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Contributors

Cull, Richard.
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OBSERVATIONS

ON

IMPEDIMENTS OF SPEECH, ETC.

SECOND EDITION.

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OBSERVATIONS

ON

IMPEDIMENTS OF SPEECH;

WITH

SOME REMARKS

ON THEIR

SUCCESSFUL TREATMENT.

IN A LETTER ADDRESSED TO

T. J. PETTIGREW, Esq. F.R.S. F.A.S. F.L.S.

PRESIDENT OF THE WESTMINSTER MEDICAL SOCIETY,

ETC. ETC.

By RICHARD CULL.

SECOND EDITION, REVISED AND ENLARGED.

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A LETTER, &c.

DEAR SIR,

AMONG the many maladies to which humanity is liable, the derangements of the functions of voice and speech are certainly not the least afflicting.

Indeed, the causes of impediments of voice and speech appear never to have received that investigation from professional men, which their importance and frequency demand; and, perhaps, this may arise from the well known fact, that much assiduous superintendence being requisite for their removal, the time which would thus be devoted in giving that attention, and which alone is capable of overcoming these defects, could ill be spared by medical practitioners.

Impediments of speech have existed in all ages; and though some persons have been so fortunate as to throw them off by their own efforts, they have not been able to explain to

us by what means this has been accomplished. It is an historical fact that Demosthenes had an impediment in his speech, which he corrected by pronouncing orations, with pebbles in his mouth, by the sea shore. A friend of mine, who laboured under an impediment of speech until the completion of his eighteenth year, when resolving to get rid of it, was at length completely successful — is now a public lecturer, and one of the most eloquent men in this country, — yet he, too, is unable to explain how he effected its removal.

It is well known to the profession, that many persons, with impediments of speech, can sing, and even read smooth verse, provided they read it in a drawling manner. This point is well illustrated by the following fact: — A plasterer, who had a very distressing stutter — indeed to so great a degree, that he frequently was thrown out of employment in consequence — informed me, that at such idle times he contrived to get money by wagers in public-houses, that he could sing a song of several verses without a single recurrence of his defect. To the astonishment of all who heard him, he would accomplish this, while he could scarcely utter a word in common speech without its obtrusion.

The relief which empirics have casually afforded, and the cases of individuals throwing off stuttering by their own efforts, are useful in shewing the possibility of cure; and that, if the subject were properly investigated, the permanent removal of every case of impediment, from whatever cause arising, would be rendered extremely probable.

Allow me, then, to preface my observations on the nature, causes, and remedies of stammering, and other impediments of speech, by a few remarks on the structure and functions of those parts which form the instruments of voice and speech.

At the root of the tongue lies a small bone, which, from its resemblance to the Greek *υ* (u-psilon), is called the hyoid, or u-like bone: to this bone is attached a long cartilaginous tube, which extends to the lungs, forming a channel for the conveyance of the air to and from them, constituting breathing.

This tube is called the trachea, or windpipe. The part in immediate connection with the hyoid bone is named the larynx: it is generally described as a sort of box placed on the top of the windpipe, and consists of five cartilages; namely, the thyroid, or shield-shaped cartilage, which projects in the front of the neck, and is

well known as the *pomum Adami*, or "Adam's apple;" the two arytenoid, or funnel-shaped cartilages, situated behind these, and forming the glottis, or immediate opening from the mouth to the larynx; the cricoid, or ring-like cartilage, serving at once as a base and connecting piece to join the larynx and trachea together; and the epiglottis, shaped like an artichoke leaf, the office of which is to cover the glottis, and prevent food, or any other matter, from entering it. These cartilages form the larynx, and are severally provided with muscles for its contraction and dilatation. Its interior is lined by a very sensible vascular and mucous membrane, which is a continuation of that of the mouth.

"The voice," says Richerand, "is an appreciable sound, resulting from the vibrations which the air expelled from the lungs meets with in passing through the glottis. * * * * All animals furnished with a pulmonary organ have a voice." Without entering into an investigation of sound, it may here be stated as a well known fact, that air rushing from the human lungs through the opening at the top of the windpipe, causes the elastic lips of that organ to vibrate, and to excite tremblings in the air which affect the ear with the sensation

called sound. From various experiments in the science of acoustics, we are certain that the presence of air is essential to sound; and it has been stated above, that the air striking with force upon an elastic body causes it to vibrate, and to excite tremblings or undulations in the contiguous atmosphere, which, communicated to the ear, produces that peculiar sensation denominated sound.

