



D. Hughes Bennett
With the Authors (Compts)

ON

9

LOSS OF SPEECH,

OR THE

POWER OF UTTERANCE,

IN RESPECT TO ITS

CEREBRAL BEARINGS AND CAUSES.

BY

ROBERT DUNN, F.R.C.S., &c.,

AUTHOR OF ESSAYS ON PHYSIOLOGICAL AND MEDICAL PSYCHOLOGY, ETC.

Read in the Department of Physiology at the meeting of the British Association for the
Advancement of Science, at Norwich, August 1868.

[*Reprinted from the BRITISH MEDICAL JOURNAL, January 30th, 1869.*]

PRINTED BY

T. RICHARDS, 37, GREAT QUEEN STREET.

—
MDCCLXIX.

ON LOSS OF SPEECH, OR THE POWER OF
UTTERANCE, IN RESPECT TO ITS CERE-
BRAL BEARINGS AND CAUSES.

Loss of voice may result from a variety of causes, and be dependent upon differing pathological conditions, quite independent of any cerebral lesion or implication of the intellectual consciousness. For instance, aphonia is not unfrequently the consequence of disease of the larynx or vocal organs; at other times, it is occasioned by pressure upon, or change of structure in, the lingual and glosso-pharyngeal nerves, either at their origin or in their course. Dr. Schroeder van der Kolk, indeed, has been led to infer, from the close and intimate connexion between the corpora olivaria and the nuclei of the hypoglossal nerves, that the former are auxiliary ganglia to the latter in the production of certain combinations of movements in the acts of articulation and speech. "For," says he, "speech and the articulation of words require such a multitude of peculiar motions of the tongue, and such an infinite number of varying combinations of its muscular movements, that it cannot appear strange that two auxiliary ganglia should be required for the performance of these functions." After further remarking that "he is acquainted with no other part of the entire spinal cord or brain where the multipolar ganglionic cells are so densely accumulated as in the nuclei of the hypoglossal nerves," and stating his conviction that all motor nerves take their origin from certain groups of multipolar ganglionic cells, he adduces pathological evidence in support of his opinion that the corpora olivaria are the organs for the articulation of the voice, though he admits they are not the organs through which the will directly acts.

The faculty of speech, however, is an *instrument of thought*, and, as such, must have its seat in the nervous apparatus of the intellectual consciousness—that is, in the great hemispherical ganglia of the brain; for, as I have elsewhere said, "language implies a train of thinking. It is the circulating medium of our thoughts—the minister and interpreter of the thoughts, feelings, and emotions of the mind. We reproduce in speech the mutual relations of objects, the relations of our thoughts to objects, and the order and relations of our thoughts to themselves. Hence the wonderful power which articulate words possess on the whole process of thought; and hence, too, their use in forming a broad platform on which the results of all the lower processes of mind are plainly recorded, and from which we commence those higher forms of mental activity which give to reason its all but infinite range and all but omnipotent power." (*Medical Psychology.*)

