vigidius Figulus and Varro, respectively.
- 21) See Dobson I, pp. 70, 84, 132, 143.
- 22) See Zwaan's ed. of Nederduydsche Spellinge, pp. 58 ff.
- 23) Cf. Perottus quoted by Baebler, p. 150

CHAPTER XHEIGHT OF SOUND

(p. 82) The divisions of the single letters discussed so far have been made on the basis of properties which the single letters have in themselves.

Divisions will now have to be made according to the properties which the single letters have as matter of 'other speech'.

(p. 83) The speeches whose matter is supplied by the letters can be either 1. one-peak-membered, i.e. those in which no other snap letters are used than free-sounders, or 2. many-peak-membered, i.e. those which contain not-free-sounding snap letters as well. The Hebrew syllables and words containing a 'Sceva mobile' seem to belong to the latter category.

In the divisions which follow Montanus only deals with the free-sounding snap letters and the not-free-sounding steady letters (i.e. syllabic vowels and non-syllabic vowels and consonants). The not-free-sounding snap letters (i.e. syllabic consonants) are not considered.

[ Verschuur, p. 140, sees in Montanus' 'one-peak-membered and many-peak-membered speeches' an anticipation of the 'eingipflige und zweigipflige Silben' of the nineteenth-century German phoneticians (cf. E. Sievers, *Grundzüge der Phonetik*, 5th ed., Leipzig, 1901, pp. 219 ff).

I do not think this is correct. Montanus' many-peak-membered speeches' should not be interpreted as 'syllables containing more than one peak', but as 'words, word groups and sentences

in which one (or more) of the syllabic sounds are consonants'. His equation of Shewa mobile with syllabiness of consonants is comparable to his failure to distinguish adequately between the latter and svarabhakti (M. p. 45; see above, 5.5, pp. 129, 131). Montanus returns to the subject of syllabic consonants on page 112 (see below, Chapter XII).]

Single letters can be matter of syllables, words, sentence slices, sentence members, and sentences and have special properties in relation to each of those. We shall confine our attention to their properties in so far as they are matter of syllables.

The first of these properties is certain degrees of height of sound. There are six degrees, which may be numbered from 1 to 6. (Montanus also gives each of them special names).

The free snap vowels always sound highest in the syllable. (p.84) The highest but one are the free steady vowels, with the exception of j and w.

The free steady vowels always immediately precede or follow the snap vowels in a syllable. As soon as others come in between the snap and steady vowels, the resulting group cannot be pronounced as a single syllable.

Next below the steady vowels are the trilled letters (types of r). When they combine to form a syllable-initial or syllable-final group with a steady vowel or a letter of lower rank than themselves, they always stand outside the steady vowel and inside the letter of lower rank than themselves.

[ By 'standing outside a steady vowel' Montanus means 'following

it when the r belongs to a syllable-final cluster, and preceding it when it belongs to a syllable-initial cluster'. By 'standing inside the letter of lower rank' he means 'following it in an initial cluster, and preceding it in a final cluster'.]

Thus in *paerl*, *poort*, *verw*, *wroc*, *wrang* ([pa.rɪ], [pɔ.rɪ], [verw], [wrɔk], [wraŋ]) the r stands outside e and o, and inside l and w (and t, we might add; e here means the 'steady' element of long [a.]).

*paelr*, *parel*, *porot*, *vewr* could not be pronounced as single syllables.

The next in rank are j and w (the steady dental and labial vowels) and the split letters (l). In a syllable they always stand outside the letters of higher rank and inside those of lower rank, e.g. *wreet*, *Gerw*, *derj*, *splijt* ([i.] is really [ij] according to Montanus), *blaew*, *veelm*, *schelm* ([wre.t], [ɣerw], [derj], [spli.t], [blɛ.w], [ve.lm], [sxelm]).

It may be a little difficult to pronounce these words monosyllabically, and there seem to be two peaks, but it is far more difficult and the impression of two peaks is even stronger, if one pronounces them as follows: *rweet*, *Gewr*, *dejr*, *lspitj*, *blawe*, *veeml*, *scheml*. This proves that w and j and l are of lower degree than r and steady e, and higher than s, p, t, b, and m.

That l, j and w are of one degree can also be inferred from the fact that they cannot very well succeed each other, and when they do, each of them can stand inside, but j seems to

be a little higher and can be more easily placed inside l than outside it. It is, for instance, easier to pronounce the following as monosyllables: dweil, heil, ij1, vij1, baej1, schaej1, ([dwej1], [hej1], [i·1], [vi·1], [ba·j1], [sxa·j1]) than dwelj, helj, ilj, baelj, schaelj.

But zwaelw ([zwa·lw]) and zwaew1, ówltje ([ɔwltjə]) and ólwtje are equally difficult to pronounce monosyllabically.

[ Montanus must have been thinking of the first syllable of the latter word.]

The nasals are next in rank.

In a syllable they always stand outside the higher letters mentioned above, and inside the ones lower than themselves.

In any other position they cause an additional peak. Compare helm, rein, ic tern, derm, smal, knaech, gnor, plomp, rank, gunst ([helm], rejn],[tern], [derm], [smal], kna·x], [ɣnɔr], [plomp], [rank],[ɣɛnst]), and

heml, renj, tenr, demr, msal, nkaech, ngor, plopm, rak·n (·n = [ŋ]), which have to be pronounced with two peaks.

The lowest letters are g (= [ɣ]), z, v, γ (= [g]), d, b, ch (= [x]), s, f, k, t, p, and h.

In a syllable they always stand outside the letters of higher rank, e.g. groot, glas, zwaer, etc. ([ɣrɔ·t], [ɣlɑs], [zwa·r]). rgoot, lgas, wzaer could not be pronounced as monosyllables.

That the lowest letters are all of the same degree, i.e. equally high in the syllables, appears from the fact that when joined in a syllable, they may occur in any order, e.g. syllable

final zd and dz (both before an elided e), st and ts, ps and sp, sch and chs; syllable initial st and ts, ps and sp, tk and kt, pt and tp; syllable final cht and syllable initial tch.

[ In the examples of initial ts, tk, tch, tp the t represents the weak form of the neuter definite article. In kt the k represents the weak form of the 1 sg. pers. pron. The example of pt is Ptolemaeus <sup>1)</sup>.]

Some letters of the same degree when compared amongst themselves differ slightly as to height of sound. Among the nasals, for instance, the deeper letters (i.e. those articulated nearer the throat) sound higher than the shallower: ng is higher than n; ng and n are higher than m.

A descending scale of letters arranged according to their degrees of height would look as follows:

- |  |   |   |
|--|---|---|
| 1. snap vowels   | } | Both series open with the 'deepest' vowels. |
| 2. steady vowels   |   |   |
| 3. r   |   |   |
| 4. j, w, l   |   |   |
| 5. ng, n, m  |   |   |
| 6. h, g, ch, γ, k, z, s, d, t, v, f, b, p (arranged according to 'depth'). |   |   |

At the top of page 85 he provides two alternative arrangements of his lowest letters, in both of which the fricatives precede the plosives, but in one of them the voiced consonants are placed above the voiceless ones, while in the other voiced and voiceless consonants are paired off.

[ Montanus does not define the word 'height', but on page 99 and elsewhere he equates it with 'loudness', and it is quite clear from his use of these terms that by them he means what in the nineteenth century came to be called 'sonority'. The sonority concept can be traced back to the Greek idea of εὐφωνία ( see the quotations from Dionysius Thrax on p. 30 of W.S. Allen's 'Phonetics in Ancient India', and note that Priscian, III, 9 (Keil II p. 9) renders the Greek term by 'sonoritas'. Quintilian (Inst. Or., I, v, 4) translates εὐφωνία by 'vocalitas'. Dionysius of Halicarnassus arranges the Greek vowels and consonants in a descending order of εὐφωνία ('De compositione verborum', Chap. XIV, ed. Roberts, pp. 136 ff).

Montanus' sonority table agrees exactly with those of Sievers (Grundzüge, 5th ed., pp. 204 f), Viëtor (Elemente der Phonetik, 5th ed., Leipzig, 1904, p. 305), and Jespersen (Lehrbuch der Phonetik, 3rd ed., Leipzig und Berlin, 1920, p. 191), except that theirs do not include [j] and [w]. Like Montanus, these more recent writers believe that sonority is an important formative factor in the syllable (see also Pike, Phonetics, p. 118).

It is surprising that Montanus does not include [j] and [w], which are 'steady vowels', among the letters of the second degree. His ranking of them as fourth-degree letters lands him in serious trouble on page 84. It is certainly easier to pronounce 'dejr' as a monosyllable than 'derj'. He does admit, however, that j is 'a little higher' than l.]

His exposition of the degrees of height of the letters in syllables is followed by a dissertation on the traditional division of speech sounds into vowels and consonants and the further division of consonants into semivowels and mutes, which according to him, is a poor attempt at a classification of sounds according to the property of height and hence their function in the syllable.

(p. 86) For by the term 'vocales' they have tried to indicate the letters which have the highest sound, and which can by themselves constitute a syllable, and by 'consonantes' those which are lower and sound with the 'vocales'. Among the 'consonantes' the 'semivocales' have the highest sound, and the loudest among them are the 'Liquidæ', i.e. melting letters, called thus because, as they say, their sound sometimes becomes softer and melts. The 'Liquidæ' are again subdivided into 'Acutæ' and 'Obtusæ', of which the former are the louder.

[ The earliest extant classification of speech sounds in the West is to be found in Plato (Cratylus, 424 C, Philebus, 18 B f, where Socrates is the speaker, and Theaetetus, 203 B, where Theaetetus is the speaker). The στοιχεῖα are divided into φωνήεντα, which have φωνή, and ἄφωνα, which have no φωνή, but some of them have noise (ψόφος) or some kind of sound (φθόγγος). These are called τὰ μέσα in Philebus, 18 C, and the only example of them given by Plato is σ (Theaetetus, 203 B).

The others have no sound of any kind, and are called ἄφωνα καὶ ἄφθογγα in Cratylus, 424 C, and ἄφωνα in the strict sense in Philebus, 18 C. This category includes β and most of the other

letters (Theaetetus, 203 B).

The fundamentum divisionis in Plato is the presence or absence of φωνή, which is not so much the matter of speech as the matter of vowels (φωνήεντα).

Aristotle (Poetics, C. 20, 1456 B) takes over this threefold division with a difference. Φωνήεντα have φωνή and no προσβολή. I take προσβολή to mean 'contact' or 'stricture', and not, as some scholars do, 'addition (of another letter)', which does not make sense in the description of the ἄφωνα.

Φωνή is audibility, sonority, or euphony, or Montanus' 'height of sound', i.e. a phonological criterion, προσβολή is a phonetic criterion (cf. Allen, *India*, p. 29).

Plato's μέσα are called ἡμίφωνα by Aristotle. They have φωνή as well as προσβολή. The only examples given by Aristotle are σ and ρ.

The ἄφωνα have προσβολή without φωνή. Examples are γ and δ.

A more elaborate classification of the Greek sounds is to be found in Dionysius Thrax, Dionysius of Halicarnassus and the Scholiasts in D.T.

The term φωνήεντα is retained for the vowels (Sextus Empiricus, *Adv. Math.* I (A.Gr.), 55 calls them φωνάεντα), the consonants are called σύμφωνα and are divided into ἡμίφωνα and ἄφωνα.

The ἡμίφωνα are subdivided into the διπλᾶ ζ, ξ, and ψ, and the ἀπλᾶ λ, μ, ν, ρ, σ.

The treatment of the διπλᾶ as single units is criticized by Sextus Empiricus, VIII, 104, but defended by a Scholiast in D.T. on phonological grounds (see Robins, *T.P.S.*, 1957, pp.86 f).