Various explanations have been given of the manner in which the air is rendered sonorous by the larynx. Galen supposed it to result from the alteration of the calibre of the glottis; Dodart revived the idea, and compared it to a flute; while Ferrein explained it by a comparison to a violin, supposing all the variations of sound to result from different degrees of tension of the *chordæ vocales.* Richerand unites the two latter explanations, and thus supposes the larynx to act as a wind and a stringed musical instrument at the same time. It has, again, been compared to a drum, and also to the Æolian lyre. It is very probable, however, that the hypothesis of Richerand is the true one; but a sufficient number of precise observations have not yet been made to determine the question.

The voice can be produced either during

inspiration or expiration ; but it is formed by ordinary speakers during expiration. Ventriloquists at times speak during inspiration, in order to modify the sound, which is not so loud, and has a peculiar character, very different from the voice produced during the expiration of the breath.

The larynx, however, is the sole instrument of the voice, the lungs being receptacles, and the trachea a passage for the air to and from that organ. But if we speak during inspiration, and not during expiration, as in the ordinary manner, the lungs are no longer the receptacles for air — they do not answer the purpose of the bellows to an organ, nor does the trachea serve as a passage from these receptacles to the organ of voice; for, in this case, although the larynx is still the sole organ of voice, the receptacle is the external world, and the mouth is the air-passage. Thus the whole arrangement is reversed, and cold air instead of warm is used, which is thrown into the larynx at the top instead of the bottom. If we pronounce the words *fan*cy, *ab*solute, *ci*ty, *hear*ken, we find a sort of percussion on the first syllable of each : this quality of voice is also felt on the second syllable of dis*co*ver, re*ply*, pre*serve*, de*stroy* ; on the third of

anti*mo*nial, appro*ba*tion, multi*fa*rious. This particular characteristic which affects certain syllables, is called by grammarians *accent*, when they treat of accent; and it is also by the same individuals termed *emphasis*, when they speak of emphasis. This quality is given to syllables by a certain action of the larynx, which it is impossible to duplicate without a pause between. There cannot be two syllables sounded during this action, although several may be sounded during its re-action, as in the following illustration from Burns,—

"The *small* birds re*joice* in the *green* leaves re*turn*ing:"

where the syllables in italics are characterized by this peculiar force, and spoken under this action of the larynx; the other syllables being pronounced during its re-action. It may likewise be observed, that if a word, whose first syllable is said to be accented, be spoken, the voice is formed without any sensible preparatory motion of the larynx, as in *fan*cy, *ci*ty, *hear*ken; but in order to pronounce words where the accent is on the second or third syllable, there is a certain preparation of the larynx before the voice is raised, and this is

its action being performed mutely, in order to produce voice during its re-action, as in the words re*ply*, appro*ba*tion, &c. where those syllables which are called unaccented or unemphatic are to be pronounced before those named accented or emphatic. To Mr. Thelwall are we indebted for the analysis and application to elocution of this quality of the voice, and indeed for its discovery. It would tend much to distinctness, if all who treat of language would adopt Mr. Joshua Steele's terms for these peculiarities of syllables, and call what is usually denominated the accented syllable, the *heavy* poise, corresponding to the thesis of the Greeks; and the unaccented syllables, the *light* poise, corresponding to the arsis of the Greeks: the terms "*pulsation*" and "*remission*" have been suggested.

The voice is capable of producing low or high notes in the musical scale, which is effected, according to Dodart, by the change in the diameter of the glottis, the aperture being large for grave notes, and small for acute ones; while Ferrein considers the pitch to depend upon the tension of the ligaments which form the sides of the glottis; that, if these be very tight, acute notes are produced, which are rendered grave according

to their degree of relaxation. Now, admitting Richerand's hypothesis to be correct, it will depend on the conjoined actions of change of diameter of the glottis, and the tension of its sides; but, in the production of a different note of the musical scale, we find the whole larynx changes its place in the throat. Thus, for acute sounds it is carried upwards and forwards. To produce the most acute sounds, the head is thrown back, which allows a greater extent for its elevation, as may be observed in singers: this extent of motion is about one inch for two octaves. The fact may be proved by either performing the experiment before a looking-glass, or by placing a finger on the larynx and then sounding an acute note, when the elevation will be found to be in proportion to the acuteness.

