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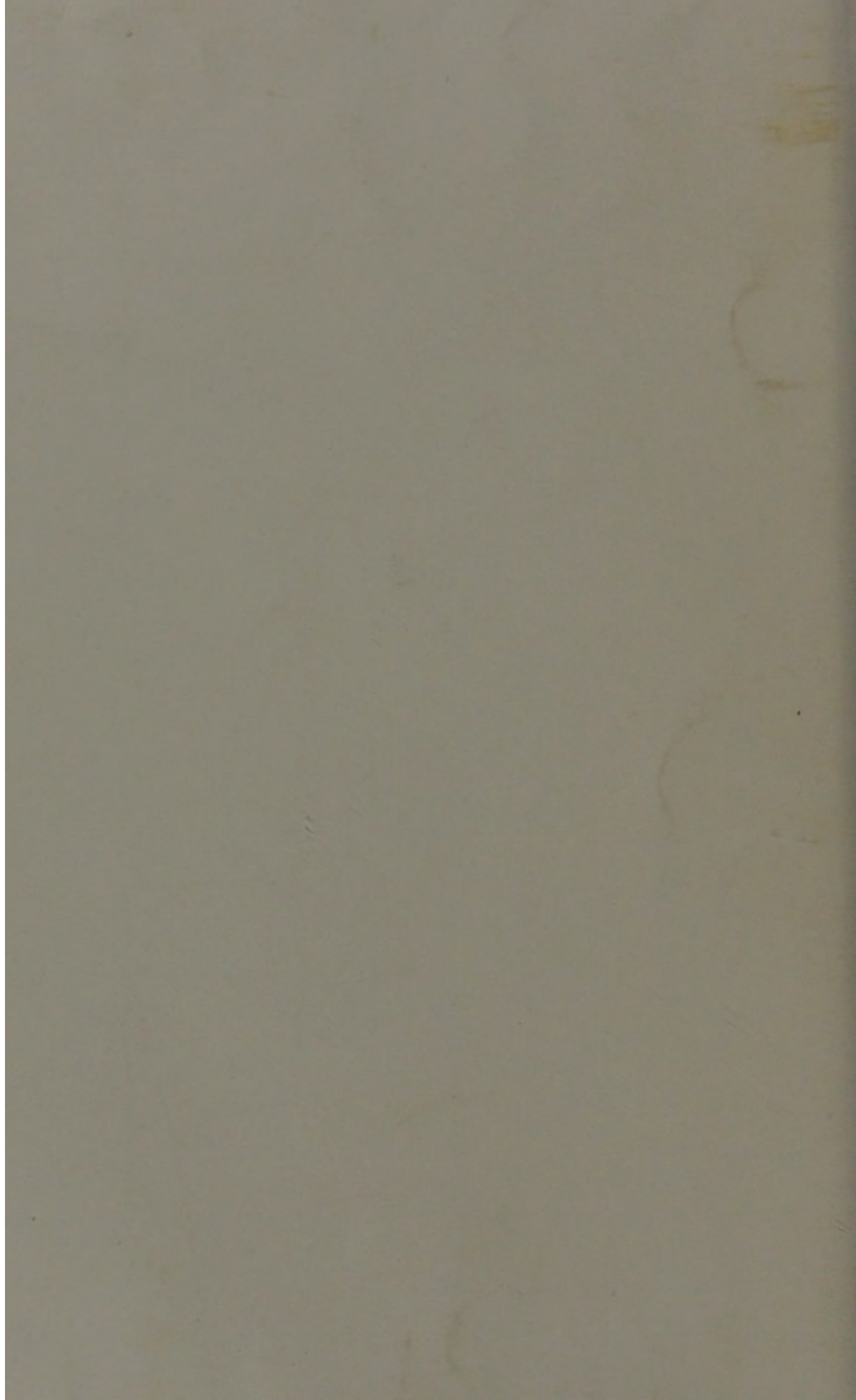
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ON

2

APHASIA,

OR

LOSS OF SPEECH IN CEREBRAL DISEASE.

BY

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THE ELKS LODGE NO. 101

ON
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PART II.

FROM the brief summary I have given of the labours of the pathologists of the French school, it will be observed that the evidence deducible therefrom is of such a conflicting character as to leave quite unsettled the complex question of the localisation of the faculty of speech. The history of the continental contributions to the literature of aphasia would, however, be very incomplete, without a brief glance at the researches of the German and Dutch physiologists.