The ἀπλᾶ are also referred to as ἀμετάβoλα, because they do not undergo any change in declension and conjugation, and as ὑγρά, which term is explained in a variety of ways (see Steinthal, II, pp. 199 f; Allen, India, pp. 31 f; Robins, T.P.S., 1957, p. 87).

The ἄφωνα are subdivided into the ψιλὰ π, τ, κ, the μέσα β, δ, γ, and the δασέα φ, θ, χ. (For a convincing explanation of this classification see Robins, T.P.S., 1957, pp. 87 ff). Sextus Empiricus, Adv. Gr., 102, groups φ, θ, χ among the ἡμίφωνα, but adds that some writers look upon them as ἄφωνα. Diogenes Laertius, VII, 57, attributes their inclusion among the ἡμίφωνα to Diogenes Babylonius Stoicus, who lived in the second century B.C., when these aspirated stops could hardly have changed into fricatives yet. (See Steinthal, II, p. 193; Blass.-Purton, pp. 101 f; Sturtevant, p. 77; Allen, India, p. 30).

The Romans took over this Greek classification, translating φωνήεντα by 'vocales', σύμφωνα by 'consonantes', ἡμίφωνα by 'semivocales', and ἄφωνα by 'mutae'. Priscian even adopted the subdivision of the ἄφωνα, rendering the Greek terms by 'tenues', 'mediae' and 'aspiratae', the last mentioned category being, of course, singularly inappropriate to Latin.

The ἀμετάβoλα became the Latin 'immutabiles' and as ὑγρά they became 'liquidae' ('uda' in Terentianus Maurus).

The division of the semivocales into liquidae and firmae, and the subdivision of the liquidae into acutae and obtusae, referred to by Montanus, stems from Ramus.

In his 'Grammatica Latina', of which the first edition appeared in 1559, Ramus divides the consonantes into semivocales and mutae, the semivocales into 1. liquidae or diductae, which are subdivided into acutae (s, r, l) and obtusae (m, n), and 2. firmae or contractae (j, v, f). (Cf. his division of the vowels into diductae and contractae).

The mutae are divided into apertae (dentales t, d; palatinae c, q, g) and clausae (b, p). This division of the mutae is not mentioned by Montanus.

Ramus' classification was adopted by a great many sixteenth- and seventeenth-century grammarians.

Madsen, pp. 136 ff, criticizes the division of consonantes into semivocales and mutae and points out (pp. 152 ff) that it is based on loudness or euphonia. He prefers the Hebrew classification according to the organs of speech, although it is also imperfect.]

As this division indicates in an obscure and imperfect way what I have discussed in this chapter clearly and much more perfectly, it might be discarded, were it not that it has been held in esteem for so long and in so many countries. (p. 87) I would gladly have retained this one old division among all my new descriptions, but that would have contributed to the perpetuation of error and confusion. They do not include consonantal j or Hebrew 'Iod' among the 'vocales', nor, our w or Hebrew 'Vau'. At the same time j and w following a vowel, as well as others in that position, are considered to be vocales, though they are all consonants, as I have proved.

[ On i/j and u/v in Latin see Priscian, I, iv, 17 ff (Keil II, pp. 13 ff); Jeep, p. 113; Sturtevant, pp. 140 - 147).

Scribes in the later Middle Ages paved the way for the modern distinction between i and j, and u and v by preferring j and v in initial position, where they more often had consonantal than vocalic value.

Lembattista Alberti ('De componendis cifris', 1465) seems to have been the first of the moderns to insist on the u/v distinction (see Kukenheim, 1932, p. 14).

Antonio de Lebrija or Nebrija ('Gramatica de la lengua castellana', 1492), who is also responsible for Spanish ll, ñ, and ch; and Giovan Giorgio Trissino ('Epistola de le lettere nuovamente aggiunte ne la lingua italiana', 1524) distinguish between consonantal j and v and vocalic i and u, and are followed by several of the French orthographers and grammarians, notably Meigret and Ramus.

Although j and v were known as the 'lettres ramistes', Ramus himself (Scholae Grammaticae, 1559, pp. 55 f) credits the printers with their introduction (Verschuur, p. 88, n. 1).

Sexagius, the Belgian spelling-reformer, 1576, uses u for the vowel, v for [w] (except where it follows a consonant, where he uses u), and the emperor Claudius' inverted F (digamma) for [v]. He does not use the symbol w.

Madsen fills 52 pages (p. 174 - 225 of Book II of 'De Literis', 1586) to prove that the traditional belief in the existence of diphthongs is the consequence of there not being special figurae for j and v. It is impossible to pronounce two vowels in one

syllable, let alone three. The so-called diphthongs and triphthongs are combinations of one vowel and j and/or v preceding and/or following that vowel. The same opinion was expressed in the twelfth century by the First Icelandic Grammarian (see Haugen's edition, pp. 18 and 36).

Madsen is responsible for the modern Danish -j and -v spellings in diphthongs.

Gataker, 1641, follows Madsen in his interpretation of the second element of diphthongs as consonants, and is followed in turn by Wallis (for similar interpretations in modern times see Bloch and Trager, 'Outline of Linguistic Analysis', Baltimore, 1942, p. 23; Hockett, 'A Course in Modern Linguistics', New York, 1958, pp. 31 f, and others, and cf. Firth, Sounds and Prosodies, Papers in Linguistics, 1957, p. 132 on 'y' and 'w' diphthongs).

Wilkins (1668, p. 370) disagrees with Madsen and Gataker, but admits that i and u 'do...approach very near to the nature of Literae clausae, or Consonants'.

Holder (1669, p. 93,) states that 'Diphthongs are compounded with i, u or  $\text{v}$ ' ( $\text{v}$  is the vowel heard in the word 'two'), the latter sounds 'then supplying the place and nature of consonants'.]

They include among the 'vocales' short ones, which are single, and long ones, which are in fact double letters, consisting of a vowel and a consonant. Diphthongs, however, are excluded, though they consist of two short or single vowels.

In this way the name of vowel is made into a very odd genus, which cannot be described by a 'Definitio reciproca', i.e. one which comprises neither too little nor too much.

[ On Definitio reciproca seu καθ' ὅλου πρώτη, κατὰ παντός, καθ' αὐτό, see Ramus, Scholae Grammaticae, Paris, 1564, pp. 5 v ff; Madsen, De Literis II, p. 189; Acta Jutlandica III, 1, pp. 35 f and 228; cf. Alsted, p. 425: Definitio (perfecta) reciprocetur cum suo definito: h.e. non sit latior...nec angustior...

See also Burgersdijk, p. 147; Keckermann, p. 656.]

I shall refrain from mentioning the confusions in the 'semi-vocales' and 'Mutae'.

Montanus then proposes the following redefinition of the traditional terms.

Vocales = Montanus' Free Sounders

Vocales Breves = Single free sounders

Praevocales or vocales praesonantes ) are the ones which sound  
or vocales praepositivae ) highest in the syllable (i.e. the snap-vowels) (p. 88).

Subvocales or vocales consonantes are the steady free-sounders, which may continue to bear the traditional name of Vocales Subiunctivae when they follow the snap-vowel, as they usually do.

[ On vocales praepositivae and subiunctivae, i.e. the accented and unaccented elements of diphthongs, see Priscian I, ix, 50 (Keil II, p. 37). The Latin grammarians used these terms to render Greek προτακτικά and ὑποτακτικά. Diphthongs arise out of the κρᾶσις of these two.

Cf. Wilkins, p. 370, on y and w 'preposed' and 'subjoyned' in diphthongs.

In Greek and Latin grammar these and similar terms were not only applied to vowels, but also to consonants, syllables, words, and even sentences to express the opposition independent/dependent. This is how the notion of syntax arose (cf. K.E.A. Schmidt, pp. 81 ff; Gräfenhan, I, 442; Steinthal II, pp. 195 f, 200, 229 f; Jeep, p. 114,).

It seems probable that Montanus' immediate constituent analysis of letters, syllables, words, word groups and sentences into 'principal and less principal halves' was directly or indirectly inspired by these Greek and Roman procedures.]

'Consonants' are no longer to be looked upon as the cognate species of 'vocales', but of 'Praevocales'.

[Cf. Pike's distinction between vocoid and vowel, contoid and consonant, Phonetics, 1943, esp. pp. 143 ff.]

'Semivocales' are the sounds of the second, third, fourth, and fifth degrees.

'Mutae' or 'Aphona' are those of the lowest degree.

The latter should really be called deaf- or dull-sounders, because it is an error to believe that they are completely mute and without sound of themselves. They have the property of changing easily and frequently into one another, not only in Greek, but also in other languages, especially in ours. They may, therefore, be called 'Mutabiles', and the others 'Immutabiles'.

In the Appendix (pp. 162 f) he says that he now considers it better to apply the terms Mutae or Aphona to the chokers (=plosives) only, because the Greeks use the term Aphona in that sense, except that with them the 'Aspiratae', which consist of a choked

and a free letter, are also included among the 'Aphona'. The Romans use the term *mutae* for the plosives and for *g* and *f*, which are 'now' (he means: in Dutch) free letters. *g* (like *c* in all positions) was originally a plosive and was therefore rightly classed as a *Muta*. But now that the the sound of *g* has changed, people have unwisely allowed it to remain under that genus, as also, at least in part, *c*. Or *g* was included among the *Mutae*, because it was wrongly identified with Greek  $\gamma$ . (It should be remembered that to Montanus  $g = [\gamma]$  and  $\gamma = [g]$ ).

*F* probably got among the *Mutae*, because the symbol by which it is represented is derived from  $\gamma$ , consisting as it does of two  $\Gamma$ 's, one placed on top of the other. Therefore, they have foolishly placed it under the same genus as  $\gamma$ . Those who do not consider it a *Muta* are right.

[ On *F* consisting of two gammas, see the quotation from Cassiodorus on p. 66 of Sturtevant; Priscian I, iv, 20; Madsen, p. 91. Cf. Alsted, p. 267: *F* vocatur digamma, quia ex duplici gammâ conflata est.

The real reason why so many of Montanus' predecessors and contemporaries included *f* among the mutes is, of course, that Priscian had done so (Priscian I, iv, 12 ff and I, v, 25 f; Keil II, pp. 11 f and 19 f).

Priscian equates Latin *f* with Greek  $\phi$ , which though still often classed with the  $\acute{\alpha}\phi\omega\nu\alpha$  ( $\delta\alpha\sigma\acute{\epsilon}\alpha$ ), had by Priscian's time developed into a fricative. For a convenient summary of Priscian's other arguments in I, iv, 13, II, i, 8 and I, v, 29, and Scaliger's counter - arguments ('De Causis linguae Latinae',

Lib. I, Cap. 15); see Madsen, De Literis II, pp. 148 ff. See also Jellinek II, pp. 27 f; Allen, India, pp. 36 f.]

(p. 88 ctd.) It is customary to divide the Semivocales into Liquidæ, called Immutabiles by the Greeks, and their cognate species the Duplices and s, Monadicon or Asemon, the locked-out sheep wandering by itself, which could not find a place under the other genera.

[Diomedes: 'littera suae cuiusdam potestatis' and therefore called μοναδικόν (quoted by Jeep, p. 114). For a long time s was in bad repute. Messala wrote a treatise against it. Dionysius of Halicarnassus calls it unattractive. It is often referred to as the serpent's letter. Ceratinus, 1529, compares it to the sounds made by geese, serpents, etc. Mekerchus, 1544, says: Monadikòn, id est Solitarium, unum σ, quod ab aliis ἄσημον, hoc est sine signo, vel ignobile vocatur (Havercamp, Sylloge I, pp. 370 and 114).]