Now, in all cases of loss of speech or the power of utterance, which are of cerebral origin, there is involved either *functional derangement* or *structural change* in the nervous apparatus of the intellectual consciousness. Out of a number of illustrative instances which have come under my own observation during the last twenty years, I shall content myself with briefly narrating two cases in point—one of structural disease, and the other of functional derangement—in both of which I felt deeply interested at the time of their occurrence, as being of striking significance, and which, unless I am greatly mistaken, throw some light upon, if they do not afford a satisfactory explanation of, the conflicting evidence which has been adduced as to the cerebral seat of the faculty of speech. But, before doing this, I must first make a few observations; and I wish especially to impress upon the mind of every physiological psychologist what ought never, indeed, in this inquiry, to be overlooked or forgotten—viz., that the power of giving utterance to our thoughts and ideas in appropriate language depends upon the due relation being maintained, in its integrity, between the centres of intellectual action and the encephalic motor centres through which the volitional power is exercised in articulate speech. For, although thoughts and ideas may be moulded for expression in the seat of intellectual action, the agency of the will, or volitional power to give them utterance, requires the integrity of the motor centres and their commissural fibres, through which the volitional impulses operate in speech. And thus it is manifestly obvious that loss of speech or the power of utterance, when of cerebral origin, may result alike from disease of the cerebral hemispheres, as the seat of intellectual action, or from disease of the corpora striata and their commissural radiating fibres, as the motor encephalic centres through which the will operates in articulate speech. A special cerebral organ has been assigned to the faculty of speech. The illustrious Gall was the first to locate it in the anterior lobes of the brain; and this allocation has found many advocates among the most distinguished physiologists both in this country and abroad, whose names I need not enumerate. My own pathological researches have led me to espouse it. I am aware that it has been disputed, whether there is a special cerebral organ for this sole and exclusive prerogative of man, the faculty of speech. It is argued that, constituted and mentally endowed as he is, it is as natural for man, when vividly affected, that he should give expression and find utterance, in articulate sounds, for his feelings, emotions and ideas, as that he should voluntarily use his locomotive powers in progression. There can, however, be no dispute that language, as an instrument of thought, is an attribute of the nervous apparatus—of those intellectual centres where the reasoning faculties and the reflecting powers arrange, associate, and mould for articulate utterance, the thoughts, feelings, and emotions of the mind; and hence, however we may continue to dispute about the local habitation or abode of the faculty of speech in the brain, we are assuredly warranted in drawing, as a legitimate inference, that aphasia will result as a necessary consequence from the disintegration and disease of the vesicular matter of the intellectual centres—that is, of the anterior lobes. In France, since the time of Gall, the seat of the faculty of speech has undergone much discussion, and opposing evidence has been adduced. In 1825, Bouillaud placed the faculty of articulate speech in the frontal lobes of the brain, and also maintained that the exercise of thought required the integrity of these lobes; and such, too, are the abiding convictions of my own mind. Andral, on the other hand, has cited fourteen cases of loss of speech without any alteration in the anterior lobes, but where the lesion was in the middle or posterior lobes. The condition of the corpora striata throws a new light on

these cases. Dr. Dax and his son after him have placed the organ of speech exclusively in the left hemisphere of the brain, basing their theory on the fact that, in cases of hemiplegia with aphasia, the paralysis is on the right side. Our distinguished visitor, Professor Broca, who has given us such an able and lucid exposition of his views on the faculty of articulate speech, and who claims the honour of being the first to discover the seat of the organ in the third frontal convolution, is constrained to admit that the left convolution is not the exclusive seat of the faculty, though he maintains the left side of the brain to be the leading side, and the right the automatic. He has quoted Gratiolet on the evolutions of the fœtus in proof that, from the first, the left hemisphere takes the lead in the process of development.

Now, while all physiological psychologists are agreed that the great hemispherical ganglia of the brain are the sole and exclusive seat of all intellectual action and volitional power—of the understanding and the will—I hold it to be as indisputably established, that the corpora striata are the encephalic motor centres of the volitional power of the cerebral hemispheres—the *connecting links of thought with articulate utterance*. These commissural connexions with the centres of intellectual action—the great hemispherical ganglia—are so intimate and extensive, through the agency of innumerable radiating fan-like commissural fibres, that they are evidently subservient, at all points and on every occasion, to the mandates of the will, in every voluntary act or effort. Nor is there, I believe, one single instance on record in which the power of utterance was retained intact, however sound and healthy the hemispherical ganglia may have been found to be, where the corpus striatum on both sides was in a diseased condition.

