A DISSERTATION ON SPEECH

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A DISSERTATION ON SPEECH

BY

JOHN CONRAD AMMAN, M.D.

with an introduction

by

R. W. RIEBER

Pace College, N.Y.C.

1965

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AMSTERDAM

DISSERTATIO
DE
LOQUELA

Qua non ſolum

Vox humana, & loquendi artificium
ex originibus ſuis eruuntur:

Sed & traduntur media, quibus ii,
qui ab incunabulis

SURDI & MUTI

fuerunt, loquelam adipiſci, quique difficulter
loquuntur, vitia ſua emendare poſſint.

AUCTORE

JO. CONRADO AMMAN, Med. Doct.

Plurima jam ſiunt, fieri quæ poſſe negabant.

AMSTELÆDAMI,

Apud JOANNEM WOLTERS,
CIↃ IↃ CC.

A

DISSERTATION ON SPEECH,

IN WHICH NOT ONLY

The Human Voice and the Art of Speaking

ARE TRACED FROM THEIR ORIGIN,

BUT THE MEANS ARE ALSO DESCRIBED BY WHICH

THOSE WHO HAVE BEEN

DEAF AND DUMB FROM THEIR BIRTH

MAY ACQUIRE SPEECH,

AND THOSE WHO SPEAK IMPERFECTLY MAY LEARN HOW TO CORRECT THEIR IMPEDIMENTS.

BY

JOHN CONRAD AMMAN, M.D.

Plurima jam fiunt, fieri quæ posse negabant.

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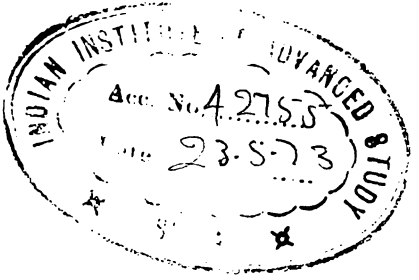
OPINIONUM COMMENTA DELET DIES:
NATURÆ JUDICIA CONFIRMAT.

Cicero de Nat. Deor.



INTRODUCTION

One may mark the beginning of a scientific period in the history of Logopedics with the publication of this book in 1700. Its importance in the area of phonetics and teaching of speech to the deaf is of course obvious. In this work Amman developed methods, formulated problems and theories, and established standards of analysis that have influenced many important scientists in the history of Logopedics.

The student who wants to understand the course of Logopedics during the past 300 years, and certain peculiarities of the profession today, should have some knowledge of this book and the circumstances in which it appeared.

John Conrad Amman enjoyed in his own day a reputation as Logopedist – Teacher of the Deaf – approached by few scholars in the history of speech pathology. His reputation has survived so that he continues to be thought of by many as the Father of his profession.

The details of Amman's life are not fully known. He was born in Schaffhausen, Switzerland, in 1669. He received his higher education in Basel, and graduated from the University of Basel as Doctor of Physic, in 1687(1). Soon after obtaining his degree at Basel Amman journeyed to Holland. Apparently it was in the Netherlands that Amman became interested in speech and hearing disorders. His first book in this field, *Surdus Loquens*, was published at Amsterdam in 1692. It is interesting to note that F. M. Van Helmont wrote of Amman in the preface of his book, entitled *The Spirit of Diseases, etc.* The date of Van Helmont's preface, interestingly enough, is the same date that is given in Amman's (2) preface to *Surdus Loquens* – August, 1692. Van Helmont (3) considered Amman among the

most ingenious men of his profession. The following quote from his book illustrates this point:

> . . . for in divers countries I have met with some very honest and ingenious men of the profession, who did not only confess, that there was nothing of Truth or Certainty in the common way of Practising Physick, but also exerted the utmost of their endeavours and left nothing unattempted whereby they might reduce this worthy profession into an art of certain and immutable truth. And these are the men who have frequently consulted me about these matters, and it is for their sakes that I have writ this treatise and not for those that follow the common road and method of physick whose censures I despise. And the less esteem I have for the vulgar method the more highly I value those that have found out anything that is real and praise-worthy in physick, amongst whom I cannot but make mention of John Conrad Amman Doctor of Physick who by his industry hath found out a way whereby such as are born deaf may with certainty scarce inferior to that of mathematical demonstration, learn to read readily and to take in the sense of others, not at their ears, but at their eyes, and to express their minds with an articulate voice; of which to pass by other instances, I my self have been an eye witness at Haarlem, in the daughter of Peter Koolard a famous merchant of that city, and with which I was the more pleased, because I found this useful invention of his to agree very much with what I delivered in my Alphabet of Nature. (3)

Van Helmont was one of the most famous mystic philosophers of his time, and it seems very likely that Amman was, to a certain extent, influenced by some of his ideas. (See page xxi of this book.)

There are several passages in Amman's dissertation that are quite extraordinary considering the period that they were written in. For instance, Amman had great sensitivity

to the psychological aspects of the therapeutic process. Amman puts the matter thusly: (pages 8 + 9 in this text).

> There is still a very different reason why men should desire to open the secrets of their hearts and the conceptions of their minds to others in *speech* rather than by *pictures*, *gestures*, or *characters*, and other things of this kind. Besides that certain signs, not uttered by the living voice, are liable to deceive, or are deficient in many important respects, every sincere mind, giving attention to itself when about to converse with another on a serious subject, feels a desire to declare the hidden thoughts of his heart, nay to pour his own life into him, and that he cannot effect these objects so completely as by the use of Speech; for nothing emanates from us which bears a more vivid character of life than our Voice; neither have I gone beyond the truth in affirming that the *breath of life* resides in the voice, transmitting its light through it; for the voice is the interpreter of our hearts and signifies its affections and desires.
>
> Hence, in these impetuous commotions of the soul which it is unable to repress, the mouth is forced to speak "out of the abundance of the heart". So also when we dwell upon something in our own minds which either from fear or shame we hesitate to utter, the heart travails, as it were, and is in a state of anxiety until we have poured it into the bosom of a friend, then the anxiety at once gives way to serenity, and it can truly be said that we have opened our hearts; for so the soul liberates itself, through the voice, of the burden which oppressed it, especially if unfeigned tears accompany it.

This remarkable passage was written long before Freud advocated free association and emotional catharsis.

At the time this book appeared, there were many theories of voice production. All of the theories of this period overlooked the phenomena of vocal cord vibration

as being the source of sound during phonation. In 1700, Dodart (4) stated that the glottis was the primary organ of the voice, and that tones depended upon the tension of the lips, etc. He also pointed out that the oral, nasal, and pharyngeal cavities simply modified the production of the voice. It is interesting to note that Amman, who was apparently unaware of Dodart's work, formulated a similar theory of voice production during that same period. (See pages 24–32 in this text.)

Although Dodart is usually given credit by most historians as the first one to suggest a myoelastic theory of voice production, Amman certainly deserves to be mentioned as well since both scientists independently arrived at similar conclusions during the very same year.

Amman was very cautious about labeling specific speech disorders as separate clinical entities. Although he does mention Hottentotism and Stammering as the two major non-organic defects of speech, he carefully points out that speech disorders, arising out of "bad habits" are present in so many different varieties that labels for them seem most inefficient, and that an adequate definition can only be given *via voce*. Although Amman does not identify the problem by name, he gives a most interesting description of a speech defect that would be identified today as cluttering. (See page 130 of this text.)

This English translation of Amman's dissertation was first published in 1873 under the editorship of Charles Baker, Headmaster of the Yorkshire Institution for the Deaf. The English edition is very rare. There now are only a few copies available throughout the world. A later reprint of a German translation and the original Latin text appeared in the periodical Vox 1917–18. Prior to the English edition, which was the last translation, a French

translation appeared in 1779 under the editorship of M. Beauvais de Préau. A German translation by G. Vensky appeared in 1747. Prior to this there were five Latin editions, the first in 1700, the last in 1740.

We would like to express our thanks to the North-Holland Publishing Company for making this reprint possible and hope that its availability will stimulate further interest in the study of the history of speech and hearing disorders.

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Pace College,
New York City
June 30th, 1965

R. W. Rieber

PREFACE TO THE ENGLISH TRANSLATION.

THIS Dissertation on Speech was written more than 170 years ago, in the infancy of the Art of instructing the deaf and dumb. During the fifty years previous attention had been called to the subject by several English authors, two of them also Teachers; and eighty years before its publication, a Treatise on the art had been published at Madrid, by Juan Pablo Bonet, who however was not the first instructor of those days, Pedro de Ponce, of Leon, having preceded him as a successful teacher a quarter of a century earlier: while the true theory of instruction had been expounded by the learned Jerome Cardan in Italy earlier still.

Amman knew of none of these efforts when he commenced his labours. He published his first book, "Surdus Loquens," in 1692. In 1700, while this Dissertation on Speech was in the press, he fell in with the mention of Bonet's work, and about the same time he received a letter from the celebrated Dr. John Wallis, who informed him that he had successfully carried out what Amman had made known in

"Surdus Loquens." Their correspondence is given in the Preface to his Dissertation.

"Surdus Loquens" was published in Latin at Amsterdam in 1692, at Haarlem, in Dutch, the same year. At Amsterdam again, in 1697 and 1702, at La Haye in 1717, and an English Translation by Daniel Foot, M.D., in 1694. His "Dissertatio de Loquela" was published at Amsterdam in 1700, 1702, and 1708, at Leyden in 1727 and 1740. It was translated into German by G. Vensky and published at Prenslau and Leipsig in 1747, into French, by Beauvais de Préau, M.D., Orleans, in 1779, and a new Translation into German by Dr. Grasshoff was published at Berlin in 1828.

The "Dissertatio de Loquela" is "Surdus Loquens" in a more extended and perfect form; at the time of its publication Amman had been a practical teacher of the deaf and dumb for ten years. The number of editions in Latin and in other languages is a sufficient indication of the esteem in which it was held. The influence it has had in Germany is manifest at the present day; and in France it was one of the "excellent guides" of the Abbé de l'Epée. A little surprise may naturally be felt that no Translation of it appeared in England, where attention had been drawn to the education of the deaf and dumb by the works of Bulwer, Wallis, Holder, and Dalgarno, more especially as the work was known, and is alluded to by Herries in his excellent "Treatise on the Elements of Speech," by Thelwall in his volume on "Impediments of Speech," and by others.

The methods of instruction pursued in nearly all the German Schools are to this time founded on the principles established by Amman, and their success must be attributed in a very high degree to the lessons of marvellous patience which this diligent worker taught and practised himself, and which seems to have descended to his German successors. In Spain, and England too, all the earlier efforts for the teaching of deaf-mutes were through the medium of Articulation, as we know from the writings of Wallis and Holder, and from the proceedings, which were never made public, of Henry Baker and Thomas Braidwood. The *true* principles however of intellectual training, as made known by Cardan, and further developed by Dalgarno, were not extensively carried into practice in the earlier days of the Art. There are some curious features in the history of the deaf and dumb; the means of imparting instruction to them were frequently lost and re-invented—gleams shone out at different times, in distant places, to be again and again intercepted and lost—it was pursued by many individuals without any knowledge of what others had accomplished—and many of the early teachers, even including some who lived at the beginning of the present century, thought it expedient to intimate that peculiar endowments were requisite for the practice of the art, to conceal the methods they employed, and thus invest their craft with secresy and mystery.

Amman had none of this fictitious artifice in his writings; he says, truly enough, "although

the method which I pursue has nothing miraculous about it, the patience necessary to the practice of it is all but miraculous." A little allowance for exaggeration must be made as to the results obtained by nearly all the earlier teachers, as we understand the language employed by themselves, and by others in narrating them, for we cannot but conclude from their accounts that a perfection must have been attained which is but seldom seen in the present day; perhaps these results were in some degree attributable to the efforts of the teacher being expended on a single pupil. Amman was a native of Schaffhausen, he was born in 1669. He was the son of a physician, and was educated for his father's profession; he took a high degree at the university of Basle in 1687, and soon after went to Holland and resided at Haarlem. In "Surdus Loquens," published in 1692, he says, "it is now three years since I first thought of making my methods public." If at that time he had been engaged in the work of teaching four years, he would have been very young when he undertook the education of Esther Kolard, his first pupil. In 1709 Amman published the Dialogues of Plato in the Dutch language. Amman died at Warmund, in the Netherlands, in 1724.

More than thirty years anterior to the date of Amman's Dissertation a very admirable "Discourse on Speech" had been written by Cordemoy; it was "Englished out of French" and published in London in 1668; from it Amman might have learnt much, but it was

evidently unknown to him. And although Cordemoy's Discourse was written without the slightest reference to, or knowledge of the deaf and dumb and their requirements, in it he established certain principles, which would have been of essential service to Amman; for instance, he describes how the Vowels, first, and then the Consonants, are formed by the organs of speech; and, in addition to all that he says as to the mechanism of the Voice and Speech, he arrives at certain deductions which a teacher of the deaf and dumb would at once appreciate—*e.g.*, "If there were some that had not the freedom of the Voice, he might by Characters expose to the eye the Signs of his thought," pp. 25,26. Again, "So that Speech is nothing else but a voice by which we signifie what we think. 'Tis true you may also joyn your thoughts to other signs besides the voice, as to the characters of Writing, or to certain Gestures, and that indeed all these ways of expressing ourselves are but ways of speaking," p. 77. He devotes several pages to show the natural and gradual process of acquiring a language, and that this natural course is to a great extent followed by Grammarians. Morhof, speaking of this work in his Polyhistor, says, "multa eleganter disseruntur," &c.

There are some curious notions in Amman's Dissertation. He entertained very extraordinary views as to the mystic powers of the human voice, and on the deterioration of the primeval language of mankind subsequently to, and in consequence of the Fall of Adam;

the superior claims which he attaches to articulation as a means towards the end will not be universally acknowledged by those now in the profession; at the same time, his analysis of the letters is as excellent and practical as any that could be written in the present day for the object in view.

The present Translation is as literal as it could be made to be readable; there are certain quaintnesses of expression, as well as of ideas, for which allowance will be made by all those into whose hands the book is likely to fall. The German translation by Dr. Grasshoff, in 1828, was produced for reasons irrespective of the general merits of the work—one of them being that the Prenslau and Leipsig translation of Vensky was exceedingly faulty, and another that it had become so very rare that a copy could scarcely be met with.

CHARLES BAKER,

Headmaster of the Yorkshire Institution for the Deaf and Dumb.

Doncaster, July 31*st*, 1873.

To the Most Honourable

and exalted

JOHN HUDDE,

XIX. Consul of Amsterdam,

This Dissertation on Speech is, with the best wishes for his prosperity, Dedicated by

THE AUTHOR.

About ten years have elapsed, most honourable Sir, since, for the sake of travelling, I left the Alps of Switzerland and landed on these shores, where the mildness of the climate, the number of literary men, and the charms of Society, but especially the ineffable sweetness of this incomparable city, in which you shine as a most brilliant star, so thoroughly overpowered me that I felt as if I had eaten of the lotus-tree, and could not, except against my will, return to my native home. However, I had not long resided here before I was induced to remove to Haarlem by the entreaty of a very great

friend to undertake the instruction of his daughter, who was deaf, and also dumb as a natural consequence of her deafness. My object I completely attained, and the result far surpassed both mine and her father's expectations, for in the short space of two months this most charming young lady could not only read with sufficient articulation, but could also commit to writing some words which were slowly pronounced; now she speaks upon any subject whatever without any awkwardness, and though deaf she hears others speak with her eyes, and promptly replies to their questions.