Others divide the Liquidæ into Acutæ and Obtusæ and place the Firmæ (j, v, f) beside the Liquidæ as a cognate species, wrongly counting s not only among the semivocales, but even considering it to be the first of the liquidæ, and making the duplices into a separate species.

Montanus proposes the following use of these terms:

Semivocales may be divided into two species, 1. Firmæ, 2. Liquidæ. The Firmæ are the letters of the second degree (the steady vowels), which may be called firm, because they are always firmly united to the preceding snap vowel without any intervening glide.

(Montanus adds that there is no glide, because steady vowels only combine with letters of the same form; a, j and w are occasional and accidental exceptions to this rule.)

The Liquidae are the other Semivocales, i.e. the letters of the third, fourth, and fifth degrees. They may be called melting letters, because they and the mutae standing outside them in a syllable melt together into a double letter, and chiefly because by thus depriving the neighbouring syllable of the mutae, they shorten or melt it.

The Semivocales of the third and fourth degrees may be called Acutae, and those of the fifth degree Obtusae.

(p. 89) As it is customary among the Greeks to subdivide the Mutae into three species of three letters each, viz. Tenues ( $\kappa, \lambda, \tau$ ), Mediae ( $\beta, \gamma, \delta$ ), and Aspiratae ( $\phi, \chi, \theta$ ), these subdivisions may be redefined and retained in the following manner:

The Aspiratae should not be in the same genus as the single ones, but go under the Double letters.

The Mutae may be divided into the remaining two species

1. Mediae (heavy):  $\gamma, d, b, g, z, v$
2. Tenues (light):  $k, t, p, ch, s, f$ .

Pages 89 ff contain tables showing, besides the traditional division, that of Ramus 'and many others' and Montanus' own provided with his terms and the old ones redefined.

On pages 99 ff he returns to the question of height or loudness of sound.

Two letters of the same degree, when combined in a syllable are said to be equally loud, e.g. rr, ll, ngng, nn, mm (long letters of one form and one breathing); mn, zd, dz, kt, pt, cht, st, ft, sp, sch (= [sx]), ks, ts, ps, chs (= [xs]), fs, pf (double letters of two forms and one breathing).

It is a characteristic of combinations of equally loud letters that they can be used as syllable-initial and as syllable-final clusters without the order of the letters being reversed, e.g. psalm and hups.

[ This apparently is meant as a general phonetic statement. On reversibility of Dutch clusters see below.]

(p. 100) Combinations of two letters of different degrees are referred to by the confusing term climbing, which means either rising (such as ja, we, tr, sm, kl) or falling (aj, ew, rt, ms, lk).

In Chapter XIX, which deals with double letters as matter of the third parts of syllables (i.e. grounds, front- and back-cleavers) he tells us that double ground-letters are always either falling or rising, because they are snap + steady or steady + snap.

(p. 101) The following two-member front-cleavers occur in Dutch: wr, gr, gl, gn, vr, vl, dr, br, bl, sl, sn, sm, sch, st, sp, fr, fl, kr, kl, kn, tr, pr, pl.

[ From this Dutch list, which, as he states expressly, ignores combinations which arise through 'mixture' (i.e. which open with proclitic [k], [g], [t], [z], etc. for [ik], [ig], [het], [dez], etc.), he correctly omits such groups as

zd, dz, kt, pt, cht, ft, ks, ts, chs, fs, which occur in the list of reversibles on page 99. He also omits ps of psalm (his example on p. 99), probably because it only occurs in Greek loan-words. Verschuur (p. 159) points out that fn is missing.]

They are either equally loud or rising, but never falling.

Two-member back-cleavers can be of one form (e.g. nn, ll, etc. Montanus provides no examples here, but he does in the table on page 102) or of two forms. The two-form back-cleavers occurring in Dutch are: rg, lg, rz, lz, nz, dz, rv, lv, ry, ,ny (= [ŋg]), by, rd, ld, nd, md, gd, zd, vd, bd, rj, rw, rl, rn, rm, rch, rs, rf, rk, rt, rp, lj, lw, lm, lch, ls, lf, lk, lt, lp, ngs, ngs, ngk, ngt, ns, nt, ms, mt, mp, chs, cht, st, sp, fs, ft, ks (or x), kt, ts, ps, pt.

They are either falling or equally loud, but never rising.

When the order of the letters in these syllable-final combinations is reversed, they can be used as syllable-initial clusters, just as the two-member initial clusters can be final in reverse order. Cf. praeten and harp. When reversed the rising double letters become falling, the falling become rising, and the equally loud remain equally loud.

It should be added that all double front-cleavers in reverse order are fit to be used as back-cleavers, but some back-cleavers are less fit to become front-cleavers, because a ground can enter into closer junction with a back-cleaver than with a front-cleaver. The explanation of this phenomenon is that the clearness (i.e. sonority) of the sound of the ground is, to a certain extent, imparted to the back-cleaver, and not to the

front-cleaver, and falling and 'snapping off' in a syllable is easier to accomplish than rising and 'snapping to'. From this follows the property or rule that the same letters (p. 102) have a stronger sound as back-cleavers than as front-cleavers.

On page 102 he prints a table of two-member consonant combinations, which may occur initially and/or finally in a syllable, to which he adds the following notes on page 103:

1. The letters in the top row or rank indicate the inside and higher sound of the cluster, while the letters standing against the columns or files indicate the outside and lower sound of the cluster.

(This is not quite true, as the table contains a good many combinations of his 'equally loud' consonants)

2. In each square the letters on the left indicate front-cleavers, those on the right back-cleavers.

3. The squares containing an o cannot be filled, because a letter of a higher degree cannot stand outside one of a lower degree. The squares containing a ˆ (in the table the sign ˆ is used) cannot be filled either, because a heavy letter does not combine very well with a light one without the one being assimilated to the other in heaviness or lightness (see above, 5.3, p. 119, on 'heavy' and 'light'). Most of the other empty places can be filled with front- and back-cleavers, which, however, either do not occur at all, or are rarely used in the ordinary languages (de gemeene Taelen).

4. The letters printed in italics are not used in Dutch (except when mixed, i.e. when one of them is a proclitic [he seems to forget that t and k could also occur as enclitics, e.g. zet 'k, hak 't], but they are in other languages such as German (as in pfenning, halb, lamb), Greek (as in bdellium, pneuma, Ptolemęus, psalmos, tmesis), and English (grey, glat), and so on.
5. Several which occur in writing are not printed here, such as gt, gs, dt, ds, bt, etc., because they do not occur in speech. (They represent [xt], [xs], [t], [ts], [pt] respectively.)

The table on page 102 bristles with misprints, not all of which are pointed out in the list of corrigenda on page 30 (Inl.). Thus gn in the top row means ng, and ny, nk in the column below it should read ngy, ngk. For initial ts read st. This time he includes combinations containing proclitic [t], [k], [g], [z] among the initial clusters, but does not do so very consistently. For instance 'tn and others are printed in normal type and with the apostrophe, but tl and tm are printed in italics, and γm, γn, etc. are not given at all. According to his fourth note on page 103 they should all have been there in italics.

The final clusters np, mn (both given as Dutch), γz, bz and sch, which did not appear in the table on page 101, are now included, but by and lj, which did, are not; final pp is erroneously printed in italics.

Why Montanus thinks that -rb, -lb, and -mb could not occur finally in syllables in Dutch is not clear.

(p. 106) His examples of triple equally loud letters on page 106 are: tst, sps, spt, chst, tsch in hy quetst (pres. indic. 3rd pers. sing. of the verb quetsen, consisting of the stem quets and the bound morpheme -t)

'tstaet (pres. indic. 3rd pers. sing. of the verb staen, in which the verb is preceded by the proclitic personal pronoun 't)  
des gesps (genitive of the noun gesp)

'spsalms (genitive of the noun psalm, in which the noun is preceded by the proclitic genitive of the definite article)

hy gespt (pres. indic. 3rd pers. sing. of the verb gespen, consisting of the stem gesp and the bound morpheme -t)

slechst (superlative of the adjective slecht, in which the adjective has lost its final -t before the bound morpheme -st)

'tschijnt (pres. indic. 3rd pers. sing. of the verb schijnen, in which the verb is preceded by the proclitic personal pronoun 't)

Rising triple letters have the letter or letters of the highest degree at the end, as str-, spl-, schr-.

Falling triple letters have the lower letter(s) at the end, as -rst, -rts, -lps, -rlt (and -aaj, -eew, -eee).

Rising-falling triple letters have a ground-letter of the first degree in the middle, e.g. jej, jij, wej.

In Chapter XXI, which deals with the triple letters as third parts of syllables (i.e. grounds, front- and back-cleavers) the triple cleavers of one breathing are divided into front-cleavers (p. 107) and back-cleavers.

If we exclude groups of which the first member is a proclitic, Dutch has four triple front-cleavers, viz. *schr-*, *str-*, *spr-*, and *spl-*, but German has six more, viz. *schl-*, *schn-*, *schm-* (!), *pfr-*, *pfl-*, *pfn-* (the example of *pfn-* is *Pfnüssel*).

(*Pfnüssel*, a Swiss word for cold in the head, nose; nasal catarrh).

By admitting proclitics the number of Dutch groups can be added to considerably e.g. *sfr-*, *sfl-*, *skr-*, *kfr-*, *kfl-*, *tchl-*, *tchr-*, *tkr-*, *tkl-*, *tkn-*.

In all these triple front-cleavers the first two letters are of the lowest degree, and the group is never falling.

The Dutch triple back-cleavers all originally consist of double back-cleavers with either *s* or *t* added. There are about twice as many triple back-cleavers as double ones, since out of any double not ending in *s* or *t* two triples can be made. In his examples *-rps*, *-rpt*, *-lps*, *-lpt* *s* and *t* are bound morphemes.

He has added the word 'originally' to the above statement, because, as a result of assimilation, or change, as he calls it, a group like *-lfs-* or *-rst-* may change into *-lvz-* or *-rzd-*, e.g. *Delfsbier* > *Delvzbier*, *geherst-broot* > *geherzd-broot*.

(p. 108) Triple back-cleavers are never rising. The rules for the reversal of the double front- and back-cleavers also apply to the triples.

Quadruple front-cleavers always open with proclitic *s*, *k*, or *t*, e.g. *'sschrifts*, *'kstrij*, *'tspreect*.

They are never falling and in reverse order they can be used as back-cleavers cp. *'tspreect* and *scherpst*.

However, not all the groups that can thus be made are actually (p.109) used. The most usual in Dutch all end originally in -st, apart from two which end in -ts/ (e.g. werlts, des Elfts, helfts).  
 ↙ viz. -rlts, and -lfts

The light letters may change into heavy ones, as in hervzd-draen for herfst-draen.

Quadruple back-cleavers can be made from double ones by the addition of -st to the latter, e.g. scherp(st), wulp(st), (both superlatives; the latter example is not correct; the positive is wulps(ch), not wulp), ic help, duu helpst (pres. indic. 2nd pers. sing. of the verb helpen).

There are as many quadruple back-cleavers as there are double ones.

Quadruple back-cleavers are never rising. In reverse order they can be front-cleavers (always opening with proclitic t).

[ It is clear from his exhaustive listing of the possible syllable-initial and -final combinations of consonants that Montanus did not underestimate the importance of this part of phonological analysis at the syntagmatic level. It must be pointed out, however, that others had preceded him in this, though not on such an elaborate scale. He may have been inspired by his countryman Van der Schuere, of whose modest little treatise on spelling (1612) the recurrent statements about possible combinations are the most striking feature (see Nederduydsche Spellinge, ed. Zwaan, esp. Intr. p.xvi), or else by Meigret or even directly by Priscian, who himself was no doubt following Apollonius Dyscolus in this as in so many other respects.]

Note to Chapter X

1. See L. Roudet, *Éléments de Phonétique Générale*, Paris, 1910, p. 149, on Homeric Greek  $\pi\tau$ , which was perhaps a linguo-labial stop.

