From the Author

A

CASE OF HEMIPLEGIA.

WITH CEREBRAL SOFTENING,

AND IN WHICH

LOSS OF SPEECH WAS A PROMINENT SYMPTOM.

BY

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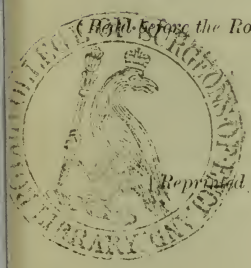

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A CASE OF HEMIPLEGIA,

ETC.

In submitting to notice the following detail of a case of hemiplegia, with softening of the cerebral substance, and in which the loss of speech was a prominent feature, it is unnecessary to reiterate the observation made on a former occasion,* as to the special interest with which individual cases may become invested; in the present instance, however, I would observe, that the patient having had two previous apoplectic attacks under my own observation, the case was one of peculiar interest to myself, and may not be found unworthy of record, or, at least, of a more extended consideration. At the same time, I would take this opportunity of giving expression to a conviction of my own mind, that medical psychology is too much neglected by us.

The psychological phenomena of disease present a wide and an interesting field for observation and inquiry; and it is, I think, greatly to be regretted that the subject has not more fully engaged the attention of those distinguished men to whom we are so much indebted, and to none more than a former president of the Medico-Chirurgical Society, my friend, Dr. Bright, for their valuable researches into the pathology of the brain. As the seat of conscious existence, and of human feelings and emotions—of all our hopes and fears, our joys and sorrows, and of the higher attributes of intellect and reason, the *mind*, it is admitted, ought to be studied in connexion

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* On a Case of Apoplexy of the Cerebellum, read March 13th, 1849, and published in vol. xxxii. of the Medico-Chirurgical Transactions.

with the material conditions of the encephalon, through which its operations and workings are manifested, in health and disease. Hence the necessity and the importance of noting and of studying the psychological manifestations or symptoms as they present themselves, especially in diseases of the brain and nervous system. The attempt to trace the connexion between structural diseases of particular portions of the encephalon, and of deranged, impaired, or obliterated manifestations of the mind, is clearly one which comes legitimately within the province of the medical observer, however great the difficulties by which the endeavour may be surrounded; but in private practice the opportunities for such investigations are very limited, and I am aware how prone we are, when the experience is limited, to attach undue importance to individual cases. It is therefore not without some hesitation that I have submitted the following detail and observations to the of the Society.

The subject of this communication died in a state of coma, on the 18th of last April, in the sixty-sixth year of her age. She was of a mixed temperament, the sanguineous and nervous, of active and industrious habits, an even temper, and happy disposition, and much beloved by her children and friends. Her education had been limited.

I was first called to attend her on the 6th of October, 1844, at four o'clock in the morning, in her first apoplectic seizure. Up to that time she had enjoyed excellent health, but she had retired to bed, the evening before, rather more than ordinarily fatigued, in consequence of the indisposition of one of her daughters. She slept with the invalid. A little before four o'clock in the morning, the daughter was awaked by a strange noise her mother was making, and I was immediately sent for. I found her in a state of coma, with stertorous breathing, head hot, face flushed and turgid, mouth drawn down to one side, pulse full and labouring. I bled her freely from the arm, gave five grains of calomel, and a strong cathartic draught, and applied a cold lotion to the head. At my next visit, about four hours afterwards, she had partially recovered consciousness, but I found her hemiplegic on the right side. A blister was applied to the nape of the neck, and a grain of

calomel ordered to be given every four hours, with a dose of saline mixture.

Her recovery was quick; she regained the free and full use of the arm and leg; and in a few months her general health appeared to be perfectly re-established. One peculiarity, however, remained—the habit of using one word for another, and of not applying appropriate names to the things signified. she never afterwards called even her own daughters by their right names. She had recovered so soon, and so perfectly, that I was inclined to view the attack as one of simple or congestive apoplexy; but the peculiarity in respect to verbal language arrested my attention, and led me to fear the existence of some structural lesion of the encephalon.