Again, we have also to bear in mind that the duality of the brain is an admitted fact. The brain is a double organ; and, whilst this doubleness is in harmonious accord with the doubleness of all the organs of sense—nay, more, indeed, is just what *à priori* reasoning would lead us to expect as necessary to the functions of the special senses as double inlets to knowledge—it necessarily follows that the functions of the two cerebral hemispheres must be identical; and, therefore, that, if there be a special organ for the faculty of speech in one hemisphere, there must also be the same in the other. There is a third frontal convolution on the right side, as well as on the left. Statistical statements and reiterated observations on an extensive series of cases may produce, and no doubt have produced, the conviction that the left anterior lobe of the brain is more prone to disease than the right. It was the observance of this fact which led Dr. Dax to the hypothesis that the left hemisphere was exclusively the seat of the faculty of speech; for, in one hundred and forty observations on cases of aphasia, he invariably found the hemiplegic paralysis to be on the right side. Dr. Hughlings Jackson, too, in his most interesting and valuable paper in the *London Hospital Reports* for 1864, also found that, out of thirty-four cases which he has recorded of hemiplegia with loss of speech, there were thirty-one instances in which the paralysis was on the right, and only three on the left, side of the body. But then, beyond the mere fact that the left hemisphere of the brain is more liable to disease than the right, what do these statements prove? One single instance, I maintain—and there are such cases on record, of aphasia in which the paralysis was on the left side—is sufficient to invalidate the hypothesis that the left anterior lobe is the exclusive seat of the faculty of speech. For these and other reasons, I cannot subscribe to the exclusive hypothesis which has been put forth of late; for I claim for the right, as well as for the left anterior lobe, the honour of being the site of the organ of that sole and

exclusive prerogative of man, the faculty of articulate speech. And here, as positive evidence in support of this claim, I would adduce the highly interesting case which Dr. Simpson has recorded (in *Medical Times and Gazette* for Dec. 21, 1867) of extensive lesion in the left inferior frontal convolution of the cerebrum, *without aphasia*. There was no loss of speech. For where we find there had existed, as Dr. Simpson has described, such an extensive cerebral lesion and such disease in the very site and exact region of the posterior part of the left third convolution, where Dr. Broca has located the special organ of speech; and that yet, during life, there was manifested not any impairment of the faculty of speech,—what other conclusion can we draw, if we admit Broca's region to be really the seat of the organ of speech, than this, that the functional power in this case must have been discharged by the organ on the right side of the brain? It retained its perfect integrity; while, with such a state of disease on the left side, the functional power must indisputably have been lost.

But, to proceed with my cases. The first was that of a lady, aged 63—a case of hemiplegia on the right side, with cerebral softening, in which loss of speech was a prominent feature.* She had suffered from three attacks of apoplexy. The first, which occurred in October 1844, seemed “congestive” in its character, and passed away, without any other permanent consequence than this, that she continually used one word for another, not applying appropriate names to the things or persons she desired to signify. The second attack in May 1847, left her permanently hemiplegic on the right side, the power of voluntary motion being completely abolished, and but little sensibility being preserved, though reflex movements could be excited in the lower extremity by tickling the sole of the foot. For the rest of her life she remained altogether incapable of speech, not being able to say yes or no in reply to a simple question, and never getting beyond the utterance of the monosyllable *dat-dat*; and yet all her senses were intact, the motions of the tongue were free, and there was no difficulty of deglutition. She did not seem to have lost any of her intellectual powers; but her emotional sensibility was certainly increased. Her general health continued good up to the time of the last fatal seizure, which occurred in April 1850, without any premonitory symptoms. At the *post mortem* examination, the upper two-thirds of the anterior lobe of the left hemisphere was found to be a pulpy mass, in a state of complete destruction, with colourless softening; while the middle and posterior lobes were sound and healthy; but the greatest change was in the ganglionic masses at their base, and in the commissural structure. The upper half of the corpus striatum on the left side was destroyed by softening; the optic thalamus was shrunken to less than half its natural size, its upper surface being greatly wasted; while, on the right side, a small and recent apoplectic clot was seen on the upper and anterior surface of the corpus striatum, the whole of the upper half of which was in a state of *ramollissement*; while on the upper surface of the thalamus also were noticed some indications of white softening. The corpus callosum was destroyed, except at its anterior and inferior reflexion; and the anterior commissure and fornix were gone. Microscopic examination of the softened parts presented an abundance of compound cells, and of fatty matter in the capillaries. Now, in this case, it was quite evident that, with the disorganisation of the left anterior lobe, its functional power was entirely