The method by which I taught her all this, I at last thought worthy of being made known for the benefit of others, and I published it under the title of "Surdus Loquens," in order that it might be further tested by the criticisms of more learned men. Since then, most honourable Sir, having been made a freeman of this city, I have for some years back given up myself to this Art, and to my medical practice, and with the blessing of God upon both I have not been uselessly employed. It has been my most earnest wish that foreign nations should be induced to attempt something of a similar kind, and be, as it were, led by the hand, and that, as far as I could help it, there should be no longer so many dumb persons in the world. That I have not failed in this respect is shown by the letters which I have received from England and Germany, in which energetic and hearty men testify to their success in following the steps which I had pointed out, and consult me upon points upon which I seemed to be too brief, or on account of the novelty of the subject, not sufficiently plain.

But in order to satisfy their reasonable wishes I resolved to publish this Dissertation on Speech, in

the place of that slight essay, and to dedicate it, with becoming reverence, to your most honourable name: fully confident that a work, undertaken solely for the benefit of the afflicted, would not be less acceptable to you (with whom the public happiness is the chief if not the only concern), the nearer it approached to that Spartan strictness, I mean the mathematical, which you have up to this time not so much cultivated as wonderfully adorned; for most of what I here teach has been tested with the rigour which geometry requires.

That I may briefly explain the purpose of my design to you, most noble Sir (for whom could I make a judge of my method better than a man of immense learning, and one thoroughly imbued with every branch of science, and whose name is venerated by all the literary world), I say, that after I have traced the office of the human voice and the whole art of speaking up to their origin, I freely and, as far as I can, clearly teach, not only the art by which they who have been deaf and dumb from the cradle may acquire the power of speech, and they who, whether by accident or disease, have lost their hearing and their speech may recover the latter, but also the method by which the defects of speech, be they what they may, provided the organs are not utterly unfit, can be cured: indeed I have met with such success, that the defects which I have deemed incurable no one has hitherto attempted to cure.

But I fear that while I study to be of service to some persons, I may transgress against the public benefit, if I take up with a long address the time of a Consul whose very leisure is consecrated to the public good. As a suppliant therefore I entreat the Ruler of the universe, that you may long remain a

safe support of this very flourishing state, its citizens' delight, and an illustrious cultivator and patron of the good arts, and that we, as long as possible in this modern age, may enjoy that peace and tranquility which have hitherto been abundantly vouchsafed to us under the auspices of yourself and your most illustrious colleagues. Finally, myself and my studies I again and again commend to your favour, and as long as I live I shall be your most ready servant in all the duties of a good citizen, and a perpetual admirer of your high dignity.

JOHN CONRAD AMMAN.

Amsterdam, 1*st Feb.*, 1700.

AMMAN'S PREFACE.

CANDID READER,

This Art of instructing the deaf and dumb may seem to you new, and perhaps incredible; it is nevertheless not unheard of, for there have been certain men, as I have lately discovered, who have employed themselves in this pursuit; who they were, and what they have done, has been hitherto unknown to me, and I solemnly declare that before my thoughts became engaged on the subject, I never met with any vestige of the art in any author whatever. While I was instructing the *sixth* deaf-mute, circumstances made me acquainted with that celebrated philosopher, F. M. Van Helmont (now among the saints), who informed me of a certain Natural Alphabet, discovered by him some years before, by which he had instructed those who had been deaf and dumb from birth. But when he saw and heard me teaching, he acknowledged with the greatest candour, that I had not only not borrowed any thing from him, but that I had greatly surpassed him in practical results.

While this Treatise of mine was in the press I fell in with a paragraph of the very learned Paul Zacchias' in his "Questiones Medico-Legal," Lib. ii. Tit. ii. Quest. viii. n. 7, where he, out of Vallesius' Lib. de Sac. Philosoph. chap. 3, tells of a monk,

who taught deaf-mutes from birth to speak; the learned Italian contents himself with narrating the fact, but says nothing further. About the same time I received a letter from the celebrated Dr. John Wallis, Professor of Mathematics at Oxford, who informed me that he had not only attempted but successfully accomplished what I had made known in my book called "Surdus Loquens." This letter, together with my reply, I insert here by way of a Preface to my Dissertation, for I do not wish, like Æsop's crow, to appear before the public in borrowed plumes, but rather enable others to judge what I have done in common with so learned a man, and in what respects we differ from each other. Dr. Wallis says:—

"It was only yesterday I met with your Treatise entitled 'Surdus Loquens,' which, it appears, was published in 1692. I immediately read it, and more particularly because I had already employed myself upon the same subject. I commend your efforts, and wish you joy of your success. I do not know whether you have seen my Treatise De Loquela, on the formation of Vocal Sounds, which I prefixed to my Grammar of the English Language, first published in 1653, and reprinted several times since. There you will see many things common between us, and I believe you will not be displeased if I have written anything contrary to your practice or described sounds omitted by you. In the third volume of my Mathematical works, among the miscellaneous articles, in my Letters also (letter 29), you will find an account of my methods for teaching deaf-mutes, with particular reference to the English language. About the years 1660, 1661 I succeeded in teaching two men who were quite deaf by the means there described; they were able to speak distinctly and to utter any sounds

whatever; one of them is still living, or was a short time ago. I enabled them to articulate several words in the Polish language under the inspection of a nobleman of that country, much to his astonishment, as the words selected were such as the natives propose to others as the most difficult to pronounce. I have also taught several persons who stuttered or hesitated in their speech to articulate distinctly words which previously they were unable to pronounce, and foreigners by similar means have been brought to speak English words which till then had defied their efforts. I mention these details, not to diminish the credit due to your exertions; on the contrary, I beg of you to continue them; but I need not repeat here what I have already made known in my Works, which I believe will not displease you. Farewell.

Your obedient Servant,

JOHN WALLIS."

I replied thus to the venerable and learned old man:—

JOHN CONRAD AMMAN greets very respectfully the illustrious and very learned DR. WALLIS.

The perusal of the courteous letter you have sent me has given me the greatest pleasure. I see by it that you not only have read and approved of my Method for teaching deaf-mutes to speak, but that you also have formerly pursued a similar career. I congratulate myself that in this respect I have done something in common with so great a man, to whom I am in other respects as inferior as a star scarcely visible is to the sun, the father of light. Had I been able to have had you for my guide earlier, I should have been saved much labour,

which, from the natural slowness of my intellect, I have long had to go through. Your letter gave me the greater pleasure, as it reached me while my Dissertation on Speech was at press, and enabled me to announce that I was not the first, nor the only author on the subject, as I had long believed, for vanity, of all things, is foreign to my nature. I have at last obtained the third volume of your mathematical works, to which you refer in your letter. I do not so much wonder that your great ingenuity has hit upon this system as that there should be so remarkable an agreement between us in most points—a harmony which would countenance the idea that we had worked in concert, though at the time you were publishing your works I was not in existence, nor till twenty years later. Your very learned Treatise on Speech came into my hands only two days since, and I have read it with the greatest pleasure.

Having thus, learned Sir, briefly replied to your letter, I am going to express my opinion of your treatise with a freedom which I trust you will pardon; perhaps it may induce you to give me yours on my Dissertation if it deserves it. In my work entitled "Surdus Loquens," which appeared in 1692 (which was soon after translated into several languages, and among others into English, by Daniel Foot, a physician in London), only the German letters were brought under examination, the reason for which I have explained at page 25. There is nothing surprising then in your observing that there was no explanation of several sounds, but in this Treatise I speak of all that have come within my knowledge in the hope of increasing its utility. I only omitted them in my first book because I thought them foreign to my plan. I have arranged them in the order which

you will see in my Synoptical Table, which, I think, will satisfy you.

Like yourself, I have no idea whether the method we employ in teaching deaf-mutes to speak, and to correct the defects of articulation are the same as those of the Spanish monk, but you will agree with me that such inquiries into the nature of letters are ingenious and of practical application; it is therefore natural to conclude that since we agree in theory, our practice could not be very different. We cannot, however, deny that there may be a diversity of methods for instructing deaf-mutes, especially as regards the nature of the vowels, which are not always pronounced by all men with the same conformations of the organs. By opening the mouth in a certain way one person will pronounce *o* or *e*, and another with the same configuration produces *u* or *i;* I have made similar observations with regard to other letters. It is therefore requisite that a judicious teacher of deaf-mutes should promptly remedy any errors of this kind which may arise. In speaking of my own experience, I may say, without boasting, that my success has been satisfactory, as you will be able to judge on reading my Dissertation. I now come to the consideration of your admirable Treatise on Speech.

I should venture to add nothing to what you have written with so much ingenuity and aptness on speech in general. If however you will vouchsafe to read the first chapter of my Dissertation, you will find there some observations on sonorous and non-sonorous breathing which I believe you will not disapprove of.

I proceed to your description of the vowels and consonants, in which, as you have observed, you agree with me in many respects, it however appears

to me that there are several points which might be made clearer. It seems to me that you attach too much importance to the ternary number of each class of vowels. I have never been able to find more than one vowel purely guttural, namely *a*, as the Germans and nearly all nations pronounce it, from which your open *o* differs very little; your "slender" *a*, which most resembles it, you class among the palatal letters. It is, however, one of the vowels, as I have shown, composed of *a* and *e* united, and has the same sound as the German ä, the *ai* of the French and perhaps *æ* of the Latin, so that in my opinion it would be more correct to place this slender *a* among the gutturals than to place the feminine *e* there.

I have been striving to find out your reason for classing the *o* and the "obscure" *u* among the gutturals; if these letters correspond with the French syllable *eu*, in the word *sacrificateur*, they are then the same letter as the German ö and the Belgian *eu*, which however are formed by the vowels *o* and *e*, the one dental and the other labial, and which, united, form only one sound; for if in pronouncing the letter *e* we close our lips more and more tightly, we form the French *eu*, and the Belgian *u*.

I only recognise two pure dental or palatal vowels, which are *e* and *i*, these, as well as the labials *o* and *u*, or *w*, have a latitude of their own, that is to say, they are sometimes very open, and at other times less so, without, however, changing their nature in any respect. I think you have been led astray in removing your *y* (which is the same as the Belgian and German *j*), and also the *w* from the vowels, influenced by a certain difference in sound, which is perceived when the *i* is pronounced more openly after the *y*, or the *u* after *w*.

I have nothing to add to what you say respecting the labial vowels but that it seems to me that your "slender" *u*, and that of the French also (supposing they are the same letter), are not formed by opening the mouth less than necessary to pronounce your "fat" *u*, or your *oo*, but sometimes an *e* is added, as I have observed in the German ü and in the Belgian *u*.

I am not of your opinion as to the nature of perfectly silent consonants, as *p*, *t*, *k*. You think that they are already formed when the breath which produces them is intercepted either by the lips, or by the front part of the palate, or in the throat, while I assert their perfection requires an outward expulsion of the breath. With regard to the semi-mutes, *b*, *d*, *g*, my opinion concurs with yours.

I admire your accuracy in the description of the nasal semi-vowels. I do not know whether any one has remarked before how greatly the common *n* differs from *n* when it precedes *g* and *k*, although their difference is quite as great as that between the letters *t* and *k*.

You appear to me not to have distinguished sufficiently the diversity of the consonants which you call derivatives, as *v* from *f*, and *z* from *s*; it is true that each pair requires the same position of the organs when pronounced, but the distinction consists in this, that when *v* and *z* are uttered, a certain vowel sound is prolonged with them. I am surprised that you have not noticed that your *sh* (if it is really the same as our *sch* and the French *ch*) is nothing more than *s* somewhat strongly sounded. The French *j* has the same affinity with it as that which is found between the *z* and *s*. Not perceiving this, you incorrectly described your *j* or *g* when coming before *e* and *i*; these letters are in reality

composed of *d* and *j* of the French, not of *d* and your *y*.

I cannot satisfactorily discover your reason for casting the *y* and *w* out of the family of the vowels. Let us consider the manner in which these letters are formed and attend to the sounds they produce, and we shall find that they are only *i* and *u* rapidly uttered; if so slight a difference should exclude them, all the vowels might become consonants.

What I have said of your *j* I say also of your *ch*; this letter is surely not composed from *t* and *y*, but from *t* and the French *ch*.

If I were addressing a man less courteous and learned than yourself I should have to make many apologies for the liberties I have taken. I send you my Dissertation on Speech, in order that you may see the results of my labours, since publishing my first work, "Surdus Loquens," and I earnestly entreat you if you find any thing calling for your animadversion, candidly to tell me of it, and wherever I seem to you to be in error to correct me as a friend. Farewell.

JOHN CONRAD AMMAN.

Amsterdam, 31*st January*, 1700.

DISSERTATION ON SPEECH.

CHAPTER I.

On Speech and Voice in general, and also on simple, or inaudible breathing.

THE value of many important things is either not known to us, or most shamefully neglected till they are lost. How paltry in the eyes of the sluggish multitude is golden liberty! Scarcely one in a hundred, whilst they are in possession of sight and hearing, make suitable acknowledgments to their Creator for such distinguished blessings. Few except invalids pay any attention to their health. Thus it is with respect to *Speech*, that inestimable gift of God, in which both the infinite wisdom of the Creator and the

dignity of the speaking creature are prominently displayed, but which nevertheless, because we generally acquire it through our natural powers with little or no labour, and almost unconsciously, we consider to be born with us and granted to us by some law of nature; and from this cause we undervalue it until deaf and dumb persons come under our notice, and teach us to estimate our own advantages by their privations. How dull are they in general! How little do they differ from animals! especially if their parents and relations have neglected them, and taken no trouble by nods and signs to get rid of their natural incapacity and produce a certain manner of thinking. And even if their parents are most attentive to them, how inadequate and defective is the language of gestures and signs which they must use! To how few relatives and friends is their intercourse restricted! How little do they comprehend,

even superficially, those things which concern the health of the body, the improvement of the mind, or their moral duties! Who does not pity their wretched condition? who will refuse to relieve it by all the contrivances which can be devised?

But it is an aggravation of this heavy calamity that the appliances of medicine and art have been believed by every one, as far as I know, unavailable for its relief, and that it has been ranked among incurable evils. After close investigation, I found that most of the mutes have their organs of speech perfect, and that they are speechless because they are deaf; and although I have despaired to apply a remedy for removing their deafness, I have a different opinion respecting Speech. For human speech, as will appear to every one who considers it with a little attention, is a certain combination of many different kinds of sound, the variety of which arises, in my

opinion, from the various motions of certain organs, which if they were sufficiently visible, I should think, would suffice for the deaf to discern them with their eyes, just as others receive sounds through their ears, and thus, in time, they may learn to speak.

The experiment I tried first on myself before a mirror, and immediately considered it both useful and practicable; perceiving no less difference between those motions than between the sounds themselves and the characters expressing them, and from that time I wished to have some deaf person to instruct. The friends to whom I communicated this idea, and whom I asked to assist me in finding a pupil, laughed at me as a crazy mathematician; but their opinion was soon changed when I brought a deaf pupil before them, some time after, able to speak and to read. The ice being broken, I did not desist until I had brought my

enterprise to perfection, and I found that I could, with the divine help, render the condition of the deaf not only more tolerable, but also, as my daily experience proved, superior to the common lot in one respect, that they can understand others when speaking in the lowest tones by carrying (as it were) their ears in their eyes.