From this time her health continued good, and she discharged all the household and relative duties of life as usual, with pleasure to herself and family, up to the period of her second attack, which took place on the 17th of May, 1847. Her daughter found her, between eight and nine o'clock in the morning of that day, lying in a state of insensibility, on her back, upon the floor of her bed-room. She had opened the window-shutters of the bed-room, removed the bed-clothes, and whilst in the act, it was supposed, of making the bed, had fallen down in a fit on the floor. I was immediately summoned. The contrast was striking between the symptoms in this and those of the former seizure. The coma was alike profound in both, but there was little, if any, stertor in the breathing. Instead of the hot and flushed face, it was pale, and bedewed with a cold, clammy moisture; the extremities were cold, and the pulse, instead of being full and labouring, was feeble, weak, and fluttering. An opposite treatment was clearly indicated. I gave her freely ammonia and Hoffman's anodyne; applied warmth to the surface of the body, and cataplasms of mustard to the soles of the feet and nape of the neck. A turpentine enema was administered. She gradually recovered her consciousness, but was speechless for the remainder of her life. In a few hours from the time of the attack she could be roused when loudly spoken to, but immediately relapsed into insensibility.

She was again, and for the remainder of her life, hemiplegic,

on the right side, completely, as to motion, but some sensation remained; there was no muscular rigidity whatever. Active reflex movements were exerted, by tickling the foot, but none could be induced in the upper extremity.

On the fourth day from the time of the attack, I had the benefit of consultation on her case, with my friend, Dr. Todd. By that time she had acquired a little more consciousness, but she was extremely low, and her pulse was feeble. She yawned a great deal, and often applied her hand to her left temple, as if in pain there. The fæces were passed involuntarily.

Dr. Todd thought her case presented a fitting opportunity for testing the muscular irritability in hemiplegia, and, having assisted him in making the experiments, I can vouch for the correctness of the following account, given in his paper on "the muscular irritability of paralyzed muscles," in vol. xxx. of the Society's *Transactions* :—

The hands, and afterwards the feet, were placed in basins of water. I first used a Cruikshank's battery, of fifty plates, but without effect, on either limb. I then had recourse to the magneto-electric rotation machine; by this active movements were excited in the healthy arm and leg, some in the palsied leg, and very slight and feeble contractions in the palsied arm. On applying the poles directly to the palsied limbs, contractions were excited, but even these were extremely feeble and partial.

On the 26th of May, five days afterwards, I repeated the experiment. The patient had acquired rather more consciousness and strength, but the palsied limbs were apparently unchanged. When the current was passed through both arms, by means of basins, only one of the two muscles of the paralyzed arm were feebly excited, whereas the sound one was thrown into energetic action. The same results precisely were observed in the legs.*

The improvement in her general health after this attack was very slow, but progressive, and ultimately she got remarkably well. But she was paralyzed on the right side, and

* Medico-Chirurgical Transactions, vol. xxx. p. 215-16.

speechless. In the upper extremity, the hemiplegia, in respect both to motion and sensation, was complete; in the lower, the sense of feeling was not altogether abolished, and there apparently remained some slight power of motion. She was able, with the assistance of her daughter, to move about the room. The arm was generally kept in a flexed position; the muscles were slightly rigid; the fingers were bent inwards upon the hand, and it was with some difficulty that they could be straightened. Although speechless for the remainder of her life, all the special senses were intact,—she could see and hear, smell and taste; the motions of the tongue were free, and there was no difficulty in deglutition. She was perfectly sensible, took an interest in passing events, more especially in anything appertaining to her family and friends; her emotional excitability, indeed, appeared rather to be increased. She had never been much interested in books, and latterly less so than formerly, but it had been her daily practice throughout life to read a chapter in the Bible every morning, and she never relinquished the habit.

In reply to a simple question she could not say *yes* or *no*, and never could get beyond the utterance of the monosyllable, *dat-dat*, while the conscious failure of the effort found expression in a hopeless shake of the head, and often in the exhibition of emotional feeling and a gush of tears. Still, with the exception of the paralysis and loss of speech, her general health, latterly, was good, and she was cheerful and happy. Her appetite was excellent, and she had become stouter. Seated in the family circle, and surrounded by her children, she looked so well and was so happy, that no one would have taken her to be an invalid, but the illusion vanished with the effort at locomotion, or the attempt to mould into expression, and to convey by words to the minds of others the thoughts that were passing in her own.

The last and fatal seizure was as sudden as the two former had been. On the 14th of last April, as she was being undressed at about ten o'clock in the evening, she fell suddenly back in a fit, in her chair, and for a short time the paralyzed arm and leg shook violently. With some difficulty she was lifted into bed in a state of insensibility and utter helplessness.