CHAPTER XINUMBER, ORDER, AND JUNCTION

(p. 91) The single letters as matter of syllables have other properties besides that of height of sound, viz. number, order, and junction.

There can be from one to seven letters in a syllable, and hence a letter may be the first, second, third, etc. in a syllable. Montanus provides three alternative sets of names to indicate the place of the letters in a syllable.

(p.92) Junction of letters in syllables is of two kinds.

There may be direct contact between the grounds of the letters joined. This happens when the letters are of the same form, such as the snap and steady e's in eet or the two t's in spott. In this case the letters are said to be welded together. Or there may be an audible glide between the two grounds, as, for instance, between the r and m of arm and the ch [x] and t in acht. In such cases the letters are said to be seamed together. Junction of letters in a syllable is indicated in writing by placing their symbols close together (Inl. p. 27).

Letters pronounced by themselves, i.e. not joined to any others in a syllable, are said to be loose.

Those which are joined to others in a syllable are bound letters. They may be bound on one or on both sides. Appropriate names are provided for the various types of bound letters, indicating whether they are preceded and/or followed by other letters in the same syllable.

(p. 93) Like letters (cf. Bk. I, p. 28), syllables can be divided into a ground and one or more cleavers. A letter which is the matter of a syllable-ground (i.e. the syllabic sound) is called a ground-letter. It is always a free sounder, whether snap or steady, and all the free sounders in syllables are ground-letters, except that w standing outside r is sometimes to be regarded as a cleaver. The same applies to a certain extent to j.

(p. 94) Only the free snap-vowels can by themselves constitute the whole matter of a syllable-ground. Those which most often do so are snap a, e, o, u ([ɑ], [e], [o], [ʊ] or [æ]).

A snap letter which forms a syllable-ground may be called a onesome.

A twosome made up of snap e and steady j occurs in zeit, jent [zejt], [jent]; a threesome made up of snap a, steady a, and steady j is found in draajt, jaa [dra·jt], [ja·].

Foursomes are not much used.

The cleavers can also be divided into onesomes, twosomes, etc.

All the not-free-sounding letters can be either front-onesome cleavers, in which case they may be referred to by such names as ree, lee, ngee, nee, mee, gee, etc.; or back-onesomes, which may be called er, el, eng, en, em, eg, etc., when pronounced short.

t and r form a twosome in the syllable-initial group tr-, and in the syllable-final group -rt. Similarly str-, -rts, and -rst are threesomes. -rlts in werlts (i.e. the genitive of werlt = world) (werlts is monosyllabic according to Montanus, cf. p.84) and tschr [tsxr] in 'tschrift (in which 't is the weak form of the neuter definite article) are foursomes.

CHAPTER XIITHE SYLLABLE

(Montanus, Book III)

(p. 111) The second species of speech is the word member.

A word member is a speech which contains a free snap-sound.

[ Brief as it is, this definition contains two elements familiar to modern phoneticians, viz. a chest pulse and a peak of sonority, both being implied in the term 'snap-sound' ( see above, 5.5, pp. 127 f)].

Of all the terms that Montanus has been able to think of to translate the Greek word συλλαβή word member pleases him best, (p. 112) because 'these hill-like parts of words',<sup>1)</sup> resemble the members of the human body, and the term also indicates that there is the same relation between a syllable and a word as there is between what he calls a 'sentence member' and a sentence.

The syllable may be looked upon as a species of the genus 'snap-voices', by which he understands all the 'voices' which are produced with a jerk of the breath, i.e. which comprise a letter of the highest degree of loudness.

As we have seen, a letter of the highest degree is always a snap-letter, but it need not be a free snap sounder, i.e. snap-vowel. The s in the interjection [st], meaning 'be silent!' (cf. English [ʃ]), is a not-free-sounding snap-letter. (See above, 5.5, p. 130.)

A six-foot iambic verse, which in translation runs:

'I addressed the mute; his reply was mm mmm', provides another example of a not-free-sounding snap-letter; mm and mmm both function as syllables, and they each contain one snap-m, the other m's being steady.

As he has defined a syllable as a word member which contains a free snap-sound, 'mm' and 'mmm' in the above example are not true syllables, and, therefore, he has to set up the genus of 'snap-voices' to accommodate both them and 'real' syllables as cognate or co-ordinate species.

[His term is 'neevegaende Soorte', in which Verschuur (p.165) wrongly sees an anticipation of Sievers' 'Nebensilbe'.

Verschuur is, moreover, misled by a misprint. He takes 'des' in the passage 'ende tot een neevegaende Soorte des Woordleeden' to mean 'der', though in the list of Corrigenda on page 30 (Inl.) it is pointed out that this should read 'de'.]

Syllables can be divided into halves. The less principal half consists of the initial consonant or consonant-cluster. The number of initial consonants may vary from zero to four. [He says from one to four, but points out that a syllable can exist without a less principal half.]

(p. 113) The principal half consists of the snap-vowel and the letters following it.

On page 117 he refers to the principal half as the louder half.

The number of the letters following the snap-vowel varies between one and four.

In Chapter II he divides the syllables into third parts.

The principal third part is the ground, which consists of the snap-vowel and the free sounders joined to it. The addition of the phrase 'joined to it' excludes the free-sounders standing outside not-free-sounding letters, such as w in wreet, verw, which is separated from the ground by r (but w in zwaajt is part of the ground -waaj-).

The ground may consist of from one to four letters.

(p. 114) The less principal third parts are the front- and back-cleavers, i.e. the initial and final consonant clusters.

(p. 115) In Chapter III we learn that a syllable may consist of from one to seven or eight letters. One-letter syllables consist of one letter, viz. a free snap-vowel. Examples of seven- and eight-letter syllables are provided by stercst and 'tschrjft <sup>2)</sup>, respectively, the latter opening with proclitic [t].

Syllables consisting of a ground only are said to be naked or bare. Those which have one or two cleavers as well as a ground are clothed, i.e. half clothed or fully clothed.

(p. 116, Chap. IV)

The properties which syllables have in themselves, i.e. not as the matter of larger units, are quantity, height and change.

Syllable-quantity depends largely on the number of letters of which they consist, though it may be affected, to a certain extent, by the length of the junction of the letters. Syllables which consist of one or two speech-letters are short;

those which consist of three are moderately long or doubtful; those which consist of four or more are long.

It is also possible to distinguish seven or even eight 'measures or times of length', according to the number of (p. 117) letters; but for practical purposes it is sufficient to distinguish only two, viz. short and long, as it is customary to consider the quantity of the principal half only, which is the louder and which is pronounced and heard last.<sup>3)</sup>

A short syllable is one whose principal half consists of not fully two speech-letters.

In this short description are contained all the rules which the grammarians have made, without knowing the causes, for the recognition of short syllables, such as:

a vowel preceding another vowel makes a short syllable in Latin; a short vowel followed by a Muta and Liquida in the same syllable <sup>4)</sup> is of doubtful quantity in poetry, but is usually short elsewhere.

In these cases the principal half consists of not fully two speech-letters.

A long syllable is one whose principal half consists of two or more letters.

I am referring to spoken and not to written letters. It should be remembered that many double speech-letters are normally represented by single letters in writing. In *meeten*, *zitten*, *herten*, the first syllables are long, because their principal half consists of two letters, though meeten is often written meten.

It is in this way that what the grammarians call 'Positio' makes the syllables long, as im- in imperator, ac- in axis, -mus in cupimusque, in-in invetitum. Similarly a diphthong or a long vowel (i.e. snap + steady in that order) makes a syllable long, as Cae-in Cæsar, vij-in vjlen.

We shall postpone a more detailed discussion and demonstration of the above till a later date.

Height in syllables is of four kinds:

1. There may be a single peak. This occurs in one-letter syllables, e.g. `è in edoch.
2. There may be rising height. This is found in syllables which are clothed in front, but not at the back, including those which have a one-letter ground, such as dè, and bè in beminde.

(p. 118)

3. The height may be falling. This occurs in syllables of more than one letter which consist of a principal half only, such as ìj, òo, àl, àert, èens.
4. There may be rising-falling height, which is found in the fully clothed syllables, e.g. jàe, wàej, dwàel, zàel.

[His treatment of w and j is most inconsistent. On pages 113 f -waaj (-waei-) is specially mentioned as the four-letter-ground of zwaajt (zwaeit), which fits in with his example of 'quadruple ground-letters, which are the matter of the four-letter-grounds of syllables' on page 108. This would certainly make wàej a naked syllable. Here, however, it and jàe are treated as fully clothed.]

(p. 118) In Chapter V we are presented with a bewildering mass of heterogeneous material which is meant to illustrate change, i.e. the third property of syllables considered in themselves.

Montanus introduces dozens of ingeniously devised technical terms both to name his own newly discovered categories and to render the traditional Greek terms used by the rhetoricians to indicate the various types of metaplasma, μεταπλασμός.

[This section and the one on change in words (see below) constitute the most archaic feature of Montanus' book.

The study of the πάθη τῆς φωνῆς and πάθη τῶν λέξεων or the affections and accidents of letters and words was part of the Græco-Roman heritage and had loomed large in grammatical treatises from the first century B.C. onwards.

It seems to have been inaugurated by Tryphon (cf. Steinthal, I, p. 347; Sandys I, p. 143) and through the works of Varro, Quintilian, Apollonius Dyscolus, Terentius Scaurus, Terentianus Maurus, and Priscian, it came to occupy a prominent place in sixteenth- and seventeenth-century grammars written in Western Europe, where it was reinforced by the study of Hebrew (see The Jewish Encyclopedia, p. 602 on the belief that the permutation of the letters with which God created heaven and earth could work miracles (Sefer Yesira)).

Sections devoted to this branch of primitive linguistics are to be found in the works of the French orthographers Tory, Sylvius (Dubois), Dolet, Ramus, and the Estiennes, and in those of the German writers Aventinus, Clajus, Albertus, and

Oelinger.

In 1606 Estienne Guichard wrote a book entitled 'l'Harmonie étymologique des Langues Hébraïque, Chaldaïque, etc.' which deals with etymological derivation 'par addition, subtraction, transposition et inversion des lettres' (see Jellinek I, p.27; Benfey, p. 232).

As late as 1860 S.S. Haldeman (Analytic Orthography, Philadelphia, pp. 50 ff, 62 ff) operates with such categories as epenthesis, ecthesis, anathesis, eiseresis, commutation, permutation and transmutation.

A good many of Montanus' Latin illustrations of sound pathology occur in Alsted's Encyclopaedia (see esp. pp. 268, 341) and some of the Dutch ones are to be found in Van Heule, 1625/1626 (see Caron's ed. of Van Heule I, pp. 66 f, De Figuris Dictionum).]

A selection from his numerous examples may give an idea of the tone which prevails in this chapter.

Thesej for Theseï, and Iesus for iësus illustrate Synæresis or Episynalæpha, in which the matter of two syllables is given one form, so that the total number of syllables is reduced.

Weerelt or werrelt for werlt, verruw for veruw, aulaï for aula, illustrate diæresis, which is an increase in the number of syllables as a result of one syllable assuming one or more additional forms.

(p.119) Diastole or Ectasis (lengthening of a ground-letter) is illustrated by Dīana for Dĭana and two Dutch examples.

Goej for goe is one of his examples of Parenthesis, i.e. extension of the ground of a syllable by the addition of one or more letters of a different form or different forms. Latin bos for Dutch os [he believes, of course, that the Romans took the Dutch word 'os' (ox) and put a b in front of it. There is no connection between Dutch os and Latin bōs], Flemish haerde, nijver for aerde, ijver, Italian Giouanni for Ioannes are examples of the addition of a front-cleaver to a half-clothed syllable.