"The modifications of the voice," says Richerand, "depend not only on the varied sizes of the openings of the glottis, and of the tension of its ligaments, but further on the degree of length of the trachea. The singer, who runs down the whole scale of sounds, from highest to lowest, visibly shortens the neck and trachea, whilst in ascending he stretches them out." The alteration of the

length of the neck does not warrant the conclusion, that the pitch of the note in the gamut results from the length of the trachea. We know that the note of any tube depends on its length, as in the Pandean pipe, where the longest produces the lowest, and the shortest the highest tones of the series: so with all other musical wind instruments. Now the very opposite effect takes place with regard to the trachea; for, when it is lengthened, acute sounds are the result, and when shortened the reverse: hence, then, here is either an exception to a general law, or the prolongation of the trachea does not effect the change in the note. But the trachea is a mere channel from the lungs to the vocal organ; it is below the sounding part, and therefore cannot affect the voice any more than increasing the head of a flageolet will alter its tone. We find the increase or decrease of the length of the perforated tube of the flageolet affects it, for the note of the instrument is gravest when all the holes are stopped, and rises as the fingers are removed, the vibrating column of air being made shorter by each removal, and in the knowledge of the holes to be closed to produce certain notes consists the art of the performer. We find the rising of the larynx shortens the

distance between it and the lips, and the falling increases that distance; but we also see, that when an individual is running down the scale, besides the falling of the larynx, he protrudes his lips from his teeth until he can go no further: this produces elongation of the distance between the larynx and the lips; and as the opposite effect takes place in running up the gamut, we should conclude that it is this distance which is the vocal tube, and whose increased length is necessary for the production of grave notes, rather than it depends on the trachea. Here, then, is no exception to a law of sound; but, on the contrary, a fact to show that the pitch of the voice, like all wind instruments, depends on the length of the vibrating column of air.

It is generally known that the voice is altered by the density of the air: the vibrations depend on its elasticity, which is varied by the density. Thus on high mountains, where the atmosphere is attenuated, the voice becomes subdued to a whisper. In caverns and deep mines, the contrary effect takes place. Any air heavier than ordinary would give rise to the same result; but it destroys life. Compressed air, as that of a diving-bell, however, will produce the effect.

The voice is also affected by the passions and feelings of the mind; as joy, anger, fear, love, &c.

When the cerebellum becomes capable of exercising its function, a change takes place in the whole system, and during this period there is a great irregularity of voice; power over the tones seems to be entirely lost, as it passes uncontrolled from grave to acute, loud to soft, harsh to shrill, and so on. This arises from the change affecting some parts more than others, and so destroying the balance between them; but, ultimately, when it has once taken place, the voice becomes fuller, deeper, and more sonorous:—this being what is called the *breaking* and *setting* of the voice.

This brief survey of the structure and functions of the parts requisite for voice, will be sufficient for my present purpose. It is not necessary to enter minutely into the subject; I shall, therefore, dear Sir, pass over the inquiry into secondary vibrations, and the consideration of the other modifications it receives, and at once draw your attention to the parts essential to speech—the enunciative organs; which consist of those portions and members of the mouth, by the motions, positions, and contact of which, the elementary

character of literal sound is added to the impulse of voice. These are the ordinary organs of speech, which so far modify the stream of voice as to form those specific and contra-distinct elements, the articulation or joining of which form syllables and words, of which orations are composed.

The enunciative organs (independently of the lower jaw taken as a whole instrument) are six in number, viz. the uvula, tongue, lips, teeth, gums, and palate; they may be classed either as single and double, or passive and active organs, as—

Single.	Double.		Active.	Passive.
Tongue	Lips	or,	Tongue	Teeth
Uvula	Gums		Uvula	Gums
Palate	Teeth		Lips	Palate, or roof of the mouth.

The modifications which the voice receives from these organs constitute artificial language, wherever it may be spoken, whether it be the harmonious Italian, or the harsh Teutonic dialects of northern Europe.

Voice, then, and its modifications into speech, depend on certain actions produced

by particular muscles, which actions are voluntary, that is, depending on the will of the individual. Now when the will is not able to control the muscles necessary to produce the actions requisite for the formation of either voice or speech, the defect is called an impediment of speech; which may consist either in an indocility of the muscles to the will, when the structure is perfect, or of a malformed structure of the organs. This, then, is a natural division of impediments of speech. There are, besides, many individuals who find a difficulty in producing and continuing the voice, but yet have none in forming the produced voice into speech; and, on the contrary, there are others who have complete command over the voice, but have no power in modifying it into speech. Here, again, is another natural division of impediments into those of voice and speech: so that we may refer those of voice either into indocility of the muscles, which is deranged function, or into malformed structure; and those of speech may also be classed under either of the heads to which they may belong.