Some years ago I published an account of the method by which I effected that object, from which foreigners might imitate it; and as soon as I heard that it was being practised in England and Germany I determined to lay open the whole art of speaking; to explain at greater length those principles and rules which I had before only sketched; and, in short, to publish this Dissertation for the good of mankind, free from any invidious motive, and from the desire of gain.

Before I make any observations respecting *Speech*, I would enter a

little into the natural and probable causes by which men, living in society but not yet skilled in speaking, might and ought to introduce some sort of practice in speaking among themselves. First, speech is a really wonderful convenience and stupendous faculty for expressing every thought. Let us suppose the inhabitants of the globe to be in absolute ignorance of any kind of language, yet equally gifted with the same sympathies as ourselves, and consequently possessing an intense desire to discover the thoughts of others and to communicate their own; it is very likely that they would leave nothing untried to effect this object, and eventually, finding that except by means of signs perceptible to the senses they cannot, in this corrupt state, impart the abstract sentiments of the mind, they would have recourse to the voice, giving it articulation and inflection by the various movements

of the tongue and lips. Such motions are easy and the sounds produced by them are very distinct, and although few in number, their combinations are capable of such infinite change that whatever is conceived may be expressed by them. They can also be made without the interruption of other work; may be distinguished at a considerable distance, in the dark also, and by the blind; so that *hearing* seems to be given to man chiefly in connexion with *speech*.

But unless people were at first directed by the same mind it would be a necessary and an inevitable consequence that each individual would, in this manner, create a language of his own, and thus cause confusion for a long period; and perhaps such efforts would never be reduced to the form of a methodical language. All this will become clearer as we proceed.

There is still a very different

reason why men should desire to open the secrets of their hearts and the conceptions of their minds to others in *speech* rather than by *pictures*, *gestures*, or *characters*, and other things of this kind. Besides that certain signs, not uttered by the living voice, are liable to deceive, or are deficient in many important respects, every sincere mind, giving attention to itself when about to converse with another on a serious subject, feels a desire to declare the hidden thoughts of his heart, nay, to pour his own life into him, and that he cannot effect these objects so completely as by the use of Speech; for nothing emanates from us which bears a more vivid character of life than our Voice; neither have I gone beyond the truth in affirming that the *breath of life* resides in the voice, transmitting its light through it; for the voice is the interpreter of our hearts and signifies its affections and desires.

Hence, in these impetuous commotions of the soul which it is unable to repress, the mouth is forced to speak "out of the abundance of the heart." So also when we dwell upon something in our own minds which either from fear or shame we hesitate to utter, the heart travails, as it were, and is in a state of anxiety until we have poured it into the bosom of a friend, then the anxiety at once gives way to serenity, and it can truly be said that we have opened our hearts; for so the soul liberates itself, through the voice, of the burden which oppressed it, especially if unfeigned tears accompany it. So full of life, gushing straight from the heart, is the voice, that to speak long is a great fatigue, especially to those people who speak when the heart does not go with them, or cries out against them; and also to the sick, whom the spirit leaves at the same moment as the voice, when they have uttered but three or four

words. To say much in few words—Voice is a living emanation of that spirit which God breathed into man when he created him a living soul.

It is not surprising therefore that men so desire to open their minds in voice and speech, those even who never heard its sound in their ears, such as are born deaf, for they laugh, they exclaim, they shout vociferously, they weep, they sigh, they groan, and thus they express the chief impulses of the mind under certain modifications of the voice, as will appear to an attentive observer, indeed they signify scarcely any thing by signs, without uttering unknown to themselves some sound with them. So also the *exclamations* of almost all nations, called *interjections* by Grammarians, differ little from one another; *a* or *ah* is generally expressive of joy and admiration; *i* of indignation; *o* of commiseration, or of exclamation; not to mention many others.

These are my conjectures respecting the invention of Speech, if it was an invention; but as it is according to the testimony of Scripture of the same antiquity almost as the world, it probably cannot be called a human invention, but should rather be acknowledged to have been imparted to the first man when he was created by that Eternal Word whose image he was, to be bequeathed in all its integrity to posterity if he had not sinned. But *the Speech* which now prevails among men, has so degenerated from that which was first bestowed, that it scarcely deserves to be called its shadow, and may be a mere device without which we should be mute, as those who are born dumb may sufficiently prove; wherefore I have determined to investigate more deeply the origin of both kinds of speech, and, the deplorable difference between them being shown, to direct my discourse to the latter.

Without longer delaying the reader I shall say concisely and candidly what has occurred to me on this subject, in the following order. I shall divide this Dissertation into three principal heads. In this first part I shall make some observations on Speech, its origin and its organs in general; then bring under examination the materials of which letters were made, i.e., the voice and the inaudible breath. In the second part I shall explain the letters themselves and the various methods of forming them. In the third part I shall teach the manner of instructing the deaf and of correcting the defects of speech.

To make it appear more evident that the origin of *primeval Speech* is divine, I will state some preliminary axioms of indisputable truth, by which it will be shown from the nature of God, that creatures formed in his image ought, of necessity, to be able to speak, and in this respect

resemble their Creator. These are the axioms: *Whatever lives, acts and operates according to certain laws prescribed to itself;* for to live and not to act is almost the same as to be and not to be; and again, *Whatever is produced by another, bears witness to the nature of the Cause producing it.* Since God, therefore, is the Father and eternal Fountain of all life, who can doubt that he always and constantly acts according to his own nature which is truth itself, and which is to himself in the place of law? This divine operation is eternal Justice itself, and the most sacred law of universal created Nature. But since we know by faith that this world has not existed from eternity, and yet that there is no shadow of change in God, it follows that his operation is as much an internal one, which in scripture is called his Wisdom, as an external one, by which, through his Omnipotent word, he commands that

which he ordained to exist of itself, and this is called *Creation;* for to create is to give being to ideal existence, and to command that *that* which previously was a part of the Creator should exist of itself, yet subject to the law given to it in its creation, as is abundantly shown in the first chapter of Genesis.

At last, the eternal Word having produced the whole host of creatures, to each class of which he gave its own perfections, wished to manifest and, so to speak, to represent himself in some one creature as in a living mirror, and created Adam, that is Man, in his own image, and commanded him to subject the land and sea and all the host of them to himself; but to the end that he might properly exercise this empire over them, it was necessary that Adam himself should have effectually the power of commanding, the force of which consists in an emanating *word.* Wherefore, in addition to

other innumerable gifts, God distinguished him by that of *Speech*, by which he might recal not the least part of that divine image. For naturally empire is only given over that with which he who exercises it is intimately and vitally connected, and which he penetrates; but in the nature of things penetration is not possible except to luminous emanations from the source of light, and therefore God has given to man the power of propagating by his living voice effective rays of his own life into the creatures subject to him; for as the Omnipotent, when he speaks creates, "Jehovah spake, and it was done," i.e., by pronouncing the Ideas of things to be created he commands them to become creatures, so man has the power not only to perceive these same ideas in his Creator, and to his honor express them with his voice, in accordance with the nature of things, and so praise Him, but by *speaking* to effect whatever he

wishes, according to the laws of his creation.

This divine manner of speaking, because it requires an intimate union with the Creator, which has been lost through the prevarication of man, has, with many other gifts, almost perished from the earth; and in the course of the ages which have gone by since the fall of Adam, this precious prerogative has been granted only to the most holy men, whose souls were united to God by a fervent spirit of devotion, and who were also endowed with the power of working miracles by vividly uttering the very essences of things, who have thus proved to the rest of mankind how they have lost their empire over nature.

Jesus Christ, our Saviour, that other Adam, the restorer of that which the first Adam had lost, said that nothing was impossible to him who believed, who placed faith in God; and he illustrated that saying by examples taken from speaking.

What are all the miracles which he performed but so many witnesses of the power which was granted to him over nature? As often as he desired to exercise that power he performed what he wished by commanding in *words*, emanating from that internal and divine Word; but each command supposes a corresponding word, whether internal only and spiritual, or its external and material image, which however, if without the spirit, is dead and of no effect. What, I ask, is the casting out of demons, healing diseases, raising the dead, in the name of Jesus, but to accomplish all these things by pronouncing words animated by the Spirit of him who is the Eternal Word? Nor is it without reason that these miracles were done in the *name* of Jesus rather than by any other means, for *name* is something peculiarly attributed to enunciation.

This method of speaking effectively, i.e., having your commands imme-

diately performed, as I have already stated, is not only of rare occurrence, but it is treated with bitter derision by those who pertinaciously deny to all mankind, of whom they consider themselves the arbiters, whatever is denied to themselves. With equal absurdity might those who are born blind or deaf maintain that other men neither see nor hear, since to the one light and colour, and to the other sound and speech are not less a mystery than is the state of a perfect and regenerate man to those who contend against mystery while they are themselves under corruption. For this reason I have explained these things at some length, although they are not a part of the design of this Dissertation, in order that the primitive origin of speech may be manifest, and that we may conceive what it will be again in the state of regeneration, when we shall see no longer through the dim mirror of reason, but through

the divine light, and being instructed by God, we shall again use one language and understand one another without an interpreter.

I pass therefore to *Speech*, as, since the fall, it has descended to our times, which, imperfect as it is, is an evidence of man being created after the image of God, but at the same time a most melancholy proof of his fall; because it is not only deprived of its original force, but it is very imperfect; for we do not now speak from a certain innate knowledge of things, but as we have learnt from our parents and others. Without this instruction, as I shall presently show, we should have remained altogether dumb. Our method of speaking, as is evident to any one who attends to it, consists in the rational combination of a great number of syllables, and syllables are framed from the apt and successive pronunciation of various sounds and

breathings, which are called letters; therefore I thus define it:—

Speech, or if you would rather, *speaking* is an action of man, who, by certain organs, which he has learnt to move by long and frequent practice, is enabled so to inflect and articulate his breathing, whether sounding or not, that the words formerly taught him by means of his hearing, and uttered again by means of those organs, may excite in others the ideas which were in himself.

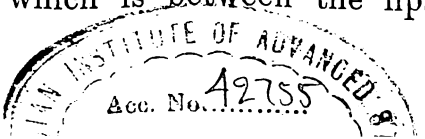
If any one wishes to have a shorter definition of *Speech*, I say, that it consists in the utterance by the voice of ideas which articulate words have left in our minds.

But since in an inquiry so difficult a simple definition is not sufficient, I will place before my reader its several parts, preserving the same order as in the definition.

It will seem surprising to no one that I have called Speech simply a human action; although it is

evident from the sacred writings that angels also have very often conversed with men, and that they celebrated the Creator with their voices; and we may daily hear parrots, magpies, ravens and birds of that class speak by the instruction of men. But besides that my object is to treat of *human* and not *angelic* speech, this latter ought not like ours to be called artificial but natural. The above-named animals imitate only a few words, and these are unintelligible to themselves, nor do they know how to maintain a discourse among each other: for this reason their speech does not seem to me a fit subject for serious investigation, for he who does not understand what he speaks can scarcely be said to speak.

The organs of Speech are considered by the unlearned to be either the mouth or the tongue, but inaccurately; for in whatever sense *mouth* is taken, whether for the opening which is between the lips



and teeth, or for that cavity which is behind the teeth, it will only be a single instrument in speaking. The *tongue*, although the chief of all these organs, is however so far from being the only one, that even when it is most perfect, speech may be very much impeded and almost destroyed if the jaws, the palate, lips, and other organs be malformed; on the contrary, if the tongue be either cut out, or from any cause immovable, we can still correctly pronounce very many letters,—among the vowels, *a*, *o*, *u*; among the semi-vowels, *m*; among the consonants, *b*, *p*, *f*, *v*, *h*, which I will explain at greater length when I treat of single letters.

Since however a distinct knowledge of the organs appertaining to speech is in the highest degree necessary, I will now treat, at some length, of each of them. I shall not dwell as an Anatomist on certain minutiæ, which do not refer immediately to the subject of inquiry, and

thus increase the bulk of my volume, but I shall describe or depict their structure, such as is required for the perfection of the voice and speech, and such as it generally appears.

It is manifest at first view that an audible breathing or voice, and an inaudible or simple breathing are most of all required for speaking. That this however is not of itself sufficient, those born deaf and all who are deprived of speech bear evidence, being generally capable of producing some sounds, and of breathing clearly. Since therefore the voice and speech do not always and everywhere advance with equal step, I shall divide the organs of speech into those which serve to form the voice and breathing, and others which serve to articulate the same and change them into various forms.

The voice and breathing have common organs, and they are either remote or immediate. The remote

are all the organs which assist the breathing, and especially that part of it called expiration, as the lungs with the windpipe and the bronchials, the ribs with the intercostal muscles, the diaphragm and most of the muscles of the abdomen, all which combine to drive the air into the air-passages of the lungs through the windpipe, and to bring it back again into the bowels, just as wind is alternately received into and expelled by a pair of bellows. This air is sometimes sonorous and is called *voice*, sometimes it is the mere breathing action which is called *breath*. From these circumstances, properly considered, it is evident that the organs of respiration are the remote cause of both no less than of Speech, and, as they say in the Schools, the *sine qua non;* for although air is not always audibly breathed, voice and speech are connected so closely with respiration that they are never found without it.

Concerning simple and inaudible breathing, I shall add nothing to what has been stated; for it is air in no way affected, such as we commonly emit by breathing through the mouth or nostrils: while we have to discover what renders it audible when it is breathed, or, which is the same thing, what is the immediate organ of the voice.

No one has up to this time doubted that it is the *larynx*, or head of the windpipe, which is a union of certain cartilages, in themselves inarticulate, and it is universally believed that the voice is formed by breathing out the air through the cleft of the larynx being more than ordinarily contracted in the act of breathing: This is exemplified by the flute and other wind instruments, where the air seems to be made sonorous by merely narrowing the channel through which it passes. But there are many cogent reasons which induce me to think it is not so.

I. In these instruments the air is not rendered musical so much from the narrowness of the tube, as from the mode of breaking it up, or forcing it into a tremulous and very rapid undulatory motion.

II. Trial has convinced me, and the same experiment is open to any one, that the air which is forced with the greatest effort through the larynx will not of itself, against our will, even when most contracted, produce sound; but being breathed out in another way, with little labour, and through a much wider opening of the larynx, it becomes vocal. This is not the general opinion.

III. It often happens that the use of the voice is taken from us for a time, through a catarrh, although we are able to open and close the aperture of the larynx.

IV. Sound cannot be produced by any art in the larynx of the dead, although I have seen a certain

ingenious anatomist by some sort of trick counterfeit the voice.

V. I very much desire to know how great an opening of this aperture is required for the formation of the voice, for I have learnt from constant observation that we, in our usual tone of speaking, do not draw out a sound by a fourth or at most, by a fifth part differing from the lowest note we can produce in singing, which however is brought out by the same aperture of the larynx as that through which we always breathe.

Led by these and similar reasons, I endeavoured to account for the origin of the voice from another source. No one will deny that the larynx is the immediate organ of the voice; but the method of producing sound from breath seems to me far different from that which was before described, and in order that it may be completely intelligible, I shall explain very briefly the mechanical

structure of the larynx. It consists of five cartilages, firm and smooth, and possessing remarkable elasticity, which leave in the middle an opening for the passage of air and sound. These are not only connected together by ligaments and joined with amazing ingenuity, but also by several pairs of small muscles peculiar to the larynx, with which, by means of the nerves springing from the sinuous intercostal pair, as also from the harder root of the auditorial nerve, there is the most complete union and connection with the ears, eyes, and almost all parts of the face, with the heart, diaphragm, and chest; and, as is evident from their origin and insertion, they act with united strength, and preserving their equilibrium, they in this manner keep the opening of the larynx in the same position; which, however, I do not deny they might change, if some of them could act independently of their opponents; but no one will be

bold enough to assert that he has the power of giving a separate motion to any pair of those muscles, whether designed to expand or to contract the aperture, without the act of speaking, but which he ought necessarily to have the power of doing if their motion were merely voluntary.