I was sent for. I found her, as at the second attack, in a state of great collapse, and comatose, with loud stertor, and with her left side as helpless as her right, completely paralyzed, passive, and powerless. The pulse was small, weak, and fluttering; the whole surface of the body, as well as the extremities, were cold and clammy. In the right palsied arm and leg were noticed occasional convulsive jerks, but none in the left. Tickling the sole of the right foot excited active reflex movements, but the same means produced no effect on the left. The sphincter ani was relaxed. The teeth were so firmly fixed that nothing could be got into the mouth. Warmth was applied to the surface of the body and to the feet. A turpentine enema was thrown up, and a blister applied to the nape of the neck, but, I need scarcely say, without any good effect. She gradually became weaker, and expired quietly on the 18th, the fourth day from the attack.

Post-mortem examination, twenty-eight hours afterwards.—On carefully raising the calvarium, leaving the dura mater *in situ*, the sinuses were found gorged with dark, black blood, and I was struck with the want of symmetry between the hemispheres of the brain. The left on its anterior and upper surface was much *depressed* and *shrunken*, and on applying the finger to the depressed portion, a distinct fluctuation was felt beneath the membrane. This was found to arise, on the removal of the dura mater, from the presence of serous effusion into the arachnoid sac, to the extent of several ounces; the other membranes were opaque and thickened. The right hemisphere presented nothing abnormal in its appearance, and on carefully slicing down its substance to the level of the corpus callosum, the structure throughout was healthy. When its lateral ventricle was laid open, a very small and recent apoplectic clot was seen upon the upper and anterior surface of the corpus striatum, surrounded on all sides by a red streaky extravasation into the broken-down tissue of the striated body. The whole of its upper half was in a state of ramollissement, and on the outer surface also of the thalamus opticus were noticed some indications of white softening. Of the left hemisphere the upper two-thirds of the anterior lobe was a pulpy mass, *in a state of complete destruction, with colourless soften-*

ing, while the middle and posterior lobes were sound and healthy. The corpus callosum was destroyed, except at its anterior and inferior reflexion, and so also was the upper half of the corpus striatum on the left side. The optic thalamus was shrunken to less than half its natural size, its upper surface being greatly wasted. The anterior commissure and fornix were gone, but the corpora geniculata were sound and healthy. It was only the lower plane of the left anterior lobe and of corpus striatum which maintained their integrity. There was some serous effusion into the ventricles, and at the basis of the skull.

I had the advantage of Dr. Todd's assistance in investigating the diseased parts, and a microscopic examination showed an abundance of compound cells in the softened portions, and of capillaries filled with fat. The small branches of the middle artery were faulty in structure. The cerebellum, basis of the brain, medulla oblongata, and the whole of the sensory ganglia, were in a healthy state.

The case affords a good illustration of the varying character of apoplectic seizures, and offers some points of physiological interest, in reference to the faculty of speech.

The first fit presents us with a common form of the disease, and from which the recovery was so perfect, that but for the peculiarity which remained, in respect to verbal language, I was at the time disposed, as I have observed, to view it in the light of a case of simple or congestive apoplexy. It is not to be denied that such cases do occur, and in them the paralysis is transient, disappearing with the removal of the pressure; but they are, I am inclined to think, far less frequent than is generally supposed. When the paralysis is at all persistent, I believe it to be associated with a rupture in the continuity of the fibrous structure of the brain. This is not a mere hypothetical opinion.

I have had several opportunities of examining patients that have died of other diseases, who have previously had apoplectic seizures, but with whom all traces of paralysis had disappeared, and at periods varying from months to years from the time of the paralytic stroke, and in every case I have found cysts, or other evidences of structural

lesion. The severity and duration of the paralysis are no doubt dependent upon the extent and the situation of the extravasation; and as a matter of actual observation, I quite agree with Dr. Bright, and other observers, "that effusions take place more frequently than in any other situation, at a little to the outside of the corpus striatum in either hemisphere, just at the point where many large vessels may be traced coming off from the trunks in the fossa Sylvii, and pervading the brain."* In the present instance, from the appearances observed at the post-mortem inspection, the degeneration of the anterior lobe of the left hemisphere, the wasted and shrunken condition of the corpus striatum and thalamus opticus, on the same side, and the faulty state of the small vessels in the fissura Sylvii, it is reasonable to infer that the symptoms were not due to mere congestion, but that some extravasation, however slight and limited at the time, had taken place, and which in all probability, by an arrest of nutrition, laid the foundation for the subsequent and more serious affection.

In the second fit, as well as in the last fatal attack, we have examples of that second form of apoplexy, which Dr. Abercrombie has so graphically described. And while the actual pathological condition, at the time of the second seizure, is veiled in obscurity, the fatal issue of the third, and the hemiplegia of the left side which preceded it, were evidently due to the rupture and clot in the right corpus striatum.