In examining the various forms under which impediments of speech present themselves, we naturally inquire into the general

causes; ascertain the proximate cause of each case; and lastly lay down a rational mode of cure.

The general appearance of stammerers on attempting to speak, is a distorted countenance, flushed cheeks, swollen neck, the veins turgid, spasmodic affections of the upper and lower extremities, but principally of the upper; and if they are able at all to speak, it is, as Shakspeare says, "as wine comes out of a narrow mouthed bottle, either too much at once, or none at all." This arises from anxiety to say as much as possible before the stammer recurs. But it is not easy to give a general view of the disease, because there are scarcely two cases alike—the diversity is endless, varying in degree from the mere hesitation to the utmost complication of organic malformation: thus, there are cases in which the symptoms are mild, and the disease is very severe; and others, in which the symptoms are much more severe than the disease, as is frequently the case with spasmodic closure of the glottis.

A predisposing cause of stammering may exist in a general nervous debility; and this may be brought on by fevers, terror, &c. The affection has also been produced by the uncontrolled sway of the passions; to which

may be added — perhaps its most fertile source — the unchecked manifestation of the imitative faculty. How far stammering may be transmitted through families, is a question that has not as yet been solved; but it is evident that a weakness of the nervous system may be hereditary, and this is certainly one cause which tends to its predisposition.

From the vague manner in which stammering has been attributed to mental and moral causes, much mischief to the sufferer has resulted. This is evidenced in the following case:—A gentleman labouring under spasmodic action of the glottis informed me, that he always felt more excited when he thought of the causes of stammering, "because," said he, "people imagine when they hear me, that it is the result of either mental imbecility or moral turpitude." When this impression, however, was removed from his mind, he quickly threw off the impediment. It evidently arose from the vague manner of referring to such causes, which left much for the imagination to fill up. Where this notion exists, it may be got rid of by pointing out cases of defective utterance in highly moral and talented men, and also by instances of good enunciation in idiots and criminals.

We find that persons who have any physical

defect, are very apt to construe remarks which are not meant for them, to be observations on their own case. The late Lord Byron was a remarkable instance of this. So it is with the stammerer; he feels his defective utterance as a degrading badge, which, by silence, he endeavours to conceal; but as that cannot well be maintained during intercourse with society, he is in a degree impelled to avoid company.

Those who in kindness endeavour to aid a stammerer, by pronouncing the impeding word for him, do not assist, but on the contrary, do him much injury; for, in the first place, every stammerer invariably dislikes any word to be pronounced for him; and secondly, the uttering of the impeding word by the sympathizing individual, does not prevent his continued attempts; for why? because he cannot proceed to the next, that very word being in his mind the connecting link to it; he feels, therefore, that he cannot go on speaking without first pronouncing that particular word, which is at last frequently effected, as it were, by snatching at it during inspiration. Besides all this, the ordinary agitation to speak without stammering is increased; for, by endeavouring to prevent a repetition of ill directed kindness, his efforts

are concentrated to avoid faultering, and the mere want of a word to express an idea, will cause the stammer immediately to recur. Now this continually renewed excitement aggravates the disease; and the individual, feeling the disadvantages resulting from his incapacity of joining in conversation, and even not unfrequently of making himself understood, by those who are in possession of more perfect instruments of mental intercourse, has sufficient cause I think to sour the sweetest temper, and even to account for somewhat of misanthropy.

It has been said that there is the same hasty conception in all stammerers. Now we all conceive ideas faster than we can clothe them in language; therefore, there is the like hasty conception in all persons, whether they be stammerers, or have no such defect. It is quite an error to suppose that the minds of all stammerers are alike, or that there is the same cerebral organization in all cases; for the proud and vain, the superstitious and the sceptic, the man of genius and the idiot, the well informed and the ignorant, are all subject to impediments of speech: I have seen persons with very varied combinations of cerebral organization suffering under de-

fects of utterance. In fact, the capacities of stammerers differ both in kind and degree, so that the hypothesis of the similarity of their minds falls to the ground.