It now remains for me to state that when we desire to speak, we communicate a vital force which proceeds from the heart and brain to the muscles of the larynx, which immediately act upon the cartilages to which they are attached, but as their power is impeded by the resistance of the cartilages, and these in their turn by the action of the muscles, a vibrating and tremulous motion ensues, which being impressed upon the air as it is breathed out, and at the same time communicated to the bottom of the chest and the bones of the head, renders it sonorous. The same result follows when you rub with a wet finger

the edges of a drinking-glass, an oscillatory movement is produced, which on striking the air causes sounds, and at the same time very marked undulations are observable in the water in the glass. Similar sounds may also be produced by rubbing the wet finger upon a thin, smooth board until it advances only by little jumps, for the air, by the alternate motion of pressure and resilience, puts all the parts of the board, as well as the contained air, into a tremulous motion producing in us the sense of sound, just as is done by simply rubbing with the finger. Something of a smilar kind is observed in most flying insects, especially in the great fly which makes so loud a buzz not so much by the wings, for it continues if these be cut off, as by the quick, and as it were, vibratory motions of muscles lurking in the hollow of the thorax. In men we have observed two motions of this sort; one on the tongue when

we pronounce the letter *r*, the other in the lips when we murmur through them to please infants. Thus that much talked of opening of the larynx serves to make the voice, now so much cultivated, deeper or shriller, as we shall learn from what follows.

These considerations plainly show the difference between the voice and a non-sounding breath. It is of great moment that the difference should be known, for by this knowledge we can teach Articulation to those who are born deaf; for they would not know the meaning of the distortion of the mouth into various shapes, unless we could show them the palpable tremor of the larynx. All men have two different ways of speaking, although the reason is unknown to them, for when they wish to be heard by any one who is sufficiently near they use their ordinary voice, making the air sonorous as they breathe it in the larynx; but when a person speaks

in a whisper he is careful not to excite that tremor in the larynx, and restrains the organs of speech so as not to produce sound.

Thus far I have illustrated the nature of the voice and of silent breathing; now it is requisite that I should describe the organs which modify the one and the other into their various forms; but I have thought it right first to explain certain phenomena of the voice according to my own hypothesis.

Every one will see from what has been already stated, how it is that the use of the voice is lost when the windpipe is severed below the larynx, or when the nerves of the larynx are bound, obstructed, or divided. But it is not so evident how catarrh, small-pox, burning fevers, and excessive shouting sometimes produce hoarseness and a complete failure of the voice. In all these cases the cartilages of the throat, which are moderately dry, solid, and smooth,

and of the nature of resounding bodies, become covered with a glutinous substance which issues too copiously from the excited glands, and hence they lose their elasticity. The same effect is produced in bells muffled with cloth, and also in flutes and other wind instruments when they are rendered too moist by the breath.

We have also to inquire what makes the voice deep or sharp. There is a twofold reason for this phenomenon, for if the voice of one man be compared with that of another while both speak in their ordinary tone, we may conclude that the dissimilarity arises from a difference in the magnitude and thickness of the cartilages of the throat, for the larger the cartilages the greater and slower are their vibrations, hence the deeper the voice. So also the contrary. But if it should be asked by what contrivance the same man at one time

utters a deep tone and at another a sharp one, we answer that the larynx has muscles uniting it to other parts also, such as the sternum, the hyoid, &c., by the aid of which, it may be either raised and its opening compressed, or lowered and its opening enlarged. The voice therefore, for the reason alleged in the former case, by passing through a contracted passage is made sharp; but it becomes deep and full when the passage is opened wide; and on this knowledge the art of singing is founded, but those sounds which are emphatically called tremulous arise from the rapid and reciprocal alternations caused by muscles which raise and depress the larynx.

And here another question arises, Why does the voice sometimes fail us when we wish to make it either shriller or deeper than its usual pitch? It is chiefly from this cause, that the larynx being so raised or depressed by the effort, cannot be

controlled by its own muscles, and the effort consequently occasions great pain in the throat.

It is well known to every one that the voice undergoes an alteration about the time of puberty, and becomes unequal, hard, and rough; and if the cause be examined it will be found to proceed not only from the connexion of the genitals with the organs of the voice, by which, at this time, the cartilages and muscles of the larynx become thicker and larger, especially in males, but from the other bones attaining their true strength and hardness, by the creation of more heat, whence the voice becomes at length firm and full; for the larynx is not the only part which ought to tremble, but almost all the bones of the body, as any one may easily perceive in himself by laying his hand upon the back, the chest, or the head; but those men whose larynx and bones undergo only a slight alteration, always have a feminine voice.

Hence, also, it is evident how we may almost always distinguish from one another boys and grown-up women by the voice, although it is equally shrill in both, for as the bones of the boys on account of their softness are less elastic they have a duller voice.

It is superfluous to describe by what means the voice remains smooth and shrill, of those who have at an early age lost their virility, as the reason is obvious. It remains to be seen on what account the voice suddenly changes from one octave to another when we do not want it to do so, and, as it is commonly described, becomes broken. Two things are to be noticed here—the time and the way in which this happens. It occurs to every one who stretches his voice too much, but chiefly to public speakers who have pitched their voices too high and spoken in stentorian tones till they are hoarse; but how it happens

flutes and harps teach us, that is to say, when any obstacle divides an ordinary sound into two, for if the two are equal, the tones harmonize, each is an octave higher than the former, nor can they be distinguished from one another; but if they are unequal, two different sounds are uttered at the same time, one of which is deeper than the other, and this is called a broken voice.

It is not only by the sound of the voice, as it is formed in the larynx, that we recognize our friends, although we may not see them when they are speaking, but by the manner in which that sound is converted into letters by the other organs of speech, for there is a palpable difference in the pronunciation of most persons.

I will add a few observations concerning the manner in which we often unconsciously, or rather involuntarily break out into a loud voice, when we laugh, scream, or groan. It may

indeed, be truly said that our constitution is so framed that whether we are affected with sorrow or joy, it must be expressed in the voice; but another cause may also be assigned, viz., the before-mentioned connexion through the nervous system of the larynx with the ears, the eyes, the countenance, and above all with the heart; for whenever the nerves are violently affected in any way, the larynx with the neighbouring parts are correspondently affected, and thus are produced sounds of various kinds which form a peculiar language, a language which all nations, including the deaf, both speak and understand, and which, although it may belong to the merely sensitive part of the system, may yet serve to show how natural and universal that language was, which, being made carnal, we have almost lost together with our mental knowledge.

I come now again to the organs peculiarly connected with Speech,

and which give the voice and breath power to form into the various combinations of letters from which language results. These are either only passive, or active. The passive organs are the two passages through both of which the breath, whether converted into sound, or only the agent of respiration, is forced out; for it is collected within the jaw as in a place from which there are only two exits, and must find its way out through the nostrils or the mouth, unless it meets with some obstruction. Of these two passages the most important is the interior cavity of the mouth, extending from the bottom of the fauces to the teeth, and having the tongue and the palate for its boundary, to which also belongs the opening bounded by the lips and the teeth, and the space between the teeth when the mouth is opened. The other passage is the aperture of the nostrils which extends to the fauces, from which the

voice and breath escape unless the tongue or the lips obstruct them. These passages are so constructed that one being open, the other immediately closes, or the reverse.

The active organs of speech are those which direct the voice and breath, however it may be formed, to pass at one time through this passage and at another time through the other. These are the tongue, with the hyoid bone, the uvula, the jaws, including the teeth and the lips. The tongue is a part of the human body not necessary only for speech, but for various uses, such as for tasting, for distributing food to be masticated, and for swallowing what has been masticated. The hinder part of it is closely connected with the hyoid bone and with the larynx, the lower part by certain muscles and a ligament which acts as a curb, called the tongue-string; but the rest of the lower part, with its sides and all its surface which

serves for tasting, is at perfect liberty, nor can it be confined without an obvious and decided injury to the speech.

The substance of which the tongue is chiefly formed consists of sensitive fibres of all kinds interwoven in a most wonderful manner, crosswise, like net-work. Several pairs of peculiar muscles also belong to it in common with the hyoid bone, which act as a sort of fulcrum to it. It is by these muscles that the tongue can be put out and drawn in, raised and lowered, widened and contracted, folded up, applied to the palate and the teeth, and suddenly withdrawn, and, in short, its whole oscillatory motion carried on. By these its various motions, the course of the voice and breath is directed either through the nostrils or mouth, in a full or thin volume, in a continuous stream, or in a sudden explosion between itself and the palate, or between its sides and the cheeks, or lastly between the teeth.

The bone called *hyoid*, on account of its resemblance to the Greek letter U, is the base of the tongue, and from it spring several pairs of muscles which give motion to the tongue and the larynx, but the use of this part is in some degree peculiar; i.e., it serves to raise the tongue, the tongue being drawn up with it, and by elongating it together with the annexed windpipe to render it narrower and thus sharpen the voice; but when the bone is pressed down by the muscles of the sternum acting upon it, it makes both of them shorter and at the same time wider by its heavy pressure upon the larynx, and thus deepens the voice. For, as often as we change the voice, we lift up or depress the larynx, and these two movements produce either a deeper or sharper sound, which any one will perceive by putting his hand on his throat, and changing the voice from deep to acute, and again from acute by

degrees to deep. For this reason some musical people can change their voices, and sing with equal facility either in the lower or the higher key.

The *uvula* is a certain little piece of flesh, soft and glandular, suspended in the middle of the arch of the palate by a very movable membrane, which so far as it assists the speech, with the membrane just mentioned of the voice as formed in the double way of the fauces, regulates its rushing through the nostrils; for when we wish to emit voice or breath through the mouth only, which may happen in the pronunciation of the letters which in the following chapter I shall name explosives, we shut the passage of the nostrils, as with a valve, but if it is wanting, or the opening of the nostrils into the fauces is too large for it to close, the letters *p*, *t*, *k*, are spoken through the nose in a disagreeable manner. This is perhaps the chief, if not the

only reason, why brute animals are destitute of this small organ.

The jaws, which may include the teeth and the space between the lips, as they necessarily open and shut the orifice of the mouth, form the voice and breath, by restraining and sharpening them into the various letters. On this account before children get all their teeth, particularly the front ones, they cannot pronounce several of the letters, and old people who are toothless pronounce the letters *s*, *f*, and *i*, very indistinctly.

In the above observations I have described but imperfectly all these parts, because the object of my work does not require a more thorough knowledge of them, and because they have been described elsewhere with more exactness by various anatomists, so that I have nothing to add concerning their structure; but I shall be obliged to make a few remarks on the use of these organs not dwelt upon by others.

What I have said in my definition of speech concerning the motion of its organs—by long and frequent use to be learned—I do not wish to be taken in this sense that this motion, as motion merely, is due to any art, but only so far as the human voice is articulated by it; for in the former sense, the motion of those parts is natural, and in a manner born with us, but not so in the latter. Not only are we born speechless, or without speech, but no one is able to teach himself to speak, though most of the arts have been acquired by self-instruction, so that if anything speech ought to be considered as an art, nor would it be incorrectly described as the Art of Speaking.

Nor is it opposed to my views that some desire is born with us of expressing the thoughts, especially the passions of the mind, by the voice, as we witness in the deaf and dumb, although there is a wide difference between their harsh sounds

and the really human voice as it is required for speech. These ejaculations are common to all, even to mutes, but speech, like other arts, is cultivated. Though I do not deny, as I have already admitted, that if men, not indeed deaf and dumb, but such as have never learnt to speak, were to live alone, that they would make some new language, but for three reasons a very imperfect one.

I. Because they have no knowledge of letters, and are absolutely ignorant of the use of the organs of speech, therefore they would utter to one another sounds which are either not imitable or at least unintelligible; inasmuch as the genuine pronunciation of letters was no less a gift of the Creator than Speech itself, and it is only the very rude remnants, which have still remained fixed in the memory, of the lost natural language.

II. Because they could scarcely ever agree among themselves upon

the designation of any thing, or they would not understand each other.

III. They would be unable to communicate to each other abstract ideas, although they might agree upon the names of things obvious to the senses. They would make in this way a language but little more perfect than that of those brute animals which communicate with each other by different sounds. Thus we hear cocks calling to their hens, and the latter clucking to their chickens; swine which are in danger calling the herd to their assistance with a snort; dogs, cats, and serpents when angry and quarrelsome expressing themselves by barking, mewing, or hissing. But if men, speaking different languages had to live together, they would construct a new one composed of all. Our modern idioms, and above all the English and French languages, attest the truth of this.

As soon as we are born, many external objects attract us, and exert their influence over us by various movements which are not effaced when the objects are absent, but leave behind them traces of themselves, or ideas which afterwards become the principles or elements of many thoughts and actions; for they do not lie buried, but like that seed which is sown in good and prolific soil, they come to maturity and perfection.

Among these innumerable objects are sounds and articulate words of various kinds, which, prompted by love, awaken by degrees the faculty of speech if there is no defect in the organs of hearing, and this effect is produced by the intimate connexion of the ears with the organs of the voice; for as soon as we have learnt the signification of any word, which always happens before we have learnt to speak, the idea conveyed by it acts no less effectually upon

the same organs by which it was conveyed from others to ourselves; hence by repeated trials we endeavour to imitate it until we see with delight its resemblance to the original, and thus by degrees we learn to speak our own vernacular tongue.

But they (I say this parenthetically) who are either deaf from birth, or very stupid, or who are brought up in exclusion, or, which rarely happens, those who are unable to elaborate the ideas of words, though the ideas are rightly perceived and understood, and their organs of speech are perfect, and those who have organs clearly unfit for speech, can never learn the art of speaking.

Thus it appears there may be four or five kinds of Mutes. 1. The born-mutes and those who have grown up away from all human habitations and society, may be classed together, for as they have never heard the sounds of the human voice they are unable to utter them,

and thus are Mutes. 2. Idiots, who are so deficient of intellect that they cannot understand what others say, and for this reason will never speak. 3. The reason why such as have very defective organs of speech cannot articulate, is obvious from what has been already stated. 4. But they who understand what others say, and whose external organs of speech are not defective, and yet are unable to speak, are rarely met with; indeed I have never seen more than two or three such instances. From them I have inferred that the connexion between the organs of speech and hearing is not always close enough to prevent a large space between them. Such a structure we find in persons who know how to distinguish musical sounds and musical time by their ears, but know not how to produce them with the voice, nor can ever learn so to do.

Those people who suppose that if infants were left to themselves, or

brought up among brute animals, they would speak a certain language —primitive, or natural to them, are mistaken ; for no reason can be assigned why they ought to speak this instead of that when they can acquire neither by ear. For this reason Jesus Christ, the Divine restorer of our corrupt nature, by healing those who were deaf (Matt. ix. and xii. and Mark vii.) effected a double miracle, for he not only made them *to hear*, but to understand others, and to articulate their own thoughts by the organs of speech. For if hearing alone were given to one born deaf, either by art or through a miracle, yet he could speak no more than a new-born child, until he had been taught a language. I have often been amused at the absurd opinions of different persons on this subject, who, believing that I infuse Speech into deaf-mutes with a little potion of medicine, complain that I ask too great a fee for curing,

or rather fee for teaching—whereas they do not know that I am put to immense and incredible labour for a year or so, in giving instruction to a single deaf-mute, and although the method which I pursue has nothing miraculous about it, the patience necessary to the practice of it is all but miraculous.