* I brought this case under the notice of the Royal Medical and Chirurgical Society, in a paper read June 11th, 1850.

abolished; and, although the right hemisphere was healthy, and there was every evidence, from the history of the case, that it maintained and exercised a functional power as a centre of intellectual action, still the volitional agency was wanting to give utterance to the passing thought, for *the corpus striatum on the same side was not in its integrity.*

I would here remark, and express my conviction, that the imperfect power of articulation, to which we have our attention so constantly called, in hemiplegic patients, there can be little doubt, is most generally due to some structural lesion in the motor centres of volition—that is, in the corpora striata, or among their commissural fan-like fibres, which radiate from them to the cerebral hemispheres.

My next case is one of functional nervous derangement, highly interesting in all its psychological bearings, and strikingly illustrative, as a case in point, of loss of speech or the power of utterance where the intellectual faculties are in abeyance. It was the case of a young woman who accidentally fell into a river, and was nearly drowned. When I first saw her, on her being brought home, about three weeks after the accident, her only medium of communication with the external world was through the senses of sight and touch; for she could neither speak nor hear, taste nor smell. Her mental faculties appeared to be entirely suspended, there being for some time no evidence that any ideas were aroused by the sensations she received, although respondent movements of various kinds were excited through them. Thus her vision at short distances was quick; and so great was the state of exaltation of the general sensibility upon the surface of the body, that the slightest touch would startle her; still, unless she were touched, or an object or person were so placed that she could not avoid seeing the one or the other, she appeared to be quite lost to everything that was passing around her. She had no notion that she was at home, nor the least knowledge of anything about her. She did not even know her own mother, who attended upon her with the most unwearied assiduity and kindness. Her memory and the power of forming and associating ideas were quite gone. Wherever she was placed, there she remained throughout the day. She was very weak, but her bodily health was not much deranged; the tongue was clean, the skin moist, and the pulse quiet and regular; but the bowels were sluggish. After a lapse of three months, an incident occurred in the family which aroused her sensibility, and suddenly brought into play the suspended *power of articulating words, but not the perfect power of speech.* It was in a moment of strong emotional excitement that her power of utterance was suddenly regained. The sight of her mother in excessive anguish and distress forced open the floodgates of her inner sensibility; volition was roused; and the barrier was swept away which had so long kept her spell-bound in silence. Like a disruptive discharge of the nervous force, she suddenly though hesitatingly ejaculated, "W-h-at's the matter?" From this time, she began to articulate a few words; but she never called things by their right names. The pronoun *this* was her favourite word, and it was alike applied to every individual object, animate or inanimate. So long, indeed, as the intellectual centres were in an abnormal condition, the perfect power of speech was in abeyance. Nine months afterwards, under sudden and overwhelming emotional excitement, she fell down in a fit of insensibility of many hours' duration, to the great alarm of every one around her. But it proved critical and sanitary; for, when the insensibility had passed off, she was no longer spell-bound; the veil of oblivion was withdrawn. Her speech was restored. She awoke, as from a sleep of twelve months' duration, in the possession of her natural faculties and former knowledge, but without the slightest

recollection of anything that had taken place during the interval of the past year, in which her mental faculties had been suspended.*

In conclusion, I cannot too strongly recommend to the attention of all who are interested in this most interesting subject—aphasia—a most valuable series of papers now in the course of publication in the *Journal of Mental Science*, by Dr. Bateman. They are full of interest, sound reasoning, and the most valuable information, presenting us with a complete *resumé* of the subject from the earliest times.

* This case of suspension of the mental faculties, of the powers of speech and special senses, with the exception of sight and touch, and continuing for many months, I published, with a Commentary on its bearings, upon the Philosophy of the Human Mind, and the Physiological Psychology of Man, in the BRITISH MEDICAL JOURNAL, 1855.