Poetical stressing of a normally unstressed syllable results in lengthening of the back-cleaver, i.e. doubling of the final consonant.

Lengthening of the front-cleaver is heard in man pronounced hesitatingly as mmman.

Parempsis is the addition of one or more letters to a back-cleaver, as in mensch for mens, or to a front-cleaver, as in gnatus for natus, pfenning for penning, pflegen for pleegen, schlaff, schneppf, for slaep, snip etc.

Some of the examples in the category of 'addition' just illustrate inflectional endings.

(p. 120) Systole, which is shortening of a ground-letter, is illustrated by stetĕrunt for stetĕrunt and a number of Dutch examples.

Ellipsis is loss of a ground-letter. The examples are of the type vloet for vloeit.

French estape for staepel is an example of loss of a whole final cleaver, and Flemish ulpe for hulpe shows loss of a

whole initial cleaver.

So do Latin uvæ, urbs for druuve, dorp (!)

Ectlipsis is loss of part of a cleaver, as mart for marct,

Latin latus for bljide.

Metathesis is illustrated by a long list of examples, of which a surprisingly large number are correct. In this list he pairs lupus and wolf, and vloo and pulex, which most modern etymologists still look upon as related.

On page 121 he prints word pairs which differ in their ground-letters, most of which are dialectal or social variants of each other, but some of them are tense-forms of strong verbs showing ablaut. The list ends with meer - mare; coper - cuprum (i.e. cyprum, Late Latin cyprum).

On pp. 121 ff he deals with the commutation of cleavers, which is of two types, one of which he divides into fifteen sub-types (see the table on p. 121).

The most usual kind of commutation in all languages, and especially in ours, is of light (i.e. voiceless) consonants with heavy (i.e. voiced), and sounds of the sixth degree (i.e. voiceless and voiced fricatives and plosives) tend to interchange with sounds which have the same depth (i.e. place of articulation).

He illustrates the following changes, which he arranges according to his fifteen sub-types:

g > ɣ (i.e. [ɣ] > [g]) (this is constantly done by the English (p. 121)), ch (= [x]) > k, s > t, f > p, g > ch (= [ɣ] > [x]), z > s, v > f (the Frisians usually pronounce s for z, and f for v (p. 122)), ɣ (= [g]) > k, d > t, b > p, g (= [ɣ]) > k, z > t, v > p, d > s, b > f, r > l, l > n, ng > g (= [ŋ] > [ɣ]), n > z, m > b, n > d,

ng > ch (= [ŋ] > [x]), n>s, m>f, ng (= [ŋ]) > k, n>t, m>p,  
r>n, r>z, r>s, r>d, r>t, l>z, l>s, l>d, l>t.

The consonantal alternation in the Dutch word-pairs among his examples is mostly due to assimilation, or to Auslaut-Verhärtung (i.e. the unvoicing of word-final consonants), or to the WGmc change of z (<s by Verner's law) to r (cp. English lose/forlorn), or to the preservation of PrGmc [xt] beside [k] in other forms in the paradigm (e.g. zoek, zocht; werk, wrocht, cp. the spelling of English seek, sought; work, wrought).

Most of his Dutch-German examples show the effects of the second sound-shift in Old High German.

His f > m example 'Geemme' for 'Geef mij' (cp. (one type of) English 'gimme' for 'give me' is meant to illustrate the change of m to f. This is one of many instances where the direction of the change is wrongly indicated.

The Latin and Greek examples show the well-known consonant changes in declension and conjugation, or assimilation of prefixes to root-syllables.

A large number of the words in his Dutch-Greek and Dutch-Latin pairs are actually etymologically related, e.g. vier (= vuur; English fire), πῦρ; veel, πολύς; nevel, nebula; acht, octo; neef, nepos; dac, tectum; knie, genu; gordijn, cortina; acker, ager; spiegel, speculum; vis, piscis; vaeder, pater; varken, porcus; voeten, pedes; taefel, tabula.

The few French-Latin relations which occur among the examples are also correct.

However, a great many of the words paired by him are unrelated, e.g. Dutch kind and English child, and his fundamental error

throughout is, of course, that he makes Dutch his starting-point, believing with Goropius Becanus and Simon Stevin that the words in Latin, Greek, French, English and other languages are modifications, if not corruptions, of the Dutch ones.

(p. 123) The examples of the interchange between a ground-letter and a cleaver include:

l/w: Dutch words in -eel, and French words in -eau (the Dutch words were actually borrowed from French -el forms).

w/v: Dutch w-words and Latin v-words. Four of his five pairs are related. If his Dutch w was really bilabial, it was probably identical with Latin v.

j/l: Latin clarus, flos, Italian chiaro, fjore.

j/ch: Dutch dach, wech, wachten, English daye, way, vvayte.

A single change may belong to more than one species, e.g. 'twelc for het welc is an example of synæresis or 'syllable mixture' (i.e. composition), since two syllables are made into one, but it also illustrates the addition of a cleaver.

(p. 124) A change like werk/vrocht (cp. p. 120 wrocht)<sup>5)</sup> is complex. It consists of three letter-changes (w > v, e > o, k > ch), metathesis of r, and the addition of a letter (t). (Chap. VI, p. 124)

The properties of syllables not considered in themselves, but as matter of words, are height of sound, number, order and junction.

(p. 125) The degrees of height are what are usually called accents.

In every word there is one syllable, the upper-word member,

which surpasses the others in height. It has the highest degree, the upper-word-member degree, which is either sharp (Accentus acutus) or lingering (Accentus circumflexus).

The acute accent is produced by a sharp or rapidly falling jerk of the breath.

The circumflex accent is produced by a jerk of the breath followed by a steady breath of which the height remains constant, or: a jerk of the breath which (? falls and then) continues at the same height ('een hort des Aesems, en volgende geduerichheit, zeer in gelijke hoochte'. Zeer = much = very nearly ?).

All the other syllables in a word sound lower than the upper-word member. They may be called lower-word members and they have lower-word-member degrees of height (Accentus Graves). The graves can also be either sharp (acute) or lingering (circumflex).

The traditional marks are employed to indicate the acute, grave, and circumflex accents. On page 27 of the Introduction Montanus points out that a mark indicating an upper-word member, upper word, upper slice, or upper-sentence member (on which see below) implies that the letter over which it is placed is a snap-vowel, so that it is unnecessary to add the mark for snapping (") as well.

On the same page he says that once the upper-word member has been indicated by an accent, it is not necessary to mark the lower-word members. (The same applies to lower words, lower slices, and lower-sentence members.)

In the examples on page 125, however, the lower-word members

are marked, but no distinction is made between lower-word-member acutes and circumflexes. They all have graves. The examples of upper-word-member acutes are all (with one exception, which is probably due to error <sup>6)</sup> ) on short snap-vowels in closed syllables; the circumflexes are on snap + steady vowels in open or closed syllables. Probably the graves on snap + steady (= long) vowels should also be interpreted as circumflexes.

As far as I can see, there is no distinctive marking of acute and circumflex upper-word members except on page 125. All the snap + steady vowels in the examples on pages 129, 131 ff have acutes instead of circumflexes.

Throughout the book there is great inconsistency in the use of acute and grave accent-marks, for which no doubt the printer should be blamed.

A 'jerk of the breath which falls' or 'continues at the same height' is a little difficult to understand, but it appears likely that Montanus is here thinking in terms of 'voiced breath', and that 'height' refers to pitch as well as to loudness.

Terms like 'pitch' or 'tone' do not occur anywhere in Montanus, and in the sections dealing with 'height of sound of the letters in the syllables' (see above, Chapter X), 'height' is expressly identified with 'loudness', but it is reasonable to assume that for Montanus 'accent' implied a change in pitch as well as stress. His notions about the relation between pitch

and stress were certainly even vaguer than ours.

His definitions of acute, circumflex, and grave suggest influence of the theory of the Greek accents, which were (and are) usually defined in terms of 'raising and lowering of the voice'.

Pernot, *Revue de Phonétique* 5, pp. 178 ff, even interprets Montanus' 'height of the letters in the syllables' (=sonority) as 'la hauteur musicale, l'acuité', and there is no doubt in the minds of Verschuur, pp. 39, 168, 194, and Guittart, *De Intonatie van het Nederlands*, Utrecht, 1925, pp. 13 f, and *English Studies* IX, p. 6, that Montanus' 'climbing or height of words, sentence slices and sentence members' (on which see below) is concerned with pitch variation.

It cannot be denied, however, that all Montanus' remarks on 'height' are ambiguous. An interesting passage occurs on page 27 of the Introduction, in which he explains that the placing of the acute accent over (the second) e in betréffen indicates that in that letter 'the peak of sound' is reached, and that there is a rise before it, or rather, into it, and a fall after it, or rather, away from it. The sound rises in tr or tre, is highest in e, and falls in f or ef.

(p. 126, Chap. VII)

In Chapter VII of Book III Montanus discusses the other properties of syllables as matter of words.

He does not here state the maximum number of syllables to be found in one word, but on page 132 he mentions as an example

of an eight-syllable word irreprehensibilité<sup>7)</sup> (cf. M.p.129). In the present chapter he provides names for syllables according to their number in words: 'onesomes, twosomes, threesomes, foursomes, etc.' (N.B. Each syllable in a four-syllable word is a foursome; perhaps quadruplet would be a better translation.) According to their order in a word they may be called first, second, etc. or last (ultimae), last but one (penultimae), last but two (antepenultimae), etc., or outer and inner syllables.

Junction is that which makes the syllables in a word into a whole word. Looseness is what prevents them from being combined into a word.

The means (medium or instrumentum) by which junction is effected may be looked upon either as a boundary of sound or silence, which has no extension, and is therefore no part of the syllables joined together, or as a part of the word and of the syllables joined together, which has a certain length and is common to both these syllables.

Montanus prefers the latter interpretation.

(p. 127) Junction is caused by transition from one syllable to another, which implies transition from one degree of height to another.

Syllables may be seamed or welded together<sup>8)</sup>. In the former case there is continuous breathing and sound-formation. The letters which make an attempt at sounding or rustling may for the purpose of Montanus' definition be taken as sounds.

The two syllables in kaersen and werpen are seamed together and the seams are s and p, respectively. They are the letters which are produced during the transition from one syllable to the next and they belong to both.

If we were to pronounce kaers-en and werp-en, part of s and p would be removed from the second syllable. On the other hand, in pronouncing kaer-sen and wer-pen part of s and p is taken away from the first syllable and added to the next.

The mark for seaming is , under the seam, e.g. kaerşen, or ^ over it, as in werpen.

Inl. p. 28: \* or r is used by the French to indicate that the letter above or below which it is placed is silent.

I use it to indicate seaming, because the printers have not got the type that I had intended for this purpose.

[ The only work in which I have found this mark used to indicate silent letters is Le Grand Dictionnaire François - Flamen - Item un abregé des lettres qui ne se prononçent point, A Rotterdam, chez Isaac Waesbergve (= Waesberghe), 1640.

It seems to have been first published in 1618.

The following illustrations may suffice:

eşť, diťť, porteť, synopleť, ĥommeť, ceťte, tempťs, piedť, eşťreť.]

The seams may be divided into a great many species according to the letters of which they consist, but the most important are those which receive their specific difference from the different heights of the seamed syllables.

There is rising seaming in bòelээр, falling in blaéзèn, level in the last two syllables of wandèlèn.

Welding is a kind of junction in which there is a slight pause between the syllables. It occurs, for instance, in the noun 'viersteen' (= flint, a compound of 'vier' (= fire) and 'steen' (= stone)), where there is a short rest between 'vier' and 'steen', during which breathing stops and no sound is formed <sup>9</sup>).