It will appear then very obvious to any one who takes the trouble to acquire a foreign language, that the art of speaking is not learnt without long practice, much less that it is natural, for sometimes he spends many years before he can pronounce its single letters correctly, even when his own language has for the most part the same letters. The French, the English, and the Italians scarcely ever clearly enunciate the *g* or *ch* of the Belgians, or the *k* of the Swiss; the Belgians rarely pronounce the *sch* of the Germans or the *ch* and *j* of the French: the *th* of the English is almost impossible to all

foreigners. The pronunciation of the Abyssinians and Caffres is a great labour to others. Now if we who have been so long accustomed to hear and to speak, find the pronunciation of another language beset with difficulties, how much more difficult will it be to the deaf and dumb even when their deafness is removed.

In my definition of Speech, I observed that it was necessary for the words to be so distinct that they might excite correspondent ideas in others, which is essentially necessary and without which speech is very imperfect and, as it were, no speech, for there are some persons who speak so defectively that they are unintelligible to others, but who think the fault does not rest with themselves.

I will endeavour to explain as a sort of corollary a double question concerning Speech, although this may not be just the place for it;

yet, conscious of my own inability, I willingly submit my opinion to better judges. (1.) It is asked, therefore, From whence and in what manner so great a variety of tongues was created, and (2.) how that miraculous gift of speaking in various languages which descended upon the Apostles on the day of Pentecost is to be understood.

The former part of this inquiry I answer thus;—considering that men spoke after the fall and still speak, not as we have already said, from any necessity of nature, but rather from the treasure-house of the memory, and speech has to be learnt by them from others like an art, it seems to me necessarily to follow, from the attributes of God, that He, when he created Adam in his own image, should so create him that his spirit, united with that of his Maker, had an intimate knowledge of inner things, and was able to express his ideas of those things in correspondent

language—an example of which he gave in applying names to his wife and the brute creation. But this intellectual language has been nearly obliterated through Adam's transgression, nor, except to a few of the faithful, who from their own spirit perceiving the spirit of their offspring, and the real nature of other things, have applied names suitable to them, has it ever been restored. The remaining part of Adam's posterity who have forsaken their God more and more, and completely darkened their internal spirit with carnal thoughts, have lost the true ideas of things, and with them that primeval language, so that they could no longer speak from an enlightened mind, but only from carnal and obscured affections. As soon therefore as the true knowledge of the primeval tongue perished, various ideas and opinions, formed from false reasoning, sprang up in its place; amid this diversity men assigned

different names to things, one striving to foist his notions upon another, until all were mutually unintelligible. The same thing prevails everywhere to this day. For there is scarcely a village in any part of the world which has not its own peculiar dialect, not elsewhere understood; the ridiculous names which are daily invented in the storehouse of a sportive fancy testify to the same thing. If any one will investigate the languages of various peoples, he will find, not only things themselves expressed by words very different from each other, but also a different construction of sentences, with various modes of expressing their ideas.

It is thus that I reply to the second question;—the minds of the Apostles, under the operation of the Divine Spirit, were pure, and so enlightened that they could comprehend the great things of God, and express what they comprehended in words suitable to so great a subject.

I scarcely believe, nor does the sacred text assert it, that they, individually, spoke in the tongues of all the nations that were present, but rather, that the faithful, who were desirous of hearing the wonderful things which those inspired men proclaimed, received their words so full of charity, like divine seeds into their hearts, as into a fruitful soil, and enjoyed the surpassing sweetness of them; while the others, not having ears to hear, considered the Apostles to be mad or drunk with wine, and did not understand them, for neither would such persons understand Christ Jesus, the fountain of truth and charity, though they heard him preaching himself.

There is as much diversity among speakers as among hearers, for the words of some are almost always dead and powerless, and the words of others seldom express what they aim at. It makes all the difference whether any one utters words fresh

and spirited from the warm feelings of his heart, or whether he speaks from custom only, concerning things of which he is himself doubtful, and the truth of which he does not feel.

NOTE BY TRANSLATOR.

Amman's reply to his second question, as to the gift of tongues to the Apostles on the day of Pentecost, is not admissible, being contrary to the sacred text. See Acts ii. 4, 6, 8, 11.

CHAPTER II.

Explanation of the nature of letters and the various modes of forming them.

HITHERTO our attention has been directed to the general subject of speech, viz., voice and breath, and the method of managing both, and especially to the difference between them, which it is necessary to know. It remains now to be investigated by what contrivance voice and breath, as apt material, may be formed into the several letters; for, the sole elements of letters are voice and breath, but the form of them is to be ascertained from the different configuration of the organs and passages through which they are transmitted. Letters therefore, not characters which are written as with a pen, but as enunciated, are the voice and

breath, or both together, d
modulated by the requisit
of speech.

The number of possible
scarcely able to be defined.
extend as far as the v
breath may be varied by t
of speech. Besides, mar
have their own compass an
modifications; and the san
ter, even in the same langu
always pronounced in on
same manner. Thus at c
and *e* are open, at anot
o and *i* have their own mo
&c. But this difference,
languages are compared t
of far greater moment, a
chief cause why we lear
much difficulty how to
foreign tongues, before
adapted our organs to son
tomed movement. Th
applies more immediate
instruction of the dumb
first perceived.

We see also that many men are born with the faculty of imitating the sounds of almost all animals, which, indeed, are for the most part compounded of letters wanting in our alphabet. Notwithstanding this profusion of possible letters, the most easy and simple and pronounceable without distortion of the organs of speech, have been adopted by all nations, as it were by common consent, which, indeed, intimates the higher origin of them. With them certain characters, chosen at pleasure have been connected, the number of which has rarely ever exceeded twenty-four: but these characters are not pronounced alike throughout the world, nay the same letter is variously sounded by the very same people.

One nation in expressing the signs of its letters has been much more ingenious than another. The most perfect method of designating letters and most correspondent to the nature

of the thing is, when simple letters have simple signs, and when these in turn designate simple letters. In this matter the Germans have decidedly won the palm from other nations; as their letters sound the same wherever they are placed, except that they frequently use the *h* silent to lengthen the preceding vowel. Their vowels are very simple and the use of them wonderfully convenient, the diphthongs thence compounded retain the strength of their component vowels, for they are heard in them more than in most living languages. For we find that the simplest vowels are sometimes written as diphthongs, as *au*, *ou*, *ai* of the French; *oe*, *eu* of the Dutch; or they use diphthongs so improper as that scarcely either of the two component vowels may be heard, like the *oi* of the French, or the *uy* of the Dutch, not to mention other examples; or again, so differently on account of difference of locality, are

they pronounced, that, if any English or French dumb person were placed under my instruction, I would teach him, from the beginning, not the French but German letters, otherwise he would necessarily be confused. Nor is the condition of consonants much better. So great is the discrepancy of their pronunciation, that there are hardly two nations which pronounce the letter *g* in the same way. I have heard that some native American tribe is without the letters *b*, *p*, *m*, and *f*, perhaps, on account of the rings which they wear through their lips, and, in the same manner, writers say that the letter *r* is not to be found in the language of the Chinese.

In my "Surdus Loquens" I have described the letters as they are pronounced by the Germans, but that I may be more intelligible to foreigners, I will here compare the languages which are in use in Northern and Western Europe with

my native German. All the letters of these languages may be divided, like the Hebrew, into labials, dentals, linguals, and gutturals, I might also add nasals, besides the common division into vowels, semi-vowels, and consonants; but since the tongue serves for the pronunciation of so many letters, the linguals may be easily confounded with the rest, especially with some gutturals; for which reason, I have thought it better to divide each class of letters according to the three regions of the mouth where they are formed, the organ and method of formation being at the same time added. They are exhibited in the annexed Synoptical Table in a certain natural order, along with the difference of their pronunciation.

This is the simplest and most natural order into which I have been able to reduce all the letters. It will be found more correct to the ear than to the eye, absurd as it

[Vide page 64.

SYNOPTICAL TABLE OF LETTERS.

All the letters are

- Vowels, which are pronounced in a clear voice and with scarcely any impediment, and these are
  - either
    - Simple, and without any mixture with others, such is
      - The guttural *a*, and the *e* of the French in the word *entendre*.
      - The dentals *e*, *i*, *j*, *y*, and the *ee* of the English, also *eo* in the word *people*.
      - The labials *o*, *u*, or *w*, which last agrees with *oe* of the Belgians, and *ou* of the French.
    - or Mixed, and that
      - either of
        - Guttural and dental, as ä of the Germans, *aa* in *aal* of the English, *ai* in *aigu* of the French.
        - Dental and labial, as ö and ü of the Germans, *eu* and *u* of the Belgians and French which correspond with them, the English and Italians are without them.
- Semi-vowels, which are pronounced with a vowel sound but with some impediment, and that
  - either through
    - The nostrils, which, from the part of the mouth where they are formed, are
      - either
        - Labial-nasals, as *m*.
        - Dental-nasals, as *n*.
        - Guttural-nasals, as *n* before *g* or *k*.
    - The mouth, the tongue assisting chiefly, which in forming them
      - either
        - Trembles, as in *r*.
        - or Not, as in *l*.
- Consonants, the power of which consists not so much in a certain sound, as in the different configurations of the inaudible breathing, and are
  - Simple, and these are
    - either
      - Sibilants, which can be lengthened or shortened at will, and these again are
        - either
          - Simply such as are formed
            - either
              - in the throat, as *h*, *ch* of the Germans and Belgians, *g* in *mugere* of the Spaniards.
              - among the teeth, as *s*, *sch* of the Germans, *ch* of the French, and *g* before *e* or *i*.
              - from the lower lip and upper teeth, as *f* and *ph*.
          - Those which are pronounced with a certain dilated sound, and these are formed
            - either
              - in the throat, as *g* of the Belgians, and some Germans.
              - among the teeth, as *z* of the French and Belgians, and *j* of the French.
              - from the lower lip and upper teeth, as *v*.
      - Explosives, which are sent out at one impulse, and are
        - either
          - Entirely mutes, which are formed
            - either
              - in the throat, as *k*, *q* and *c* before *a*, *o*, *u*.
              - about the teeth, as *t*.
              - near the lips, as *p*.
          - Those which begin with a gentle sound, to soften the harshness, are formed
            - either
              - in the throat, as *g* of the French and English before *a*, *o*, *u*, as also of most Germans.
              - about the teeth, as *d*, and, if I mistake not, *th* of the English.
              - near the lips, as *b*.
    - Double, these are composed of two
      - either
        - simply mutes, as *x* & *z*, as well as *c* before *e* or *i* of the Germans; *ch* of the English, *c* before *e* or *i* of the Italians.
        - lightly sonorous, as *j* and *g* before *e* or *i* of the English and Italians.

may seem that I have transferred the diphthongs *ou*, *eu*, *œ* into the family of vowels, made vowels of *j* and *w* out of consonants, converted two or three consonants into one, as *ch* and *sch*; and taken those which have ranked as simples, such as *c* before *e* and *i*, out of the number of the simples. But I am ready to believe that the candid reader will not impute this to me so much as to the anomaly of his own language if he will fairly consider the powers of the letters and consult his ears rather than his eyes and his prejudices, especially if he knew how to reject the vowels from the letters to which they have been added for the sake of pronunciation, and to bring to the examination that alone which is essential to every letter. I wish to observe as what is most important, that when I make words by the formation of semi-vowels and consonants, I do not understand such as are pronounced by boys in spelling

with vowels joined to them, as *pe*, *ef*, *ka*, *el*, *em*, *en*, *&c.*, but that only which is proper and essential to them, the vowels being omitted, and which technically distinguishes them from one another, *m* from *n*, *p* from *t*, *s* from *f*. It is incredible how much it would contribute to the facility of reading in mutes if they were taught to pronounce the letters in this way. I have taught boys, entirely ignorant of letters, to read by this method in the space of two days.

After the general division of letters into vowels, semi-vowels, and consonants, it appeared desirable to subdivide them according to the three parts of the mouth in which each letter is chiefly formed, as it would thus be obvious to the eye in what way the same voice and the same breathing, according as it is in the lower part of the throat, or about the palate and teeth, or near the lips, that it is seized on by the

organs of speech. Five, six, or more are found of each of the three classes, as of the guttural *a*, *n* before *g* or *k*, *ch*, *g*, *k*; of the dentals *e* and *i*, *n*, *s*, *z*, *t*; of the labials *o*, *u*, *v*, *m*, *f*, *p*. This distinction not being borne in mind no reason can be given why children who have such an impediment in their speech that they cannot pronounce ü, *n* before *g* or *k*, *r*, *k*, do not promiscuously supply any other letter, but for the most part use a dental of the same rank, as *l* for *r*, *n* for *ng*, *t* for *k*, ö for ü.

Before I explain, in order, the nature of the letters and the mode of forming them, I would warn the reader that as all letters, not excepting the vowels themselves, can be pronounced to a certain extent like breathing, simple and non-sounding, when, e.g., we whisper in another person's ear; so also the consonants, besides those which I call simply explosives, are capable

of being pronounced vocally or with a certain sound, and there are nations which so pronounce them. This does not at all affect my division, as will appear by the following observations.

Here I will anticipate the reader who without doubt will in the third chapter object, that this method of mine for the instruction of the deaf and dumb will always be defective, since they will never take in with the eye all the motions which we produce by the tongue and lips, &c. sufficiently to understand what others say; but, besides that the sight is not inferior to the hearing in acute sensibility, I assert that this is not necessary, if those things which are spoken are in some degree familiar to them. We very often do not hear the consonants pronounced by those who are at a distance, but we collect them from the vowels and semi-vowels mixed with them. This may be observed daily among speakers, and explains why, when

we listen secretly, or, as it were, by stealth, we are able to follow out the whole subject from some one word well understood, and thus it is that we can very seldom repeat a word brought from a foreign tongue, on the first occasion of our hearing it.

I will now pursue the letters to their origin, and so examine them separately, and, as the German letters will be my future standard on account of their perfect simplicity, I will compare them with the letters of other nations and show in what they agree and in what they differ. Foreigners will not only thus more easily learn our manner of forming them, but will learn how to instruct their own deaf-mutes with less labour. In this explanation I will also preserve the same order, as in the first division of them, and treat of them according to the three parts of the mouth where they are formed.

Vowels are the voice modified only by a different opening of the mouth,

and are either simple and uniform, as *a*, *e*, *i*, *j*, *y*, *o*, *u*, *w*; or mixed, which, out of two so coalesce into one that they may be pronounced together, in which respect they differ from diphthongs inasmuch as their vowels are pronounced successively. These mixed vowels are ä, ö, ü, which some languages are either destitute of, or do not clearly enunciate. But, of the mode of formation more will be said presently.