Schröder van der Kolk,* in his chapter on the accessory ganglia in the medulla oblongata, endeavours to establish a close physiological and pathological connection between the function of articulation and speech and the corpora olivaria. Besides citing numerous cases in illustration of his hypothesis, he gives an *a priori* reason for his theory in the fact that the corpora olivaria occur only in mammalia—that on comparing these organs as occurring among mammalia themselves, it is to be observed that they nowhere exist on so extensive a scale, and are so fully developed, or present so strongly plaited a corpus ciliare, as in man; that in the higher mammalia, as the apes, they are most like those in man, and that in man they exceed in circumference by two

* On the Minute Structure and Functions of the Spinal Cord and Medulla Oblongata. Translated by Dr. W. D. Moore, p. 140.

or three times those of the chimpanzee. To Van der Kolk these circumstances are suggestive of the idea that in man the corpora olivaria have a much more important function to discharge than in animals; and as these bodies are connected by special fasciculi with the nuclei of the hypoglossus, he looks upon them as auxiliary ganglia of that nerve, and as such, joined to it for the production of special combinations of movement. He also suspects that the very delicate combinations of motion in the human tongue in articulation and speech, may afford an explanation of the much greater size of the olivary bodies, and of their more intimate connection with the nuclei of the hypoglossus. In support of these views Van der Kolk cites several cases of impairment of the faculty of speech, in all of which there was found after death lesion or degeneration of the olivary bodies. Of these observations the limits of this essay will only permit me briefly to allude to one which seems to me to be particularly pertinent to the subject now under consideration.

G. van A., aged 22, had been dumb from birth, but not deaf. She had always enjoyed good health, and although idiotic, usually understood all that was said to her; but had never been able to form an articulate sound, and only now and then uttered a squeak. The patient having died from the effects of diarrhœa, the following appearances were observed at the autopsy. On removing the hard, but thin and small skull, the cerebrum appeared small and ill-developed; the convolutions, especially on the anterior lobes, were slight and not numerous; in consequence of the diminished arching of the anterior lobes the so-called convolutions of the third rank of Foville were very small, and scarcely shown on the inner longitudinal surface of the hemispheres; the convolutions on the posterior lobes were also but little developed. On the anterior lobes, beneath the os frontis, was seen a spot of the size of the palm of a small hand, and bloody exudation under the arachnoid, in which situation the pia mater was adherent to the cortical substance, which was in many parts softened. On section the grey and white substances were here and there thickly studded with red sanguineous points; the thalami optici presented a strikingly yellow colour; the pons Varolii was smaller and narrower than usual, and the corpora olivaria were unusually minute and slightly developed, being less than one third of the normal size.

Van der Kolk, in commenting on this case remarks: that as in this instance there was complete inability to articulate,

and consequent absence of speech, without deafness and without proper paralysis of the tongue, which the patient could move, coinciding with an extremely defective development of the corpora olivaria; therefore the influence of these bodies on the complicated movements of the tongue in speech seemed scarcely to admit of doubt!

It will be observed that in laying great stress on the fact of the atrophy of the olivary bodies, the learned Utrecht Professor quite loses sight of the deductions to be drawn from the extremely imperfect development of the frontal convolutions, and also from the positive diseased condition of the anterior lobes; and it seems to me that both Bouillaud and Broca would have a word to say here in favour of their respective theories.

In further support of his views Van der Kolk quotes two cases, observed by Cruveilhier, in one of which the right corpus olivare had undergone grey degeneration, and in the other both these bodies were found as hard as cartilage.

Romberg mentions the case of a sailor, who on being struck on the left side of the head by a loose rope, at once fell into a state of insensibility. After a quarter of an hour he recovered consciousness, but was found to have lost the use of the right half of the body, and to have become speechless. Three weeks afterwards the mobility of the extremities had been restored, and the tongue could be moved in every direction without difficulty, but the faculty of speech was arrested; and although perfectly conscious, it was only with the greatest effort that he was able to utter a few inarticulate sounds. Some blood was taken locally on several occasions by leeches applied behind the left ear, a combination of sulphate of magnesia and tartar emetic being administered at the same time; and in three weeks from the commencement of this treatment his speech returned, and he was completely restored.* He also mentions an interesting case of impairment of the speech, with partial paralysis of the left side, which after death was seen to depend upon a large tumour, seated in the right half of the pons Varolii, and extending posteriorly under the right olivary body.†