In the chapter on change in words (M. p. 139) he points out that a word like maelen ([ma.lə(n)]), in which the l is a seam belonging to both syllables, is usually divided into mae- and -len with a weld before the l, but also frequently divided into mael- and -en. A third way of dividing the word can be effected by lengthening what was originally the seam, and adding one l to each syllable: mael - len.

On the other hand, a weld may be changed into a seam, as in locçaes, winçdas, melçemmer, huiçraet for lock-aes, wind-as, melk-emmer, huis-raet, in all of which the last letter in the syllable preceding the weld is made into a seam belonging to both syllables, or as in koeçtal, tweeçprong, drieçling, ballçast for koe-stal, twee-sprong, drie-ling, bal-last, in which the first letter of the syllable following the weld becomes a seam belonging to both syllables.

In the Appendix (p. 164) he adds that in the locçaes-type of junction the seam changes its 'breadth' if the following conditions are fulfilled:

1. it must be a mute
2. it must be of the type that changes its breadth when followed by an inflectional ending beginning with a vowel (e.g. gront/

gronden, goet/goede)

3. it must be followed by a letter of a higher degree.

Thus:           gront-ijs        > grondijs  
                   goet-aerdich > goedærdich  
                   gront-letter > grondletter  
                   gront-woort > grondwoord

Similarly [x] > [ɣ], and [f] > [v] in zuiglam, zuigmamme, lijveige.

In the koeſtal-type of junction the seam only changes, if it is a free broad rustler preceded by a narrow mute, in which case it becomes narrow.

Thus: erf-goet > erfchoet, uit-geef > uitcheef.

Similarly viſſop, grontſop, heerikſaet, viſfat, zoutfat (apparently Present Dutch [sop] was pronounced [zop] by Montanus, cf. Flemish zoppe.)

If a broad mute precedes, the rustler remains broad, as in ribzacken, but this is rare.

If the seam is a broad choker or narrow mute, it remains unchanged, but mutes of different breadth preceding it assume the breadth of the seam. Thus: recht-banc > regdbanc, kaetsbaen > kaedzbaen.

Similarly kievidzbloem, handboom, hondzdraf.

[ Note that the fricatives are here again included among the mutes, cf. App. pp. 162 f, and that Montanus only deals with (progressive and regressive) assimilation of voice and voicelessness <sup>10)</sup>.

Montanus was by no means the first to notice assimilation. Dionysius of Halicarnassus (ed. Roberts, p. 222) warns against the change of word-final  $\nu$  to  $\mu$  before word-initial  $\pi$ , the Romans (e.g. Quintilian, Velius Longus, Terentius Scaurus) know that  $b$  in the groups  $bt$  and  $bs$  is pronounced [p]. The sixteenth-century French writers (e.g. Péletier, Saint-Liens, H. Estienne) mention 'neuf' pronounced with [v] before a word beginning with a vowel. De Bèze (Beza), in Péletier's *Dialogvø*, points out that 'second' and 'secret' have [g], not [k].

John Hart lists several assimilations in English, some of which are rather surprising (see Dobson I, pp. 76 f).]

(Inl. p. 27) Junction of syllables in a word, whether welding or seaming, is indicated in writing by placing the symbols close together.

(p. 128) Looseness of syllables may be original (or natural), which occurs in monosyllabic words, or it may be derivative (or artificial), which arises from loosening or disjoining syllables which were originally joined together, e.g. zoomer, divided into zoom-er, zoo-mer, or zoom-mer.

The chapter ends with a table in which he proposes a set of technical terms to indicate whether a syllable is seamed or welded at both ends, seamed at one end and welded at the other, or vice versa.

(Chap. VIII, p. 128) Division of syllables as matter of the parts of words.

Like letters and syllables, words can be divided into grounds and cleavers.

The ground of a word is the upper-word-member of the word, the cleavers being all the other syllables, which, of course, may be divided into onesome, twosome, etc. front- and back-cleavers.

Latin words do not run to more than two back-cleavers (e.g. Dóminus), Dutch words may have as many as four (e.g. léugen-achtige, óoverichheeden).

(Chap. IX)

A double (= complex or multiple) syllable is one which consists of more than one syllable.

A disyllabic uncompounded word is said to contain a double syllable (proper) i.e. two syllables, e.g. werken, aerde,

Trisyllabic words like heemelen, werkende consist of a triple syllable, and so on.

In the Appendix (p. 163) Montanus tells us that syllables are usually of the same degree of hollowness throughout, i.e. they are either flat, moderately hollow, or hollow, but the people of Zeeland have a few syllables which begin moderately hollow and end flat, e.g. hóat, góa.

(App. pp. 163 ff) Syllables are said to be narrow throughout, if all their letters are narrow; they are broad, if their letters are broad. However, syllables may have narrow front-cleavers and broad back-cleavers, or vice versa.

Note that the examples of words with narrow back-cleavers include bont [bont], and baert [ba·rt].

The general rule is that all the letters in a front-cleaver, back-cleaver, or <sup>seamed</sup>medial cleaver are of the same 'breadth', if one of them is a mute.<sup>11)</sup>

Notes to Chapter XII

- 1) Cf. Scripture, *The Elements of Experimental Phonetics*, p. 450.
- 2) De Heuter, 1581, p. 36, gives 'schrijft' as an example of an eight-letter syllable.
- 3) Dionysius of Halicarnassus, *De comp. verb.*, Chap. xv, ed. Roberts, p. 152, recognizes degrees of length in short as well as in long syllables by considering syllable-initial consonants (whose length, however, is ignored for metrical purposes) as well as final consonants and vowel-quantity.
- 4) Cf. Sievers, *Grundzüge*, 5th ed., p. 263.
- 5) Wigardus a Winschooten, 1683, notices that his contemporaries write vr- for earlier wr- (De Vooy's, *Verzamelde Taalkundige Opstellen I*, pp. 345 ff).
- 6) Cópèrdraèn, corrected to coópèrdraen on page 30 Inl. Côopèrdraèn is probably what was intended.
- 7) He seems to have missed Meigret on the subject (Tretté, 1550; cf. Livet, p. 104: il imagine des mots de douze syllabes comme Constantineopolitanisation, ils constantineopolitanizeront).
- 8) Cp. 'close and open juncture' in modern American writers.
- 9) Note that his letter-welds (M.p.92; see above, Chap. XI) do not involve pause.  
Cf. Robinson, according to whom sounds in a syllable follow each other 'without any intermission', while between the

syllables in a word there is 'a very small intermission'  
(ed. Dobson, p. 13).

10) On assimilation in Pres.Dutch, see Kruisinga, 1924,  
pp. 11 ff; Zwaardemaker and Eijkman, 1928, pp. 222 ff;  
Eijkman, 1937, pp. 118 ff; Blancquaert, 1953, pp. 154 ff;  
Cohen, Ebeling, Eringa, Fokkema, Van Holk, 1959, pp. 46 ff;  
Van den Berg, 1960, pp. 54 ff.

11) The word 'mute' should probably be taken in the sense  
of choker, i.e. stop (cf. M. pp. 162 f).

CHAPTER XIIIWords, Sentence Slices, and Sentence Members.

(Bk. IV, p. 130, The Word)

The third species of speech is the word.

A word is a speech which contains an upper word member.

'Word' as used by Montanus in this book must be taken in the sense of 'speech-word' (see above, Chapter III, p. 67).

Single words<sup>1)</sup> contain only one upper word member. They can be divided into a principal half and a less principal half. The principal half consists of the upper word member and the lower word members following it. The less principal half consists of the lower word members preceding the upper word member.

The third parts of words are grounds, front-cleavers, and back-cleavers (see above, M. p. 128).

(p. 131) In every word there is a ground, but a word can exist without any cleavers.

According to their remote matter (i.e. letters) words may be divided into those of one, two, three etc. letters.

Examples of one-letter words are Latin a, e, Engl. a, etc. and the names of the free snap-sounders, when pronounced short.

According to their proximate matter words are monosyllabic, disyllabic, etc. There are more than 2700 monosyllabic words in Dutch, each of which can undergo various changes and remain monosyllabic<sup>2)</sup>.

(p. 132) There are many disyllabic words in Dutch, original (primitive) as well as compound and derivative, more than three hundred of the original words ending in -el, more than two hundred in -er, and a considerable number ending in -e or -en. Some end in -em and -ij. There are few others.

Dutch has few original trisyllabic words, as compared with Latin (e.g. Dominus) and other languages, but a great many derivatives and compounds.

Words may also be distinguished according to the degrees (of height) of their proximate matter, e.g. into acute and circumflex upper member words.

According to their third parts words may be divided into naked or bare (consisting of a ground only) and clothed. The clothed words are half- or fully clothed. The half-clothed words have front- or back-clothing.

(Chap. III)

The properties of words considered in themselves are quantity, height, and change.

Quantity depends on the amount of matter, i.e. the number of letters and syllables. Words may be divided roughly into long and short, more accurately into those of one time, two times, etc.

(p. 133) As regards height, words may be 'peaked', rising, falling, or rising-falling.

A peaked word consists of a single (or naked) syllable, which can only have the upper-word-member degree of height [Montanus

should have added: 'when pronounced in isolation'.]

Rising words are those in which the upper word member comes last, falling ones open with the upper word member, falling-rising words have the upper word member in the middle.

The last three are identical with the front-, back-, and fully clothed words, respectively, but are here considered from a different point of view.

According to the distribution of the degrees and species of height over their principal half, words may be divided into

1. those which end in, or consist solely of, an acute upper word member (Gk. Oxytona);
2. those which end in, or consist exclusively of, a circumflex upper word member (Gk. Perispomena);
3. those which have one or more lower word members following the upper word member (Gk. Barytona), which can be subdivided into

(p. 134)

- a. those which have one lower word member following an acute upper word member (Gk. Paroxytona);
- b. those which have one lower word member following a circumflex upper word member (Gk. Properispomena);
- c. those which have two lower word members following the upper word member, which is then considered to be always acute by the Greeks and Romans (Gk. Proparoxytona).

Neither Greek nor Latin can have more than two lower word members following the upper word member, but Dutch can (cf. M. p. 118).

For all these categories Montanus provides new Dutch terms.

(p. 134) Chapter IV deals with the various types of change in words. The categories with which he operates here are identical with or analogous to the ones set up for dealing with syllable-change (see M. pp. 118 ff).

As words have letters for their remote matter, and syllables for their proximate matter, the addition or removal of either letters or syllables will bring about a word-change.

A reduction in the number of syllables (cf. Synæresis, M. p. 118) in a word is illustrated by contracted forms, while Svarabhakti provides an example of an increase in the number of syllables (cf. diæresis, M. p. 118). In another example of the latter a contracted form is incongruously taken as the starting-point of the change.

A great deal of attention is paid to word-mixture (Compositio) by which two or more single words are changed into one.

(p. 135) The resulting compound word should be looked upon as a single word, because it has one form, i.e. it contains only one upper word member <sup>3)</sup>, and as a thing should derive its name from its form, a compound is a single word in spite of its matter being complex (see above, 1.6, p.34).

The ability of words to combine with one another to form compounds is a considerable asset to a language, as by it the vocabulary can be considerably enriched, since two-word compounds can be made into three- and even four-word compounds. Moreover, it is possible to convey as much meaning in one compound as in a long descriptive phrase.

One of the most important uses of compounds is as denotative

matter of newly discovered things. The invention of entirely new words for this purpose, although feasible, would lead to obscurity. A language incapable of composition has to resort to long sentences instead of single (i.e. compound) words and must be considered poor and deficient. Latin is such a language, since it only allows of composition with the help of prepositions (= prefixes). The same applies to French and other languages. Greek, as it is more fortunate in this respect, should be praised above the others, but German and its dialects, especially Low German (i.e. Dutch) is admirably (p.136) capable of composition in all kinds of words, and in it groups of three and more words may be combined into one. Therefore, it is the clearest, most convenient, and most excellent of all languages in the world, in which all arts and sciences, even the most difficult, most profound, and most recently discovered, can be described more accurately and clearly than in any other <sup>4)</sup>. This is proved by Stevin's 'Mathematical Memoirs of Prince Maurice' <sup>5)</sup>, and, to a certain extent, by the present treatise.