Impediments of speech have been classed under the two heads of malformed organs and functional derangements of perfect organs. In order to ascertain the division to which any particular case may belong, it is our first duty to ascertain if the patient can read or speak when alone, or when under no excitement or embarrassment; for if there be the power to read or speak under such circumstances, it is only one of functional derangement: but if on the other hand, the patient stammer under every circumstance, we may be certain that it arises from malformed organs. Having ascertained this, we have now to discover whether it be of the voice or speech. If the patient find a difficulty in producing voice, and when formed has no control over its continuance or pitch, we may refer the defect to its organ, which will be found to exist in the glottis, where all power of volition is either uncertain or lost; and, on the contrary, if there be no difficulty in producing voice, but merely a want of power in giving to that already formed the characteristic properties of lingual utter-

ance, the defect may be referred to the organs of enunciation.

Under whatever impediment the patient may labour, although his case must be treated according to general principles, yet these will require to be modified and varied according to the necessities of that particular case. "It will always be found," says Dr. Watson, speaking of defects of speech, "that a little shewing is worth a volume of written instructions," and for this reason, sounds cannot be exhibited to the eye, they must be communicated by the ear. Written instructions are very good auxiliaries; but even these must be adapted to the peculiarities of each case, otherwise they will be useless, if, indeed, they have not a worse tendency; for sometimes by such means an impediment is aggravated, instead of being relieved.

All voluntary motion is performed by the aid of the muscles, which is effected in a most extraordinary manner, by the power which the will has over them, named volition. Every muscular motion is the effect of volition, although we are not conscious of any particular direction of power in the common motion of the limbs, as in walking; or of the arm, as in raising it to the head; or, in short, of any of

the ordinary flexures of the body: but if we attempt a new muscular motion of any part, we feel some difficulty at first in performing it; in other words, the will has not as yet exerted its power over that particular train of muscles, and thus are we conscious of a direction of power, or a distinct volition, to effect our wish. This is especially observable in young recruits under training in the military evolutions, and in those who, advanced beyond childhood, are learning to dance, fence, the gymnastic exercises, to play on a musical instrument, &c. It is thus that novices in dancing require to look at their feet to place them aright; but after some little practice, they find this unnecessary, and even feel unconscious of any act of volition in going through complicated dances. The first act of the will to perform any figure appears to excite to action the whole train of muscles employed for those particular motions.

In like manner, persons learning a foreign language, where the pronunciation differs from our own—the French, for instance—exert, at first, a distinct volition for each sound. After some practice, however, the habit is acquired of pronouncing the words with scarcely consciousness of exertion, until they

become so familiar as for whole sentences to be produced, containing very complicated combinations of sound, by one act of volition, and in the course of time, until they even *think* in French. Those who are accustomed to teach languages find a great diversity in the power of correct pronunciation in different pupils: some acquire it at first hearing the words pronounced, while others require not only considerable time, but even many efforts, after the mechanical formation or position of the inner as well as the outer mouth are exhibited to the eye (in conjunction with the sound to the ear), before they can gain it. There are, notwithstanding, great differences in that power of volition in the same individuals at different times.

Now in impediments of the voice, it is evident the defect must be in the larynx, and when it is discovered to be a loss of power over its continuance, it will be found to arise from a spasmodic closing of the glottis: such persons will generally be able to sing, and some to read poetry, without betraying any defect. The reason is this, that in singing, the stream of voice never stops; and in reading poetry, it should seldom be interrupted: now for the stream of voice to flow, it is

necessary that the glottis should remain open. In such cases, the loss of power of the will is over the muscles which open and shut it, and when the impediment recurs, a spasmodic closing of that organ takes place. Various have been the remedies suggested for its cure. Some have proposed speaking in a singing tone; others with the teeth closed:—some, again, the reading of Latin and German; while others think that a violent clenching of the fist, or thrusting out of a limb at the moment of the hesitation, would overcome it. Dr. M'Cormac has recommended inflating the lungs, and speaking with slowness and deliberation; this practice, however, fails of success, because the defect does not arise from a want of air in them. Dr. Arnott was the first to point out the exact nature of the morbid affection, and thereby enable us to apply a remedy on a principle hitherto looked upon as empirical. This remedy is to produce a voice, by droning on any simple sound, as the letter *e* in *berry*, or more properly, the *ir* in *bird*; by which means the glottis is kept open, and the stream of voice uninterruptedly flows through it, and thereby is ready to be modified by the enunciative organs to form any words that may be desired. The only peculiarity

will be a joining of all the words by the drone sound, which, as long as it is continued, will prevent the closure of the glottis, and consequently the recurrence of the impediment. It may thus be expressed:—

e--"Hail-e--holy-e--light-e--offspring-e--of-e--heaven-e--first born"-e-- &c.