The first of the simple vowels is the guttural *a*, the most simple of all, the key of the alphabet and therefore the initial letter among all nations that I know except the Abyssinians, who, according to the learned Ludolf, make it the thirteenth. Although it may be pronounced by a varied position of the tongue, the common and most convenient method is by keeping the tongue at rest, gently stretched out in the mouth, without touching or only lightly touching the margin of the lower teeth. If,

then, the lower jaw is drawn downwards and the mouth is so opened that the voice formed in the throat does not strike strongly on the teeth or the lips, *a*, somewhat open, will be heard; but, if the lips are strained into a circle, as the Bojarii (Bavarians) do, it comes to *o*. The English pronounce their *a* in two ways, viz., either in the manner now described, as in the words *shall*, *call;* or with the middle part of the tongue more sent towards the palate, and thus make a vowel from *a* and *e* mixed, as in the words *James*, *have*. Sometimes they pronounce their *o* and *au* as *a*, as in the words *knot*, *shop*, *cause*, *&c*. So also the French pronounce their *e* if followed by *n* or *m*, as in the word *entendement;* which would soon be perceived by any one who had to teach a mute, for he will have to be accustomed to pronounce his letters in the same manner everywhere.

E, *i*, *j*, *y* are dental vowels, the voice in uttering them strikes more or less against the teeth; hence infants, although they say *papa*, *bo*, *&c.*, are unable to pronounce these letters until they have their teeth, at least the front teeth. And, indeed, *e* is formed whilst the voice, the lips being gently opened, is thrown against the teeth which are opened a little at the same time; but the position of the tongue ought to be such that the anterior part of it on both sides may be rather forced against the canine teeth of the lower jaw, while the middle of it being raised into a bow is moved nearer to the palate than is done in pronouncing *a*; for so the passage of the voice is made narrower, and *e* is much more distinct. The sound of this letter is the same in almost all languages, except that it is sometimes pronounced more open, sometimes closer. The English not unfrequently pronounce it like the *i* of the Germans,

as in the words *evil*, *ever*, while the French, as I have remarked, sometimes give it the sound of *a*.

I, *j*, and *y* are one and the same vowel in German, sometimes made rather short, sometimes long, nor is there any foundation for making *i* a consonant; *j*, or as it is called, *jota*, but it is only pronounced more rapidly that it may make a diphthong with the following vowel; in other respects the formation of *i* is almost the same as *e*, except that by pressing upon the teeth rather more, or by making the tongue more arched, or by doing both, the passage of the voice is rendered narrower, and consequently a sharper sound is emitted, which however can sometimes be scarcely distinguished from *e* close. *Y* is *i* lengthened more than usual, or doubled. These are the variations of this letter. The English pronounce *i* and *y*, and most of the Belgians *y* as *ei*, as *time*, *cry*, *wyn*, *tyd*. The *j* of the English,

Italians, and French will be treated of below. Among the English *ee* is always pronounced *i*.

O, *u*, and *w* are labial vowels, being formed by the different position of the lips. There is the same difference between *o* and *u*, as between *e* and *i*; but *w* is to *u* what *j* is to *i*. *O*, *u*, and *w* are formed when the teeth and tongue are placed the same as in *a*, but the lips are contracted more or less, as the teeth in *e* and *i*, and, in this way, when rather less pressed upon *o* will be produced, but when rather more *u* and *w*. Any one who is teaching a deaf-mute must be particularly careful, lest, while he is pronouncing *o* or *u*, the breath should be forced too much against the teeth or the tongue pressed too much, for then he would obtain *eu* and *u* of the French instead of the sounds he wants. These labial vowels are common to all languages, but are not expressed in all by the same

characters. *O*, indeed, is the same everywhere, though the French pronounce their *au*, or *eau*, in the same manner. The *u* of the Germans is the same as *u* of the English and Italians, but the French express the same by *ou*, and the Belgians by *oe*, when, indeed, it is a diphthong. *W* is *u* pronounced quicker and stronger.

The mixed vowels are the German ä, ö, ü, to which correspond *ai*, *eu*, *u* of the French. The Belgæ are without ä and ö; but ü they express, like the French, by *eu* and *u*. The English have only ä, which they express by their *a*, as in the words *take*, *make*. The Italians want all three. The characters of these vowels are peculiar to the German language and were devised with great ingenuity by our ancestors, although most moderns are ignorant of the reason. They have also a simple character, marked by a little e (or ..), since the sound which they

imply is single though mixed; for *a*, *o*, and *u* are so pronounced that the passage of the voice is contracted, the tongue and the teeth being formed to pronounce *e*, and thus *e*, with the letters called *a*, *o*, *u*, constitutes a single but a mixed vowel, in which their distinction from diphthongs consists.

I consider it superfluous to add much concerning diphthongs composed of these vowels, and which could be formed of them, as it is not my intention to write a grammar, but to examine the nature of letters. Yet this I will say of them in general, that, in speaking, they are formed from the successive but rather quicker pronunciation of two, and occasionally of three vowels, and will be rightly written if they are expressed by the vowels composing them. Most people write their diphthongs so badly that only one of the vowels composing them, or sometimes even none, is heard in

pronouncing them. I shall not undertake to discuss them more particularly, but leave it to those whom it may interest. For any one may easily test every diphthong by what I have said about vowels, as by the Lydian stone.

The semi-vowels belong to the second general class of letters; they are so called because they are formed from a sonorous breathing or voice, but which is much broken in its emission. Yet they can, like genuine vowels, be produced at pleasure. They are, as I have said, either nasals, or such as are pronounced through the passage by which the nostrils open into the cavity of the mouth; the voice, modulated by the cartilages of the larynx, is compelled to pass this road when it either comes against the closed lips, and rebounding thence, it is obliged to pass out through the nostrils, and is formed into *m*. Or, when the tip of the tongue is so applied to the

front palate and upper teeth that the voice cannot find a passage through the mouth; it then has to force a way through the nostrils, and is formed into *n*. Or, lastly, when the voice is so confined by the hinder part of the tongue being pressed to the palate that no exit remains except through the nostrils, and a sound is formed like *n* before *g*, or *k*, and *q* which has a peculiar character in no language that I am acquainted with, except, perhaps, the Hebrew *ain;* when however it only differs from other nasal sounds as much as *k* differs from *t* or *p*. If any one is desirous of trying these, let him, with his nose compressed between his fingers, attempt to pronounce either of the three, and he will find it impossible. The pronunciation of these nasal letters is alike in all languages, as is also that of the two following oral letters. There is one other observation, however, I must add which concerns the

n. If any word terminates in *n* and the following word begins with *b* or *p*, *g*, or *k*, *c*, *q*, then in pronouncing the *n* we unconsciously change it, for the sake of euphony, into *m*, if before *b* or *p*; but if *g* or *k* follows it, we pronounce the *n* of the preceding word as if it only constituted one syllable with them—a change which aids and facilitates deaf-mutes in speaking and reading.

I call those semi-vowels *orals* which are pronounced by an opening of the mouth, but not with a free and full channel, as the genuine vowels require; they are *l* and *r*. *L* is formed when the anterior part of the tongue stretched out is firmly pressed upon the palate and upper teeth, so that the voice can only escape through a small space by the sides of the tongue; for if you press the cheeks against the molar teeth, you prevent the voice from escaping, and will find it very difficult to pronounce this letter. *R* is

the voice fluctuating with great rapidity, and is formed while the more movable part of the tongue strikes against the palate several times during the wink of the eye and rebounds again, the thicker part of the tongue remaining fixed; for thus the voice, formed in the larynx, advances and retreats in its pronunciation by a sort of oscillatory movement, and acts by leaps. Hence those who have the anterior part of the tongue so thick and heavy that when they wish to move it in this way, it overbalances the hinder part, will form the letter *r* in the throat, whether they have the use of hearing, or whether they are deaf, and will never pronounce it correctly.

The number is at last closed by the consonants, which are formed by an unsounding breathing; whose whole strength and peculiar difference consist in their various modification. Some of them, as the *z*, *v*, and *j* of the French, *th* of the English, &c.,

are not quite unworthy of the name of semi-vowels, for which reason I have often thought of giving them this rank. But wishing to avoid the hateful name of an innovator, and not desirous of waging war with the consonants by extending the limits of the semi-vowels, I have changed nothing. However, the letters now described have a certain rough sound common to them which seems to me more of this nature than that soft, light sound with which they are united; wherefore I shall name them after their more powerful part.

Consonants are in general either single or double, and all are pronounced through the mouth, not any through the nose. The simple consonants are either sibilants, which may be lengthened or shortened at will, like vowels and semi-vowels; or explosives, which are uttered, as it were, by a sudden and single effort. Both these, again, I have divided into two classes, viz., those which

are simply such, and those which have a somewhat light sound accompanying them.

The sibilants, simply so called, are formed from the breath, compressed in some part of the mouth and blown out through a narrow aperture, as are *h*, *ch*, *s*, *sch* which is the same as the Hebrew letter *shin*, and *f* or *ph*. *H* is the most simple of all the consonants, for it does not differ from the breath which we commonly respire through the open mouth, except that it is pressed rather more closely on the opening of the larynx, and is the common material of the following letters. If the jaws, with the aid of the hinder part of the tongue being raised into a lump, be so closed that a breath comes out with a hiss and an effort, from *h* is made *ch* of the Belgæ and Germans, the same as the Greek letter *chi*, and *g* of the Spaniards with a hollow sound. The French, Italians, and English have this consonant in their

pronunciation, but not in their alphabet. Hence if they learn the German or the Belgic language, they always stumble at this obstacle. But if the middle part of the tongue is gently raised, and its fore part is so applied to the teeth that the breath can only pass out by a small opening through the interstices of the teeth, *s* is formed, a sound which is common to all nations; but if the passage for the breath is larger by the compression of the tongue, *s* is made more blunt, as the Germans sound *sch*, the French *ch*, and *g* when followed by *e*, *i*, or *y*, and the English *sh*: the Italians and Belgæ are without it. Lastly, *f*, or the foreign *ph*, is formed when the lower lip is so applied to the upper teeth, that the breath has to burst through the interstices of them. This letter is pronounced in the same manner in all languages. I have seen a boy who could not pronounce *f* on account of his lower lip being

so thin; but under my direction he pressed his upper lip on the lower teeth, and then he pronounced it easily.

The sibilant letters, which have a prolonged sound, are *g* of the Belgians chiefly at the beginning of words, *z* of the Belgæ and French, *j* of the French, and *v* of almost all nations. In fact these are the very letters which I have just called the simple sibilants; that is to say, *g* is *ch*; *z* is *s*; *j* is *sch*; and *v* is *f*, except that each, while it is pronounced, is accompanied by a gentle sound by which they are made softer than the others.

The other kind of consonants are explosives, and are nothing else but breath which, being collected in the back or middle or front part of the mouth, and kept from passing from the uvula through the nostrils, is suddenly emitted. They are either entirely mute and have no mixed sound, as *k*, *t*, *p*; or to lessen their

sharpness, they begin with a certain very light sound and are softly emitted, as the *g* of the French if followed by *a*, *o*, or *u*, the *d* common to Germans, English, and Italians, and, if I am not mistaken, the English *th*, and lastly *b*.

The first, namely, the silent explosive consonants, are formed in this manner. When the lower part of the tongue is firmly pressed to the palate, so that the breath, which we endeavour in the meantime to emit can get through neither the nose nor the mouth, being suddenly set at liberty, makes *k* or *q*, or *c* unless followed by *e* or *i*. If the same breath is collected round the teeth in the middle part of the mouth, when relaxed, it becomes *t;* but when the breath, after being collected in a cavity of the mouth through the compression of the lips, finds these barriers removed, the doors open and *p* is formed. These letters are pronounced in the same manner by

all nations, except that they are breathed out by some more fully than by others.

The latter are the same in number as the former, and are formed in the same way, with this slight difference, that when we wish to produce them, there is less effort in bringing them out, and we begin to pronounce them with a low, and, from the obstruction to their emission by the mouth and nose, a very short sound. Thus from *k* is made *g* as the French, Germans, &c. pronounce it, but the Belgæ are without it; from *t* is made *d*, but *p* is changed into *b*. I would here recommend the reader not to be too nice about these distinctions, if he should chance to have the instruction of a mute, for when the sound which accompanies the letters *g*, *d*, *b* ought not to be brought out either through the mouth or through the nostrils, but to hang about the jaws, it might easily happen that they would connect with them some one of the nasal

semi-vowels, and instead of *b* would say *mb*, instead of *d nd*, which would be worse than entirely omitting those sounds. It may suffice therefore to have shown the deaf and dumb pupil that this latter class of explosives only differs from the former in degree.

Of the double consonants which come next, I have hardly anything to say, and, might I speak as I feel, I should say that we could do very well without them, for they are not at all necessary. But as it has pleased the ancients to devise some letters, and as the moderns have added others which, although in fact simple, express two consonants, and though they are the very same as those which have been so far described, I am bound to resolve those which are now in use as double consonants into their simple ones. Some of these double consonants are composed of two mutes, as *x* from *k* and *s*, or *g* and *s*; *z* or *c* of the Germans when followed by *e* or *i* is made from *t* and *s*; with

which corresponds *z* and *t* of the Italians when followed by *i* pure; *c* before *e* or *i* of the Italians is the same as *ch* of the English, which is compounded of *t* and *sch*. The other double consonants are made from two of a soft sound, as *j* and *g* of the English and Italians before *e* or *i*, both which are compounded of *d* and *j* of the French. It is not necessary to discuss the formation of these, as I have already explained all the letters of which they consist.

I could easily augment this catalogue of letters, and show the method by which many others, quite different from those mentioned, might be formed by the organs of speech. But, of what use would it be? I wish the Hebrews, Greeks, and Romans had left their letters so described to us—if they had done so, there would not now be such disputes as there are concerning the proper pronunciation of them.

CHAPTER III.

In which the Method is explained by which I teach deaf mutes to speak, whether they are born so or made so by disease; and by which I correct defects of speech which are not incurable.

WHAT has already been said concerning letters and the artificial formation of them, may be sufficient for any one who has to teach the deaf to speak, and although I added nothing more, it would lead him on to what I promise in this chapter, as what has been said contains the fundamental principles of the whole art. But as readers may complain that I have only excited their curiosity, I will frankly explain to them what I have observed most necessary to be known, during the ten years that I have turned my attention to the instruction of some deaf-mutes,

whether born so or become so after birth, in order that I may the more effectually induce others to venture on a similar course, and have associates in carrying forward the work. If I seem obscure in some parts to any one reading this treatise, I trust that it will be imputed to himself rather than to me, for I boldly assert that there is as much certainty in my system as in mathematical demonstrations. During the whole time that I have practised it, I* have failed with but one, a girl whose intellect was dull, who did not learn it, and a worthless Jew whose father, I foresaw, would not even thank me for the pains which I had taken. Within the space of two months I have taught many mutes both to read and to pronounce a great number of words.

That the certainty of this system may be the more apparent, let any one consider that speech consists of words pronounced properly and in

* This sentence is a faulty translation of the original Latin text. It should read "I have failed with but one, a Jewish girl whose intellect was dull and therefore could not learn;

the right order; that words are composed of letters combined in different ways; that the nature and powers of letters consist in the voice and breath being variously modulated. As, therefore, every letter requires a peculiar adaptation of the vocal organs, and as the difference of one from another is observable to the eye, as has been shown in Chapter II., who will deny that mutes, who have their eyesight and are under the care of skilful teachers, can form the letters, and from the letters successively enunciated, form words, and from these in time produce speech?