(p. 136) Compounds can be distinguished according to the number of words of which they consist, but also according to whether the upper-word-member degree occurs in the first or second, etc. component, and according to whether the components are seamed or welded together.

Decomposition of compounds, or even of uncompounded words, is analogous to diæresis in syllables (cf. M. p. 118).

't sal for het zal, z'is for zij is show 'syllable mixture' as well as 'word mixture' (cf. 'twelc, M. p. 123). The opposite change is illustrated by decomposition of z'is into zij is.

The upper-word-member degree of height may be shifted from one syllable of a word to another (shifting of accent).

(p. 137) to a number of Dutch illustrations of this phenomenon, in some of which the shifting may be due to rhythmical causes, though Montanus does not say so, he adds rógas, rogás ?.

(For shifting of the upper-letter degree from one letter to another in the same syllable Montanus refers back to his examples in the chapter on syllable-change, M. p. 119, which are all unconvincing (joffrou > ieffrou, iemant > jeemant, ijgeijc > jeegelijc, Fr. a Djeu > Dutch adieu, where i has the upper-letter degree in the first word of each pair, while the vowel following i has it in the second), and cannot even be interpreted as illustrating 'Akzentumsprung' in diphthongs (cf. Verschuur, p. 175).)

An example of prosthesis is n̄oom for oom (cp. Engl. uncle/nuncle), one of paragoge (also called proscematismus, or prospiralipsis) is mensch for mens (cf. the syllable, M. p. 119) (the addition of derivational suffixes also comes under this heading), one of epenthesis is naementlijc for naemelijc.

Lengthening of a cleaver (diplasiasmus), as in aessem for aesem, alssem for alsem, geessel for geesel, twijffel for twijfel, is one kind of epenthesis, while another kind (paremptosis) is the insertion of a different cleaver, as in pampier for papier.

(p. 138) The above examples of diplasiasmus all show lengthening of the seam between two syllables.

A weld between two syllables may also be lengthened. This may happen in reading a word which is divided at the end of a printed line.

Latin anser compared with Dutch gans shows apharesis, French ver for wurm suffers from apocope, High German Welt for werlt has syncope.

(p. 139) Rearrangement of the syllables of a word is seen in putwaeter/waeterput.

Commütation of letters or syllables in words (antithesis, antistoechön, or metalepsis) is illustrated by Latin factum, doctum; It. fatto, dotto and a number of other examples, including comparatives and superlatives (p. 140) contrasted with their positives.

(p. 141)(Chap. V)

The properties of words in sentence slices are height, number, order, and junction.

The word which surpasses the other words in a sentence slice in height is said to be the upper word, because it sounds in the upper-word degree. Inl. p. 26: the mark for the upper-word degree is '. A word which by itself constitutes a sentence slice naturally has the upper-word degree.

The other words in the slice are of the lower-word degree. Thus in the two slices lieve vrient, hoe gaetet al ? (Dear friend, how are you ?) lieve and gaetet are upper words.

[ In most of the examples containing a group consisting of an adjective and a noun the adjective is the upper word. ]

On page 27 of the Introduction Montanus explains that in 'Bemínt malkànderen ván hértén' (Love one another with all your hearts), the mark ' over the second a of malkànderen indicates that malkànderen sounds in the upper-word degree, and that the sound rises in Bemínt malkà, is highest in à, and falls in ànderen ván hértén. In other words, it rises in í à, is highest in à, and falls in à á é.

As regards number, there may be one, two, three, four, etc. words in a sentence slice.

In 'Goetheit / en waerheit / zijn de weegen / van dien grooten God'  
(Goodness / and truth / are the ways / of that great God)  
there are four slices, containing one, two, three, and four words, respectively.

(p. 142) The words in a sentence slice may be divided into first, second, etc.; last, last but one; outer words and inner words.

Junction between words in a slice is caused by the transition from one word to another, which implies transition from one word-degree to another.

Words may be seamed or welded together.

The means by which seaming of words is effected is a letter (the seam) which is produced during the transition from one word to the next and which is common to both.

Word-seaming is very common in French, e.g. mézámis, nózennemis, vóuzavéz, lézunións, Ióbaymóit for mes amis, nos ennemis, vous avez, les unions, Iob aymoít.

In our language it is not used, unless one were to count as two words gaet wech (from wechgaen), loop an (from anloopen), which are often seamed: gaed<sup>+</sup>wech, loop<sup>+</sup>an.

In word-welding there is a rest between the words, during which no breathing or speaking takes place. The two words in each of the following three slices have welds between them:

Daer is / niet zwaerder / dan Gout.

(There is / nothing heavier / than Gold.)

Inl. p. 27: Junction of words in a slice, whether welding or seaming, is indicated in writing by leaving a narrow space between the words. (For special purposes seaming may, of course, be indicated by , or ^.)

As matter of the third parts of sentence slices words are either ground-words or front- or back-cleavers.

There can be only one ground-word in a single slice.

In 'het wait' het is a front-cleaver, wait is the ground-word.

In 'álle Cruiden leeven' (All herbs live), álle is the ground and the last two words are the back-cleaver..

In 'De Ménschen zijn bedriechelijc' (People are deceitful) the last two words are the backcleaver.

[ The unusual distribution of 'height' over the last two 'slices' might have been rendered plausible by a context, which, however, is not provided. ]

(p. 144, Bk. V. Sentence slices)

Chap. I.

A sentence slice is a speech containing an upper word.

The principal half of a sentence slice consists of the upper word and the lower words which precede it. The less

principal half of a sentence slice consists of the lower words following the upper word.

In 'De bléike doot / klopt éeve stijf / aende Póorten der Rijken / en aen de Crótjes der Armen.' (lit. Pale Death / knocks as relentlessly / at the gates of the rich / as at the hovels of the poor.) [ Horace, Odes I, 4: Pallida mors æquo pulsat pede pauperum tabernas, Rægumque turres. ]

De bléike, klopt (= clopt) éeve, aende Póorten, en aende Crótjes are the principal halves of the four successive slices (p. 145) and bléike, éeve, Póorten, and Crótjes are the ground-words, while De, clopt, aende, en aen de are front-cleavers, and doot, stijf, der Rijken, der Armen are back-cleavers.

Chap. II.

A sentence slice may consist of as many as eleven syllables, as the sixth slice in the following example:

Job / die zeer rijk was / in Ossen / keemelen / schaepen / en in veelderlei andere goederen; is van al de zelve / door Gods toelaeting / haest ontbloot.

A literal translation in which the original word order has been retained as far as possible might run:

Job / who was very rich / in oxen / camels / sheep / and in many other kinds of goods; was of all these / with God's consent / suddenly deprived.

Sturmius and Alstedius say that there cannot be more than eight syllables in a sentence slice, Keckermannus says nine, but the above example proves that they are wrong. Moreover,

since there are words of eight syllables (cf. *irreprehensibilit e*, M. pp. 129, 132) to which others may be added in a slice, there must necessarily be slices of more than eight syllables.

[ Ioannes Sturmius, *De Periodis*, Argentorati, 1550, pp. 9 ff: An incisum or comma may have 8 or 9 syllables.

Alsted, *Encyclopaedia*, p. 383: Comma se continebit intra septimam vel octavam syllabam: colon potest excedere numerum octodecim syllabarum. On page 365, where he discusses the comma as a punctuation mark, he says: Comma novem vel octo syllabas non facile excedet.

Keckermann, *Opera Omnia II*, Genev e, 1614, Col. 1524:

Magnitudo commatis diuersa est, pro diuersitate verborum, regulariter tamen est summa eius magnitudo syllabarum octo vel novem.]

According to their proximate matter, slices may be divided into those of one, two, three, etc. words.

(p. 146)) The following sentence slices consist of a ground only, and may be called naked: hoort / ziet / zwijcht. Veni, vidi, vici.

Like letters, syllables, and words, sentence slices can be clothed in front or at the back, or be fully clothed.

(Chap. III)

The properties of the sentence slices considered in themselves are quantity, height, and change.

The quantity of sentence slices depends on the amount of their matter, i.e. the number of letters, syllables, or words.

They may be divided roughly into long and short, and more accurately into those of one time, two times, and so on.

As regards height they may be 'peaked', rising, falling, or rising-falling.

In addition to the changes in the matter of the sentence slices discussed in the sections on change in syllables and words (M. pp. 118 ff, 134 ff), there may be changes in form which do not affect the matter.

(p. 147) The two slices in 'Alle Ménschen / zijn verdúrven' (All mén / are depráved) can be reduced to the one slice: 'Alle Menschen zijn verdúrven', in which case there is a reduction <sup>6)</sup> of the forms from two to one, although the matter remains constant. By reversing the process one form is split into two, the matter remaining unaltered.

[ Note the suppression of the first accent in the single slice in this and the other examples.]

In 'néegen / en twíntich /' (níne / and twénty /) there are three words and two slices. In 'neegenentwíntich' (one word, one slice) there is reduction in the number of words as well as in the number of slices, although no change has taken place in the matter.

A change in the shape of the form, i.e. in the distribution of height over the sentence slices, is illustrated by 'De wíjn is góet' (The wine is góod) by the side of 'De wíjn is goet', were there is shifting of the upper-word-member degree from the matter of one word to that of another, as a result of

which a rising-falling slice is changed into a rising one. (p. 148) Changes in the matter of a sentence slice can be brought about by adding words to it, by omitting words from it, by changing the word order, or by replacing a word by another.

A complete change is brought about in a sentence slice by bringing it about or destroying it.

(Chap. IV)

The properties of sentence slices as the matter of sentence members are height, number, order, and junction.

The sentence slices which together make up a sentence member are not all of the same degree of height, there being a noticeable difference in the height of their upper words. This can be heard in the following sentence member, which consists of two sentence slices:

'De ménschen / die in de eerste werlt lēevden:' etc. (lit. The péople / who in the first world lived: etc.),

where the first slice, and more particularly its upper word, sounds lower than the second slice and its upper word. This can be tested by pronouncing mén- and lēev- in succession at the height which they had in the sentence member.

In the above example the second slice is in the upper-slice degree, the first in the lower-slice degree.

[´ indicates the acute upper-word-member degree, ˙ the upper-slice degree, see Inl., p. 26.]

In 'Den Coning Sálomon / die wíjs / en zeer voorzichtig was: etc.  
 (lit. King Sólomon / who wíse / and very prudent was: etc.)  
 the third slice has the upper-slice degree (and may be called  
 the upper slice or ground-slice, p. 150).

(p. 150) There may be one, two, etc., slices in a sentence-  
 member, which may be referred to separately as first, second,  
 etc.; last, last but one, etc.; outer and inner, slices.

Junction of sentence slices is always of the welded type, i.e.  
 there is always a pause between successive slices. The slice-  
 weld is longer than the word-weld, and it occurs between two  
 word degrees, whereas the word-weld has its essence between  
 two word-member degrees.

(Inl., p. 27) Junction of slices in a sentence member is indicated  
 in writing by placing (/) or (,) between them, and leaving a  
 space on both sides.

(p. 152) Book VI, Sentence Members.

The 5th species of speech is the sentence member.

A sentence member is a speech which contains an upper sentence  
 slice.

(p. 153) The upper slice in a sentence member constitutes its  
 ground, the lower slices are its cleavers.

The principal half precedes the less principal half.