In respect to the second fit, although there was no evidence found, at the post-mortem inspection, of apoplectic cysts, the whole of the upper two-thirds of the anterior lobe being in a state of softened degeneration, still it is not improbable that this condition was due as a consequence to previous extravasation into its substance. But be that as it may, the diseased appearances afford a satisfactory explanation of the paralysis, and if I am not mistaken, throw some light on the cause of the loss of speech.

The loss of the power of articulation may arise from a

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* Dr. Bright's Hospital Reports—Diseases of the Brain and Nervous System, vol. ii. p. 331.

variety of causes, independently of cerebral lesion; but these are foreign to our present consideration, for in this instance it is abundantly manifest, that the cause of the loss of speech was of cerebral origin, implicating the encephalic motor centres, through which the volitional power is exercised.

A great mass of evidence has been collected in support of the opinion of Gall, that the seat of the faculty of speech is in the anterior lobes of the cerebrum.

In 1848, two memoirs were read before the Académie Nationale de Médecine de Paris,—one by M. Belhomme, "De la Localisation de la Parole dans les Lobes Antèrieurs du Cerveau;" and the other, by M. Bouillaud, entitled "Nouvelles Récherches Cliniques Propres à Demontrer que le sens du Langage Articulé et le Principe co-ordinateur des Mouvements de la Parole Resident dans les Lobules Antérieurs du Cerveau," containing new observations made by him since the date of his former paper, in 1839.

The subject has undergone much discussion in France, and opposing evidence has been adduced. Andral* gives the particulars of two cases,—one in which loss of speech was the only cephalic symptom, and another, where it was complicated with hemiplegia of the right side, but the intellect was unaffected. They were both in old women—the first eighty, and the other seventy-three years of age. In the first case the speech was lost all at once, but not in a fit, three years before her death. She was never known to have lost her consciousness, nor the power of sensation or motion. Andral says,—"Tout semblait nous annoncer que l'intelligence avait son integrité. Dans les quatre membres, les mouvemens etaient libres, faciles, et la malade sentait bien les impressions douleureuses qu'on cherchait à faire naître sur la peau qui les recouvre. Lorsqu'on lui demandait si elle souffrait de la tête, ou si elle en avait souffert, elle repondait par un geste negatif. L'ouïe, la vue, et l'odorat, s'accomplissaient comme dans l'etat normal." At the autopsy, in the left hemisphere there was found a small ramollissement, of the size of a large pea—"Au

* Clinique Médicale—Maladies de l'Encephale, vol. v. p. 454

niveau et en dehors de l'extremité postérieure du corps strié tout-a-fait à sa pointe;" and in the right hemisphere a similar ramollissement—" A l'union de la moitié antérieure avec la moitié postérieure de cet hémisphère, à une égale distance de ces bords interne et externe, et au point de jonction des deux tiers supérieurs avec le tiers inférieur de la masse nerveuse située du centre ovale de Vieussens." These were the only cerebral lesions. In the second case—" Dans tout l'encephale, il n'y a d'altéré que le corps strié du côté gauche." It was a soft, pulpy mass to within three lines of its exterior surface. Andral observes: " Le siége du ramollissement est digne de remarque; il est exactement borné à l'un des corps striés, ce qui n'empêche pas qu'il n'y ait paralysie des deux membres et abolition de la faculté de parler." Other cases have been recorded, in which the structural lesion was confined to the corpora striata, and a few in which the middle and posterior lobes were implicated in the disease of the striated bodies.

Now, in the consideration of this subject, it is never to be forgotten, that the perfect power of speech, that is, the power of giving utterance to our thoughts and ideas in suitable and appropriate language, *depends upon the due relation between the centres of intellectual action, and of the encephalic motor centres, through which the volitional power is exercised.* Thoughts or ideas may be moulded for expression in the seat of intellectual action, but the due agency of the volitional power, to give them utterance, requires the integrity of the commissural fibres, and of the motor centres, through which the volitional impulses of thought operate in speech. The imperfect power of articulation which we so constantly meet with, in hemiplegic patients, I have no doubt is owing to some structural lesion in the integrity of the motor centre of volition.

A highly interesting and instructive case, bearing upon this point, came under my own observation, a few years ago. It was that of a young woman, in whom there existed, for many months, a suspension of the mental faculties, power of speech and special senses, with the exception of sight and touch, in consequence of her having accidentally fallen into a river, and been nearly drowned. An account of the case was published in The Lancet of 1845. 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 hear nor speak, smell nor taste. 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 was touched, or an object or person was 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 roused her sensibility, and suddenly brought into play the suspended power of articulating words, *but not the perfect power of speech.* Seeing her mother in a state of excessive agitation and grief, she became excited herself, and, in the emotional paroxysm of the moment, she gave utterance, by ejaculating, Wh-a-t's the mat-ter? 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; and, so long as *the intellectual centre was 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, but which proved critical and sanatory. She awoke 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 twelve months that her faculties had been suspended.