First, what I require in teaching a deaf and dumb person is that he shall be of a quick and docile disposition, neither too young nor too advanced in life, but verging on youth, between eight and fifteen years old; and next, that all his organs of speech shall be perfect. If children are too young their minds

and an unworthy child whose father I foresaw would not even thank me for the pains I had taken." (R. W. R.)

are not retentive; they understand neither the use nor the importance of what is taught them; while those who are adults are either morose or too bashful; and those again who besides deafness have defective organs of speech, may comprehend those who address them, and may express themselves in writing, but can never learn to speak.

Having found a suitable pupil, my first care is to draw from him some sound, without which every effort is useless, and he will never speak with a clear voice. That by which the deaf themselves distinguish voice from a non-sounding or silent breathing (and this I acknowledge to have learnt from them) is, in fact, the great mystery of this art, and is, if it is right so to speak, the hearing of the deaf, or what is, at least, analogous to it. This is a tremulous motion and titillation which they feel in the throat while they utter sounds, as they often do, spontaneously.

For how should the deaf understand what I want when I open my mouth to pronounce any letter and command him to repeat it? He would not know whether I was simply opening my mouth or producing a noiseless breath, or whether I was emitting a clear sound for him to imitate. Hence I put his hand on my throat that he may feel its tremulous motion while I speak, then I tell him to put his hand on his own throat and imitate me. In this way I can turn his voice by his hand, as with a bridle, till the slightest alterations in it become observable. I am not discouraged even when the voice is hoarse and unmanageable at first, as it gradually becomes flexible and smooth by time and exercise. By this means I easily get rid of that chicken-cry, common to many deaf and dumb, yet so different from the genuine voice, and I produce in its place the human voice formed by the vibrations of the larynx.

When I have obtained a voice, which is generally done on the first attempt, I teach him the pronunciation of the vowels in a short time. I direct him to regulate the aperture of the mouth while he forms the voice in the larynx, as I have described above in reference to the formation of vowels. But that this may be more easily accomplished, I use a mirror; for, the different motions of the tongue, the jaws, and the lips, employed in the formation of vowels, can only be imitated by being seen. It must be practised for some time before a glass, and the habit of doing it acquired. We cannot move any of the muscles of the body with ease without much practice, as they daily experience who learn to dance, sing, and play on musical instruments. For this reason my pupil is exercised in the motions of the organs of speech before a looking-glass until the muscles become pliable.

From these observations I found the common belief to be false, that so soon as hearing is restored to deaf persons they will speak; for, although there exists the closest connexion between the organs of hearing and speech so that it is natural to imitate every sound we hear, yet it does not appear to me that we can do that at once; but rather that by frequent imitation of the tones we hear from others, and by hearing our own at the same time, we at length perceive the similarity between them and thus gradually learn to speak. Whether it is a deaf person, or one who can hear, who is learning to speak, it is like acquiring any other art, as I have shown in Chapter I., the organs must be rendered ductile and quick by constant exercise. None of us can learn to pronounce a foreign language properly without long practice.

I must here particularly remark that whenever I teach mutes to

pronounce a letter, I write it first; otherwise they cannot acquire that idea of it which they ought necessarily to have. But to give them every possible advantage in their exercises, I frequently require them to recite the letters which I have not pronounced but only written down, and again those which I have simply pronounced I make them imitate with both voice and pen. From this sort of practice they derive incredible advantage. The letters are more deeply fixed in the memory. They can repeat them in my absence, and, what is almost incredible, as soon as they have mastered all the letters of the alphabet, they read, and whatever I dictate to them they write correctly. I rarely, however, teach more than two or three letters in one day, lest their ideas should be confused.

The pronunciation of the vowels is a critical exercise; and as the slightest change in the position of

the tongue is liable to alter them, requires to be carefully attended to; for, the deaf, like those who have their hearing, do not pronounce them with exactly the same opening of the mouth. This has, therefore, to be tried by various methods, and since *e* and *i*, *o* and *u*, ö and ü are vowels very like one another, it sometimes happens that the pupil will at first pronounce one instead of the other. In this case I practise a little artifice. I do not blame him, but rather, as if it was the letter I want, praise him, and ask him to repeat the given sound a few times, and, at last, I write down for him the proper letter by which the sound is expressed, the former being blotted out. I can, thus, often obtain by chance and without trouble the vowel which I could not so easily obtain by any amount of labour. While he is learning the vowels, I often put his hand to my throat, and gently compress his nose with my

fingers that he may learn to produce through the mouth only a clear voice with a full sound.

When the vowels are learnt, I proceed to the semi-vowels, which are somewhat more difficult, especially the nasals, for the deaf and dumb never make sounds through the nose, unless taught to do so. Then I begin with *m*, as the most important, and easier than the rest, that the pupil may accustom himself to produce at least a sound through the nose. I direct him to compress his lips, and to give the sound with his hand pressed against his throat. He thus necessarily pronounces *m*, but not in the common way, *em*. The daughter of Mr. Kolard before she was placed under my care, was able to say *Papa*, for that is a little sound observable by the eye beyond most others, but her father acknowledged to me that he had tried a thousand times, in vain, to make her say *Mama*—which I ac-

complished in the prescribed manner in a minute.

What I have said in Chapter II. respecting the semi-vowels and consonants, I cannot sufficiently impress upon my reader, lest if he should have to teach a mute, he should instruct him to proncunce these letters with their vowels annexed, as *em*, *en*, *ka*, *ef*, *&c.*, for so the pupil would neither learn to read nor to speak correctly. The power and enunciation of the semi-vowels and consonants is not in the added vowel, but in its own peculiar sound and tone. In the word *man*, for instance, the enunciation of the letter *m* consists in the sound being produced through the nose ; it is not pronounced *emman*. If you were to do otherwise, and you wished your pupil, now taught his letters, to spell *Table* or *Hand*, you would hear nothing but *te*, *a*, *be*, *el*, *e*, or *h*, *a*, *en*, *de*, which is very discordant, and since you are not, at first, able to

converse with him, you would find it difficult to correct this fault. But, by my method, as soon as he knows his letters, he will begin to read, for reading is only the pronunciation of letters in succession. For example, in pronouncing the word *Mond* nothing is required but that the letters *m*, *o*, *n*, *d* be enunciated in this order without a break, and *mond* is spontaneously produced.

N.B. This method will be found of great utility in schools, especially when the languages are taught whose letters are expressed by entire words, as *alpha*, *omega*, *gimel*, double *u*, the Greek *i*, *&c.*, for much time is wasted, and the eagerness to learn is destroyed, before children can separate the initial letters of their words, and connect them in reading. But, although a sworn enemy and hater of vain boasting, I do glory in having taught boys to read who have never been at school or learnt the common method of

spelling in three or four hours, as an amusement, and while appearing to be doing something else. Yes, in a fortnight I taught the son of a tailor of Amsterdam, a deaf-mute, to read and commit to memory the Lord's Prayer. So that it must be a subject of surprise that this compendious method of teaching to read should have hitherto lain hid, or not been brought into general use.

The other two nasals, *n* common, and *n* as it is pronounced before *g* or *k* which is clearly different, have nothing peculiar, except that I show to the deaf in a mirror what is the peculiar position of the tongue requisite for the pronunciation of these letters, and I move one of their hands to my nose, by which they become sensible that the sounds are emitted through the nostrils, and the other to my throat that they may at the same time perceive the vibration of the larynx. Again I here recommend that the letter *n*, if followed by *b* or

p, be pronounced as *m*, and as *ng* if followed by *g*, *k*, or *q*, on account of its being generally more easy. This is not to be overlooked in mutes. The French almost always pronounce their *n* final as *ng*, which is worthy of observation to him who instructs a mute to speak French.

When I teach the letter *l* I direct the pupil to apply his tongue to the upper teeth, but to the incisors and canine only, and to that part of the palate nearest the teeth which are touched; then, that the sound may be emitted through the mouth, I make a sign to him with my hand; but lest he should pronounce *n* instead of *l*, which sometimes happens, when the tongue so stops the passage of the voice that it rushes through the nostrils, I close them gently with my fingers until they are accustomed to it, and compel the sound to issue through the mouth as *l*.

The letter *r* is almost the most difficult of all letters to pronounce,

and this is the only one which is not under my control; yet of all the mutes that I have instructed, there were only two who never pronounced *r* otherwise than in the jaws, and both these pupils had a large tongue and would not have pronounced it differently if they had had their hearing. While I am teaching this letter, I move the hand of the mute first to my throat, then to my mouth, by which he may perceive the leaping and the occasional abrupt emission of the voice. I also direct him to use the mirror, that he may observe the tremulous and vibratory motion of the tongue. But no one expects from a mute the true pronunciation of this letter at a first attempt. The attention should not be fatigued. The effort should be reserved for a future opportunity when the organs of speech have become more flexible from exercise.

The vowels and semi-vowels being now completed, I have accomplished

a considerable portion of my work, for the Consonants are taught with very little trouble. They are only breath accompanied with either none or only the slightest sound, either successively or suddenly produced by shutting or opening in a different manner the triple region of the mouth. They are all easily learnt by mutes by the hand alone being applied to the mouth.

H is the simplest of all. It is nothing but air which is breathed out thicker and more agitated than is done in the act of respiration.

Ch is sharper than *h*, which I teach while I show the deaf the swelling of the tongue in the glass, and I give the voice a stroke as it passes out. So it is with *s*, *sch*, or *ch* of the French and *sh* of the English, as also *f* or *ph*, that nothing is more easy, and from what has gone before they are taught with so little labour that I never remember to have spent a quarter of an hour upon these letters.

There are so many other letters analogous to these, and which are almost the same with them, as *g* of the Belgæ with *s*, *j* of the French with *sch*, and *v* with *f* or *ph*. The only difference is that these latter are usually pronounced with a slight whistle, which the mutes, if once they can perceive it with their hand applied to my throat, easily imitate. But it matters very little whether they add it or not as long as they pronounce those letters somewhat softer than the former.

I could teach the explosive consonants to a mute, even if he were blind, for if I allowed him to feel an explosive breath, he would necessarily pronounce one of them. Therefore I simply direct my pupil to look at my mouth and tongue, and with his hand placed on my throat, I pronounce either *k*, or *t*, or *p*, and I bid him do the same; scarcely any one, even on the first attempt, is unsuccessful. With these

three letters, there are also the same number of analogous ones; with *k* corresponds *g* as it is pronounced by the French, Germans, &c.; with *t* corresponds *d*, and in some measure *th* of the English; with *p* also *b*. But it will be sufficient to teach the mute to pronounce the latter letters softer and with less emphasis than the former.

I have nothing to add respecting the double consonants except that I do not trouble the deaf and dumb with them until they have become familiar with all the simple letters and can both speak and combine them correctly. When they can say *ks*, I show them the letter *x* and explain that its sound is the same. So also of the rest. For *z* of the Germans, and *c* before *e* or *i* is *ts*; *j* of the English is *d* and *j* of the French; *ch* of the English is *t* and *sh*, *&c.*

In this way I have instructed my deaf and dumb pupils to pronounce

each letter singly; but as they will not yet be able to speak, I must subjoin some observations, not unworthy of attention, concerning these letters and the proper mode of putting them together in conversation and in reading.

At first I teach my pupil to pronounce almost all the semi-vowels and consonants with the mouth rather open, lest the lips or teeth might obstruct the sound, and conceal the motion of the tongue. But, afterwards, I practise him continually in pronouncing these semi-vowels, *n*, *ng*, *l*, *r*, and also the following consonants, *h*, *g*, *ch*, *s*, *sch*, *z*, *k*, *d*, *t* with the needful opening of the mouth. Otherwise he would not be able to join certain vowels and consonants without a particular pause and cacophonous noise. He would say *wiel* for *wil*, *tien* for *tin*, *&c.*, when all the elegance of speaking and reading require that the vowels be closely pronounced

with the other letters, and no other sounds introduced. In general the winter is more favorable for giving instruction to the deaf and dumb, because they can see the breath coming out from the mouth and nostrils in the act of pronunciation.

As soon as I have taught a mute to pronounce the letters above enumerated separately, I teach him to speak two or three of the simplest and most important in such a way that they combine well and admit of no pause between them, as *ab*, *am*, *af*, *ba*, *fa*, *ef*, *ast*, *tam*, *mof*, *&c.*, by which he gets accustomed to pronounce letters successively; I then gradually accustom him to the more difficult combinations, by mixing vowels, semi-vowels, and consonants in different ways, and by placing before him first one and then another, and so he will, if attentive, with little trouble and time, learn to read. In order to fix the images of the words more deeply in his memory, I very

often direct him to form words out of the letters I have pronounced one by one and which he has repeated after me, and immediately commit them to paper. By this method he learns not only how to make the letters, but also to write correctly all words of which he has any knowledge. On this system I taught a youth, at Haarlem, of rustic simplicity, in one month to pronounce the letters correctly, and to read and write a little.

I am particularly careful when one consonant follows another, as *ps*, *ts*, *kt*, *gd*, *tf*, *&c.*, or a semi-vowel, as *ls*, *lk*, *lm*, *md*, *mf*, *ms*, *&c.*, that the pupil joins them close together so as not to let any *i* or *e* be heard between them in their pronunciation, which frequently happens unless care is taken. But I easily avoid that, if as I have recommended, I teach the pupil to pronounce the semi-vowels and consonants with the needful opening of the mouth. These three

combinations were, for a long time, difficult to manage, *pm* or *bm*, *tn* or *dn*, *tl* or *dl*. Instead of them I got *pem*, *ten*, *tel* until it struck me that these explosives were not exactly pronounced, but that it was sufficient to attempt a soft pronunciation of them, when the difficulty soon vanished.

It frequently happens at the beginning that the deaf and dumb pupil does not pronounce the vowels which are connected with semivowels and consonants with sufficient rapidity; he prolongs them beyond what is proper to the great detriment of elegant reading; but I correct this fault, by practising him in those combinations of vowels with semivowels and consonants which are most easily put together, and which I can regulate with my fingers. For example, in these syllables, *kam*, *stem*, *stof*, *tip*, *tub*, the vowels *a*, *e*, *i*, *o*, *u* ought to be pronounced very rapidly; but lest the pupil should say *kaam*, *steem*, *stoof*, *tiip*, *tuub*,

as soon as I hear the vowel, I close his lips with my fingers, and, by this method, he learns to shorten the vowels as much as he pleases not only in these words but in all others.

When this exercise has been continued for some time, I give the pupil a book to read, which I direct him to close as soon as he has read a line of it, and, looking at me, to repeat all the words after me. This is an amazing help to him, for he is thus accustomed to imitate by sight alone the words just read, before the idea of them is obliterated. In the same way we hear distinctly what is read while the book is before our eyes, or we remember it, which, without the help of the book, we should not understand, either from being too far off the reader or from its obscurity. But I do not wish the deaf and dumb to be wearied with this exercise, which is sufficiently tiresome until they are more ad-

vanced. They must be gently and judiciously treated.