[ Note that in the syllable and the word it is the less  
 principal half that precedes, whereas in the sentence slice  
 and the sentence member it is the principal half.]

Quantity of a sentence member is a property arising from its  
 matter. Sentence members may be long or short.

Height is a property arising from the form. Sentence members may be peaked, rising, falling, or rising-falling.

(p. 154) From a different point of view they may be said to be naked, clothed in front or at the back, or fully clothed.

(p. 155) Like the sentence slices the sentence members may be reduced or increased in form without their matter being affected.

In his first example on page 155, however, the reduction of two members to one is accompanied by a slight change in the matter. In order to be able to suppress the conjunction linking the two sentence members in their original (double) form, Montanus surreptitiously turns the first into a participial construction.

Another change in form, but not in matter, is brought about by shifting the main accent or upper-slice degree from one slice in a member to another.

The sentence (member) in the example on page 155 consists of three slices, each of which is in turn made the upper slice by having the 'height' of its 'highest' syllable raised above that of the 'highest' in the other slices.

Material changes can be brought about in sentence members by pronouncing them slowly or rapidly, coarsely or finely, and by hardening or softening them, i.e. pronouncing them loudly or gently.

Sentence slices can be added to or removed from sentence members without an increase or decrease in the number of the sentence members being thereby effected.

(p. 156) The order of the slices in a sentence member may be changed, or one slice may be replaced by another.

Chap. IV.

The properties of the sentence members in sentences are number, order, height, and junction.

(p. 157) Junction of sentence members is always of the welded type.

Inl. p. 27) Junction of sentence members in a sentence is indicated in writing by (:) and a space on both sides of this mark. Junction of sentence members which are part of another may be indicated by (;), junction of those which are not by (:).

Examples of (:) between sentence members occur on pp. 150, 155, and 157. There are two examples of incomplete sentences on page 149 with (:) at the end of sentence members.

What Montanus means by sentence members which are part of another is not clear.

There is an example of (;) on page 145, where it occurs between two sentence slices. Note that the others are followed by (/).

On page 150 (;) occurs between two separate sentence members. That they are separate is expressly stated by Montanus.

(i), which on page 26 Inl. is defined as a mark indicating the upper-sentence-member degree, occurs on page 153 as a junction-mark. It is difficult to decide whether this is a misprint for (:) or for (;).

[Montanus' division (or rather, partition) of the sentence into members and slices is an improvement on the classical division of the περίοδος into κῶλα and κόμματα, which were never satisfactorily defined. The περίοδος could consist of from one to four κῶλα, the κῶλον usually contained two κόμματα. The κόμμα consisted of one, two or three words. The κῶλον was sometimes defined as a 'breath-group'. (See Demetrius, Περὶ ἑρμηνείας, ed. W. Rhys Roberts, pp. 294, 302, 308, 320; Quintilian, Inst. Or., ix, iv, pp. 122 ff; Steinthal I, p. 271, II, p. 353; OED s.v. Colon and Comma.)

Even if we cannot be sure whether Montanus was thinking in terms of stress or pitch or both, we shall probably be justified in interpreting his 'sentence slice' as 'the stress-group' of the nineteenth-century phoneticians or Stetson's 'foot', and his 'sentence member' as the 'breath-group' of the ancients and the moderns.

(On stress-groups and breath-groups, see, e.g. R.J. Lloyd, Northern English, pp. 28 ff; D. Jones, An Outline of English Phonetics, 8th ed., p. 274; R.H. Stetson, Motor Phonetics, 2nd ed., pp. 3 f; W. Viëtor, Elemente, 4th ed., p. 265; O. Jespersen, Lehrbuch, 3rd ed., p. 207; E. Sievers, Grundzüge, 5th ed., pp. 232 ff.

The resemblances between Montanus' Books V and VI and Sievers' Cap. 32 are particularly striking.)

His delimitation of the 'slices' in Book V is, on the whole, acceptable both as regards stress and syntax, but his choice of adjectives and adverbs rather than nouns and verbs for

his 'upper words' is surprising (see the quotation from Horace on p. 144, where, moreover, the two genitives in post-position are treated as 'lower words').

In his quarrel with Sturmius, Alstedius and Keckermannus over the maximum number of syllables in a slice he forgets that their figures bear on Greek and Latin commata, not on Dutch 'slices'.

It is remarkable that he never refers to the changes in meaning brought about by his material and formal changes. Some of his sentence members in Book VI are complete sentences.

In the first example on page 153, 'Den Apostel Paulus zeit / dat de besolding der zonden / de doot zij' (The Apostle Paul says / that the wages of sin / is death), one would have expected the last slice rather than the middle one to be the 'upper slice'. The example on pp. 153 f contains a sentence member which consists of one slice, but at the same time constitutes a complete sentence.

The distribution of 'height' over the sentence members on page 155 and page 157 strikes one as rather arbitrary.

The first really satisfactory description of pitch variation (and rhythm, a subject on which Montanus does not touch at all) in speech is found in Joshua Steele's *Prosodia Rationalis*, 1775 and 1779.

Before his time little more was known than what Aristoxenus of Tarentum and Dionysius of Halicarnassus had said about the musical intervals implied by the Greek accents (see Sturtevant, pp. 96 ff).

Reuchlin used musical notation in Book III of 'De accentibus', and Meigret tried to reduce 'les accens ou tons des syllabes et diccions' to a set of extremely rigid rules in 'La Tretté de la Gramme Françoeeze', 1550, pp. 179 - 190 (see esp. his rules for the distribution of 'accent' over groups of monosyllables).

Other early attempts to devise notation-systems for intonation include those made by Gluck's librettist Calzabigi, John Walker (Elements of Elocution, 1781), Hänle, 1814, Louis Köhler, 1853, Merkel, 1866, and the nineteenth-century Russian composer Dargomyjsky. (See also the remarks on pitch variation and its causes in Robinson, Wallis, Holder, and Cooper.)

Montanus shows himself a less accurate observer of junction than some of his predecessors.

Aristotle and Dionysius of Halicarnassus knew that normally there are no pauses between the successive words of a sentence and that we pronounce sentences rather than words (cf. K.E.A. Schmidt, p. 159, W. Rhys Roberts' ed. of Dionysius of Halicarnassus' De Compositione Verborum, p. 206). Saint-Liens, 1580, and De Bèze, 1584, make remarks to the effect that the words in a sentence follow each other so closely that the sentence may be looked upon as one long word.]

At the end of Book VI Montanus tells us that the section dealing with the sentence is not yet ready for publication, because he has developed many new ideas on this subject, 'of which the grounds have not been laid in the preceding description'.

Book VI is followed by a six-page appendix (pp. 159 - 164) in which Montanus revises a number of chapters of Books I, II and III.

These revisions have been dealt with in the appropriate places in the present account of Montanus' 'Art of Speech'.

The Appendix ends with Montanus' promise to publish many more discoveries relating not only to this art of speech and other 'elementary school-arts', but also to some 'higher sciences'.

Notes to Chapter XIII

1) On p. 142 Montanus decides not to discuss the 'double words'. They would probably have been groups of two or more words, and essentially identical with the sentence slices (cf. his 'double syllables' at the end of Chapter XII, above). Compounds are 'single words' from Montanus' point of view.

2) Stevin in 'Beghinselen der Weeghconst', 1586, observes that there are 742 monosyllabic verbs and at least 1428 other monosyllables in Dutch (see L. van den Branden, *Het streven naar verheerlijking, zuivering en opbouw van het Nederlands in de 16e eeuw*, Gent, 1956, pp. 194 f).

3) Apollonius Dyscolus, followed by Priscian, bases his treatment of compounds as simple words on semantic as well as phonetic (accent and junction) criteria (see Steinthal II, pp. 261 f).

4) Similar sentiments are expressed by De Heuiter, 1581, p. 29, and Spieghel, Twespraack, 1584, p. 92. Cf. Cooper, 1685 (ed. Jones, p. 148, *De Compositis*), on the fertility of English in this respect.

5) Leyden, 1608.

6) 'Vermeerdering' (increase) must be an error for 'vermindering' (reduction).

7) This is the only allusion to voice quality occurring in 'The Art of Speech' (cf. Quintilian, *Inst. Or.* XI, iii, 14 ff and 32).

### CONCLUSION

It is hoped that this simplified version of 'The Art of Speech' has given the reader who has had the patience to peruse it some idea of the nature of this remarkable book. It may be as well at this point to remind him that what he has seen of 'The Art of Speech' in the present treatise is a simplified account, since most of the neologisms which in the original descend on the reader's brain like so many strokes of a bludgeon have been suppressed. In the field of word-creation alone Montanus' achievement could hardly be paralleled.

What is even more astonishing, however, is that with the sole aid of his powers of observation and a system of logic, now largely outdated, one man should have been able to make so many contributions to the knowledge of a difficult subject.

It is, of course, easy for us to see where he went astray. We may deplore his frequent appeals to 'reason' and the extent to which he used the syllogism to reinforce his observations, sometimes allowing it to interfere with them, and his child-like delight in calculating the number of possible 'genera and species' of vowels and consonants, incongruously coupled with the belief, shared by many later generations, that by drawing up a list of the sounds of his own language with a few foreign sounds thrown in to fill 'the empty places' he had set up a 'pronunciation and alphabet of all languages'.

We can hardly blame him, however, for taking the 'letter' or 'speech sound' for granted without attempting to justify segmentation, or for working upward from sound to sentence instead of descending from the complete utterance to the

smallest unit, since few modern writers feel the necessity to do so. Whatever its faults, the descriptive system set up by Montanus is admirably coherent and carefully thought out and the inconsistencies in it are almost negligible.

In spite of his contempt for the work of his predecessors he appears to have been well acquainted with it, witness his treatment of the subordinate elements of diphthongs as consonants, his analysis of all types of units into 'principal and less principal halves', his remarks on the orthographical vices, the origin of the shape of F and the mark for spiritus asper, and a number of other topics.

The influence of tradition is most clearly discernible in his retention of the distinction between the acute and the circumflex accent for strong stress (and pitch change ?) on 'short' and 'long' vowels, respectively, and the sections dealing with 'metaplasms', which have been summarized in the present treatise solely for the purpose of giving a clear and unbiased picture of the merits and demerits of Montanus' book.

Apart from the distortion of some of the facts due to his desire for symmetry, Montanus' most notable failures are his belief that [g] is an unusual way of pronouncing the letter g and that there are pauses between words, his analysis of German sch- as a 'double consonant' and of Dutch [f] and [v] as labials, his ignoring of [ə] and his inconsistency over [j] and [w].

However, these are more than counterbalanced by his recognition of [h̃], [ʔ], [ŋ], and other sounds, his handling of the voice/

breath opposition, which, although incorrect, is extremely intelligent and interesting, touching as it does on the vexed lenis/fortis problem, his generous account of the organs of speech, his introduction of such nineteenth-century concepts as glides and sonority, his alphabetic notation, his elaborate rules for assimilation, his description of syllable structure, his criticism of the Graeco-Roman and Hebrew classifications, his treatment of junction and stress (and pitch?) phenomena, his anticipation of modern phonology, and a number of short references to other interesting topics, such as ingressive speech. (It is rather surprising that whisper is not mentioned in 'The Art of Speech'.)

Though some writers had dealt with some of these subjects before him, Montanus' views on most of them were far superior to theirs and he was certainly the first phonetician to realize the complexity of the subject and to discuss such a large number of problems in a single treatise.

It would be idle to speculate on the course that the study of phonetics might have taken, if Montanus had been read. The work done by the brilliant Royal Society group (Wallis, Lodwick, Wilkins and, above all, Holder) did not prevent most of their contemporaries and successors from producing a considerable amount of rubbish, and it is not likely that they would have availed themselves of the opportunity provided by 'The Art of Speech' of skipping two centuries.