Singers produce their first note in a song without the word, in a similar manner to the above; and so, indeed, do many speakers, before they even begin to answer the simplest question: but some give the power of *m*, and others *e*, and thus express a simple affirmative: "*m--yes*," — "*e--yes.*" Consequently the continuous voice or droning is in reality a very common practice; this peculiarity, however, the patient will be enabled to throw off, as he obtains volition over the small muscles which move the glottis.

M. Bourdon (Recherches sur le méchanisme de la respiration, &c. Par. 1820,) considers the glottis as performing other important offices, in addition to the formation of voice; as, for instance, it prevents the escape of air during considerable efforts by closing: thus the lungs are kept inflated, which increases our power: so that if the recurrent nerve could be divided, although we might give re-

lief to this kind of stammer, we should deprive the patient of much power; he would, in fact, be incapacitated from making any considerable exertion.

The larynx is liable to disease like other parts of the body, which more or less affect the voice, all of which must be treated according to the nature of the affection; but in all cases of impediment of voice, it is of great importance to explain the laws under which we speak, in order to induce a regular action and re-action, instead of the hurried and irregular, which all impediments produce: by this means a relapse of the defect will not take place, because the irregular actions, which are the precursors of the morbid affection, are completely removed.

When the impediment arises from the deranged or improper action of any of the enunciative organs, that which is improperly applied must be submitted to certain exercises adapted to obtain or restore its proper and healthy action. This cannot be gained suddenly; it will require both time and attention. Some people, from attempting to correct several mal-actions simultaneously, have, in fact, effected nothing: these ought to be taken separately, and a right action will then be

acquired in a much shorter period than is generally expected. If any of the organs of enunciation be malformed or defective, and hearing and intellect exist, elocutionary science alone, or combined with mechanical, will, even under such disadvantageous circumstances, ultimately overcome the defects.

The tongue and uvula are sometimes suffering under a diminution of sensibility, similar to that which takes place in intoxication, when the speech is affected in like manner. The tongue may also be too large, whereby it is apt to protrude through the teeth, and produce lisping; but it more frequently results from indocility or loss of power of the will over this organ.

The uvula, again, may be divided, as in fissure of the palate, and instances of its entire obliteration sometimes occur. In all these cases, however, the treatment must depend so much on accompanying circumstances, that I should be exceeding the limits of a "few observations" were I to enter into a discussion of their respective treatment; I must, therefore, pass over the defects of the teeth, gums, palate, and mal-position of the jaw, by stating in general, that whatever peculiarities of formation may exist, which render the ordi-

nary production of what are called articulate sounds impossible, recourse must then be had to other means of enunciation; as, for instance, F and V are produced by the action of the under lip and upper teeth; but they likewise may be formed by the upper lip and under teeth, if there be a necessity for it, by any accident of the under lip, or if the lower jaw should project too far for the ordinary action.

Temporary relief may be given by a variety of expedients; but if the physical laws necessary for voice are not complied with, such relief will be but transient. Cases might be adduced where the relapse, arising from ignorance and the non-observance of them, has been worse than the original defect.

Many speakers intuitively observe those laws, and are thereby enabled to declaim for a great length of time without feeling that fatigue which is experienced by those who do not obey them: thus, some speakers exert their diaphragm, and expend as much breath again as others, without however producing so much voice, or being so distinct in the utterance of their words. The chief object of elocutionary, like mechanic science, being to produce the greatest possible effect by the least expenditure of physical power.

Mr. Thelwall is a remarkable instance of the most efficient energies of oratory being a healthful (by observing the natural laws) and not an exhausting exercise. But in his case, in particular, "science and utility came hand in hand with the graces and the arts, and Hygeia trod the path which eloquence had strewn."

Thus have I briefly taken a survey of the structure and functions of the parts necessary to voice and speech, and shewn that the defects and impediments of both arise from mal-actions or malformations of the parts; and, from these facts, pointed out a *rationale* of their cure, with the hope that it may tend to break down the system of secresy and empiricism so long prevalent, and so disgraceful to any civilized society, which through your name it may partially effect. Allow me, then, dear Sir, to subscribe myself in public,

Your most obliged servant,

R. CULL.

14 Caroline Street

~~6, Alfred Place~~, Bedford Square,

July 26, 1833.

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