The great difficulty seems to be this: 1st, that some letters, such as *e* and *i*, *o* and *u*, ö and ü are enunciated with almost the same opening of the mouth; 2ndly, that others, such as the nasals *m*, *n*, *ng*, together with the explosives analogous to them, *p*, *t*, *k*, are enunciated with exactly the same opening of the mouth; and 3rdly, that others, such as *ch*, *k*, are so hidden in the jaws that mutes are necessarily quite embarrassed to discover how to pronounce them. But this difficulty is not of great moment. For, besides that practice and the deaf themselves, both those who speak and those who understand other people, are on my side, I say in relation to the first class of letters, that a very exact criterion of sounds cannot be expected from mutes until they have become familiar with a sufficient supply of words; for, then, they will

not hesitate more than the experienced reader who reads a hastily written epistle, and in it frequently meets with letters differing as little from each other, as *m* and *n*, *r* and *n*, *a* and *o*, *&c.*, which are often formed so nearly alike that he can only distinguish them from their connexion with the preceding and following letters. In relation to the second class of letters I remark that the deaf and dumb should be accustomed to look at the throat of the person who is speaking to them, for the explosives are hardly ever pronounced without some elevation of the larynx, and are thus distinguishable from the nasals which are analogous to them. The third class scarcely need an observation, for *k* is explosive, *ch* is generally open to the eyes. But in order to assist the natural defect of the deaf and dumb we should speak to them, at first, slowly and distinctly, with the head inclined as little as possible. Not,

however, as some do, who to make themselves better understood stretch open their mouths in a strange manner and continually nod their head while speaking, thus trying to give greater emphasis to the voice, which is quite useless to the deaf.

Some will object that mutes, so taught, might learn to speak, but would, perhaps, be able to understand no one but myself. This objection seems to have some weight; but it is to be remembered that many pronounce some letters with an incorrectness equal to the careless manner in which they form their characters. It is then with one who learns to speak, as with him who is taught to read the caligraphy of others, and the mute whose ears are in his eyes understands the words of others as it were by reading. The former begins with reading scarcely any thing but what is written by his Teacher, then by his companions, till, eventually, he can read any

thing however badly and imperfectly it is written. It is not surprising then that those whom I instruct can, at first, understand me better than others (especially as I pronounce the letters in their full extent, and not shortened as others do), then their companions and friends, and, last of all, any body whatever.

When my pupil, a born mute, is able to read and to imitate me a little in speaking, I treat him as a sheet of white paper, or as a young child. First, I teach him the names of the most obvious things, substantives as well as adjectives, as also the more necessary verbs and adverbs, with some conjunctions, then declensions and conjugations, and, not till last, the peculiar constructions of the language, which I explain to him by the most amusing and useful examples relating to his necessary wants, reverence to God and to his parents, honesty, kindness of manners, &c. In prosecuting this

course I have derived the greatest assistance from the five movable circular diagrams—a rich treasure of the whole German language—which are in Schwenter's "Mathematical Amusements." These I have enlarged and adapted to the Belgic idiom. From these not only all possible combinations of vowels, semi-vowels, and consonants, but all terminations of German words as also derivations and compounds, may be quickly and agreeably acquired. Those diagrams are made of thick paper—increasing in size from the first to the fifth, and the margins, by which each exceeds the preceding one, are alone written upon, and so they are fitted to one another, that they may revolve round a common centre. The first contains all the prepositions and other particles with which nouns and verbs are compounded, as *ab*, *an*, *in*, *mit*, *be*, *ge*, *ver*, *&c.* The second contains the initial letters, as *s*, *st*, *str*, *fr*, *fl*,

kn, kl, sch, schr, &c. The third enumerates all the vowels and consonants which, with the preceding, make a syllable or part of one. The fourth gives the final letters with which German monosyllables terminate, as *rt, rm, rs, rf, rsch, rt, rn, rk, mt, nt, st, lm, &c.* The fifth has all the terminations of German verbs, as *en, er, in, ung, heit, sam, &c.* So that by turning round these diagrams more than a hundred words, derivatives or compounds, may be obtained from one root, which is a compendious mode of acquiring any language.

I proceed now to perform my other promise and to redeem my pledge of amending the defects of speech. The number of these is so great that it would be tedious to enumerate them, and sometimes the defect is beyond the reach of art. I shall, therefore, only notice the most important, and such as come more immediately within my province. They are

either general, as affecting the whole speech, or they are particular, as affecting the pronunciation of one or two letters; both may happen with or without a marked defect in the organs of speech.

The general defects of speech with imperfections in the organs, are either in the voice itself, as aphony, and various other faults in the quantity, quality, and manner of speaking, or they have a higher origin as being the result of idiotcy, or paralysis of the tongue and the rest of the organs; or arising from an absence of the power of moving on account of a rude and unformed mass or the connexion of parts which ought to move freely with other parts. For such defects as these it must be evident that there is nothing to be expected from this science. The treatment in such cases must be left to physicians and surgeons.

The general defects of speech without defect of the organs come

within my province, and are chiefly two. One is a certain Hottentotism; the other is stammering. The former has been already described in the first chapter of this Dissertation, and is of rare occurrence. It consists in being able to distinguish and understand the sounds of others but not being able so to elaborate sounds through the organs of speech as to be intelligible to others. Such was the defect of a daughter of John Veer, sheriff of Haarlem, who was only able to pronounce the letter *t*, and all her conversation was a repetition of *t*. Yet after instructing her in the method which I employ with the deaf and dumb, I taught her to speak clearly and distinctly all the letters, and in the course of three months so overcame a defect which was deemed incurable that not a vestige of it remained, and from that time this amiable girl spoke intelligibly.

Stammering is almost a perpetual blundering of utterance, which arises

as much as any thing from a bad habit. It consists, for the most part, in so labored and anxious a repetition of the explosive letters that the face of the stammerer appears livid and suffused with blood from the constant struggle to speak, and the consequent diminution of inhaled air. I recommend to persons so affected to read much with a distinct and loud voice, to relate the narratives lately read to a friend, to commit something to memory daily, and often to repeat it, and never to speak but with slowness and premeditation. In the meantime I frequently practise them in the pronunciation of the explosive letters, combined in all possible ways, *tak*, *tek*, *tik*, *pek*, *pik*, *kuyt*, *tuyt*, *&c.* In this manner I cure stammering.

The particular defects of speech consist either in an incorrect pronunciation of one, two, or more letters, or in no pronunciation of them at all. They have their origin

either in a malformation of some organ, or in habit. The organs which may be vitiated are either passive or active. The former include the passages of the mouth and nose which afford a transit to the voice and breath, and make the pronunciation incorrect if either too wide or too narrow. The passage of the mouth is rendered defective either by the looseness of the lower jaw, or by its immobility from some other cause. In either case the speech cannot be corrected without the removal of the cause. The nasal passage is sometimes too wide, so that the voice and breath chiefly fly off through the nostrils, whence, besides a general defect of speech and a marked vitiation of the voice, this particular evil is induced that none of those letters which ought to be forced out through the mouth, as *k*, *t*, *p*, *&c.*, can be pronounced. To remove this defect is scarcely possible otherwise than by so stopping up the

passage with a thin plate of metal, that the voice and breath may be compelled to pass more than usual through the mouth. If it is only a slight defect, the letters *k*, *t*, *p*, *&c.*, may be pronounced by compressing or obstructing the nostrils, or the lower part of the tongue may be accustomed to close the passage. A bookseller of this city has a daughter whose nasal passage is open down to the middle of the palate, and who, from this cause, could never pronounce the letters described. When I compressed her nostrils with my fingers she pronounced them at once.

Whenever this passage is not sufficiently open, or is completely stopped, so that the patient finds it difficult or impossible to pronounce the nasal letters *m*, *n*, *ng*, no trouble should be spared to remove the impediment, otherwise, all labour will be useless. They who have a severe cold and the nostrils stopped with a thick mucus cannot pronounce

those letters without great difficulty, and are commonly said to speak through the nose; but this is a mistake, for they do not speak sufficiently through the nose.

The active organs of speech most liable to defects are the tongue, the uvula or the throat, the jaws with the teeth and lips. The tongue may be defective either in quantity, quality, or motion, sometimes, indeed, in all together. It is oftener too large than too small, unless a part of it is cut off, or eaten away with an ulcer. It is sometimes so large that the whole cavity of the mouth is filled with it, and then the speech is signally injured. In this case the tongue touches almost every part of the mouth in speaking, and some letters are either not pronounced at all, or are miserably distorted. Under these circumstances the tongue so far as its size allows should be led as it were by the hand before a looking-glass. I had some time ago a

Danish gentleman in my house who, besides pronouncing many letters incorrectly from having too large a tongue, could never by any effort get out the letter *k*, he always said *t* instead. I placed my two fingers on his tongue firmly and told him to pronounce *ka*. He, according to his habit wishing to say *ta*, tried without being able to put his tongue to his teeth, and then necessarily, with the greatest delight pronounced *ka*. The same nobleman pronounced the letter *l* very badly in the hinder part of the mouth, though it ought to be formed about the teeth. In a short time I accustomed him, by applying the tongue to the teeth, to pronounce it correctly enough. With this defect it is hardly possible to do any good with the letter *r*.

The quality of the tongue is changed when its moving fibres become weakened. A sluggishness then discovers itself which chiefly impairs the pronunciation of *l* and *r*. In

some this defect is corrected by age, for the natural heat being increased the tone of the fibres with the whole nervous system is strengthened. In others it is hereditary, and is not to be thought lightly of. Yet I have fortunately overcome it in many, and very lately in the son and daughter of a merchant of Rotterdam, who could not distinctly pronounce the letters *r* and *l*, but substituted in their place, wherever they occurred, the letter *i*. Now, however, after I have pointed out to them the proper position of the tongue, they can both readily and correctly pronounce *l*, but the *r* still sticks in the throat, as is vulgarly said.

The tongue is defective in its motion either when the whole lower and lateral part of it lies immovable, which I once saw in a girl at the house of his Excellency Mr. Ruysch, (such a defect can hardly ever be cured by art,) or when the anterior part of the tongue cleaves to the

bridle or tongue-string, as it is not inaptly termed, which is too much contracted or too short, so that its movements towards the upper teeth are much obstructed, and the pronunciation of the letters *r* and *l* is either difficult or impossible. This defect is easily corrected by cutting the tongue-string, and by frequent practice afterwards. If the tongue is defective in having no curb or tongue-string the *l* alone is impaired, for when the tongue is drawn upwards and at the same time backwards to pronounce the letter *l*, it has nothing to restrain it and runs too low down; then, by trying to recover itself suddenly, it gives an obscure pronunciation of *r* instead of *l*. This defect is rare, and is readily overcome if the individual will accustom himself to move the tongue upwards and at the same time towards the front while he pronounces *l*.

The uvula may either be wanting, to the irreparable loss of speech, or

be too large. The former defect not only injures the voice, as those persons experience who have had that part destroyed by some ulcer, but also impairs the pronunciation of the explosive letters, on account of the breath not being so restrained in the cavity of the mouth as to prevent it from finding its way out of the nasal passage, which ought in the meantime to be closed by the uvula and membranes of the palate. The latter does not so signally impair the speech, yet it generally gives a bluntness to the nasal letters; but this is easily corrected by removing a portion of the uvula.

I have already treated of the defects of the lower jaw when I spoke of the defective opening of the mouth. The upper jaw is sometimes impaired by disease, in which case the voice and speech invariably suffer. I will add, therefore, a few words respecting the teeth and lips.

The speech is injured when the teeth are either lost, or are so close together that there are no interstices. In both cases *s* and *f* principally are badly pronounced, and in the former the vowels *e* and *i* also, which are as it were sharpened round the teeth. The introduction of artificial teeth will cure this defect; and filing between the canine and incisor teeth when they are too close together, will enable the breath freely to pass between the interstices in the pronunciation of *s* and *f*, *z* and *v*.

Lastly, the speech is impaired by hare-lip and by wounds or ulcers which have injured the lips; for the letters *m*, *b*, *p*, *f*, *v* cannot be formed; and others, as *o*, *u*, ö, ü are almost destroyed. If the defect arises from a hare-lip, it may be cured, but much practice will be necessary for the requisite formation of the labial letters until the habit is established. But if both lips are affected, it is not possible to apply a remedy, unless

the individual can supply artificially the defect of his lips with his fingers. If one only is affected, he may supply the defect by the use of the other, by assiduous practice. I have seen a boy whose lower lip was so small and whose chin was so drawn that he could not form the letter *f*. At my request he pressed his upper lip upon the lower teeth, and pronounced *f* at the first attempt.

The defects of speech arising out of bad habits are almost countless, but they want names and cannot be defined except *viva voce;* they consist in an incorrect pronunciation of some letter or other which is either too smooth or too harsh, too full or too sharp, too broad or too contracted. Hence I leave these to any one to be treated according to the principles which I have already developed in this Dissertation. They who give instruction in foreign languages may properly avail themselves of these suggestions.

There is also one other defect, common to some public speakers, who, however they shout, cannot make themselves understood by one in a hundred. The reason is this, that intent only upon speaking in a loud voice, they bury, as it were, their consonants under the vowels, and waste their voice by making it a third or a fourth too sharp, and use all the air in their lungs before they have completed their sentence. They thus form the last words imperfectly, as if drawing in the breath, and, as is well said by the common people, swallow them. But they may correct this fault if they wish by restraining their voice, not using it so impetuously; and thus they will equally consult the benefit of themselves and of their hearers.

Whatever has been already remarked respecting the voice and speech, I am desirous should be applied only to our daily and ordinary utterance which is made by

breathing. For there is another mode of forming it by drawing in the breath, which is a faculty not given to every one, and which has sometimes excited my wonder in ventriloquists. I once heard an old woman at Amsterdam speak in both ways, answering her own questions, and I could have sworn she was talking with her husband two paces at least away from her. The voice which was absorbed by being drawn inwards appeared to come from afar. This old woman might easily have passed for a prophetess.

These observations have been principally intended for the service of the deaf and dumb and will be useful to them beyond all others, but many points have been touched upon in this treatise which would be generally serviceable if brought into practice.

1. They who hear with such difficulty that they can neither fre-

quent the house of prayer, nor the society of their friends without feeling great inconvenience, may so exercise themselves before a mirror that, in spite of their deafness, they may learn to hear with their eyes and derive the greatest pleasure from the exercise.

2. Boys under a skilful teacher, may not only learn to read whatever language they please by this method in an incredibly short time, but may also learn to pronounce every language which they acquire, if, while learning, they accustom themselves to attend to the formation of each letter.

3. They will afterwards hear with their eyes as well as their ears, and by this means they will frequently obtain a great advantage; for we are often much concerned by what is done or said secretly of us, and by what is clandestinely plotted against us or other people, which, though we were present might easily

be concealed by muttering with a low voice; happy should we be if, by detecting with the eyes what was denied to the ears, we could escape danger, and find out in this way the insidious secrets of others.

4. They whose speech is greatly impaired may not only correct their defects by submitting themselves to the methods which I have pointed out, but may also become their own teachers and thoroughly get rid of their defects unless the organs are completely vitiated.

5. The genuine pronunciation of every language may be preserved from destruction by this method, and even if it is a dead language, it may be restored by a little trouble if the letters be written in the manner described.

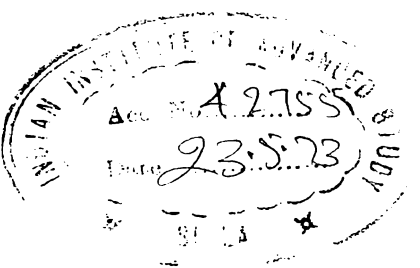
As, therefore, according to the line of Horace,

"Omne ferat punctum, qui miscuit utile dulci,"

I shall seem to some perhaps not to have lived in vain, let them who

regard with interest this wonderful artificial system of speaking, and who perceive, not without pleasure, the truth of my observations, employ them, should occasion offer, for the benefit of themselves and others, and they will most cheerfully join me in offering praise to God their Creator, for which purpose Speech was chiefly given.

THE END.



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