It is admitted that there is no point in physiology more clearly made out than that the cerebral or great hemispherical ganglia —that vast sheet of vesicular matter which crowns the convoluted surface of the cerebral lobes—is the centre of intellectual action, of perception, volition, and of all the intellectual operations and processes; and my own mind rests in the conviction, that the amount of pathological and other evidence which has been amassed irresistibly establishes the position of Gall, that in speech *the power to frame the thought and mould it for expression has its seat in the anterior lobes of the cerebrum.* I hold it to be as indisputably established, that the corpora striata are the *motor centres of the volitional power* of the encephalon. *They are not the seat of volition itself, for that is an attribute of the intellect,* but the motor centres through which the volitional impulses of the cerebral hemispheres operate—*the connecting link of thought with action.* Their commissural connexion with the centre of intellectual action, the great hemispherical ganglia, is so intimate and so extensive, that they are evidently subservient, at all points, through the agency of innumerable radiating commissural fibres, to the mandates of the will, or volitional power of the hemispheres on all occasions, and in every voluntary act or effort; and hence does it not necessarily follow that loss of speech or power of utterance will alike result from *disease of the anterior lobes, or of such parts of the corpora striata as are in direct relation with them?*

There is not, I believe, a single instance on record in which the power of utterance was retained *intact,* however sound and healthy the great hemispherical ganglia may have been found, where the corpora striata were both diseased. The apparently conflicting evidence which has been adduced as to the seat of the faculty of speech admits of a satisfactory explanation, when thus considered in relation to the centres of intellectual action and motor centres of volition.

In the present case, which I have narrated, it is quite evident that with the disorganization of the left anterior lobe

its functional power was entirely abolished; and though the right hemisphere was healthy, and there is every evidence, from the history of the case, that it maintained and exercised its 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 was not in its integrity.

The condition of the irritability of the muscles of paralyzed limbs being still, I believe, an unsettled question with my friends Dr. Marshall Hall and Dr. Todd, it is to me a matter of regret that the subject had not been put to the test of *another* experiment in the case of this patient, especially as the paralyzed limbs had not wasted, but in their nutritive condition had latterly improved. There can be no doubt, in respect to the question at issue, that both experimenters have with perfect truth recorded the result of their experiments, and the discrepancy has, I think, been satisfactorily explained. They are alike anxious to promulgate sound physiological views, and to furnish us with new and useful aids in diagnosis. To Dr. Marshall Hall, indeed, in his capacity alone of expounder of the *doctrine of reflex action*, and of its practical application in the elucidation of symptoms, and to therapeutics, every enlightened practitioner is under great obligations; still, on the subject of muscular contractility, though with great deference, I dissent from his views. I think that the late Dr. Reid, in his memoir "On the Relation between Muscular Contractility and the Nervous System,"* has fully established the fact, that *muscular irritability is a special vital endowment of the tissue itself*, and not dependent upon, or derived from, the spinal cord;—in truth, that the *vis insita* of Haller is an inherent vital property, and perfectly independent of the *vis nervosa*, though generally called into action through its instrumentality. He has shown that this *vis insita*, like all other vital properties, depends for the energy of its action upon its state of nutrition, and this, again, in its turn, is regulated, *cæteris paribus*, by the degree of exercise to which the muscles are subjected.

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* Physiological, Anatomical, and Pathological Researches, by J. Reid, M.D. & F.R.C.S.E.

Dr. Reid has experimentally proved—1st. "If muscles, separated from their connexions with nerves, be kept in a state of occasional use, (by the application of artificial stimuli,) their nutrition is kept up, and their contractility retained for any length of time; and 2ndly. If the contractility of a muscle thus circumstanced be exhausted by repeated stimulation, it will be recovered after an interval of some days after section of the nerves." Now, it appears to me, that, as in the case of *exhaustion* after excessive fatigue, time and rest are required *for nutrition* to restore and replenish the contractile power, the *vis insita* of the muscles, so in the case of a paralytic attack, after the shock which the whole system has sustained, the degree to which the irritability of the muscles in the palsied limb may be deranged, and the condition in which they may afterwards remain, will essentially depend upon the state of *the nutrition* in these muscles themselves.

Norfolk-street, Strand, Oct. 1850.