Dr. Bergmann, of Hildesheim, has written a masterly treatise on loss of memory and of speech, illustrating it by a

* On the Nervous Diseases of Man. Translated by Dr. Sieveking, p. 310

† Ibid, p. 407.

series of well recorded cases, to some of which I propose very briefly to refer.*

A ploughman, Wt., aged 40, of short stature, fell through the trap door of a garret upon the left side of the head. Much blood immediately flowed from the left ear and mouth, the bleeding from the ear continuing for two days. For four weeks he lay stunned and without power of recollection; he heard nothing, his speech was unintelligible, and his eyes were closed. When his consciousness was fully recovered, it was noticed that both eyes were turned towards the nose, (there was double convergent strabismus), the pupils were somewhat dilated and sluggish, there was intolerance of light and diplopia; his memory was observed to have suffered in a peculiar manner—the memory of *proper names and of substantives* was abolished, whilst that of *things and places* remained unimpaired; and he also had retained the power of correctly speaking and using *verbs*. He knew what he wished and ought to say, but could not connect the letters of substantives one with another. He knew exactly the place, the way, the streets, and their names, although he was quite unable to give utterance to these names. The same defect was noticed in reference to the furniture, and in fact to every other object. He was shown a penknife, a key, a looking glass, and he described their use by a periphrase. He said of the scissors which were shown him—it is what we cut with. On pointing to the windows he said, it is what we see through—what admits light.

A man of large stature, strong constitution, and ruddy complexion, with knowing, lively, expressive eyes, for upwards of ten years had never spoken a single word, not even a yes or no, when alone or in company. He heard well, had a good memory, and a proper supply of ideas. He wrote a particularly firm and correct hand, and was never tired of putting his ideas and foolish fancies on paper. From these written effusions it was seen that his principal delusion was that he considered himself a great lord and potentate, who sent his decrees and decisions forth to the world. He was always accusing others, but in the most dignified language; and he commanded and gave his instructions after the manner of one learned in the law of the highest courts of appeal. It was evident that he had intelligence, but a perverted one; he heard and understood, as his written answers and other be-

* Einige Bemerkungen über Störungen des Gedächtniss und der Sprache, Allgemeine Zeitschrift für Psychiatrie, 1849, S. 657.

haviour clearly showed. He was docile, he waited on the other patients like a brave nurse, and willingly employed himself with ordinary handiwork. During the many years that this man remained under observation, no means were left untried to ascertain whether he could be made to speak; but no fraud, no surprise, no sudden or sharp pain, no electric shock, no hot iron, no entreaty, no threat had ever succeeded in extracting from him even the slightest yes or no.

Dr. Bergmann, in commenting upon this singular case, and in endeavouring to reach the explanation of the physiological and pathological enigma involved in it, suggests two hypotheses: That there may have been a fixed idea, a fixed will, a caprice, an obstinate strong purpose, his physiognomy seeming to say—I remain still firm and true to myself, I will carry out my purpose, I will triumph, and I will not yield. Then on the other hand, if one considers that he was good-hearted and well-disposed, obliging and friendly, and that he was scarcely ever angry, notwithstanding all the opposition to his wishes, it would seem more probable that there was a real organic inner momentum (*inneres organisches Moment*), some hidden impediment which produced loss of speech.

The only remaining case from this author to which I shall allude is that of Anna W., æt. 30, who up to the age of twenty was sound in mind and body, when a nervous fever laid the foundation of mental disturbance and chronic headache. After a time weakness of memory was noticed, and she became indifferent, unfeeling, and unsympathising. There was this peculiarity about the memory—that it was particularly weak and almost extinct in reference to subjects of recent date, whilst she could well remember the events of the earlier period of her illness. For upwards of two years she had never spoken a word, however much one roused her, although her manner gave unmistakable evidence that she could hear and understand what she heard. She had thoughts, conceptions, and ideas; there must then, says Dr. Bergmann, be an organic defect which rendered her unable to give vent to her thoughts by means of words or even by a sound.

I shall again have occasion to refer to Dr. Bergmann's highly philosophical treatise in another part of this essay.

Dr. Hasbach, of Geldern, has recorded the following case of *left hemiplegia with aphasia*:—A merchant, aged thirty-six, with a robust, thick-set body, who, from speculating in the funds, became in a short time very rich, was suddenly seized

in the night after a hearty meal with apoplexy, resulting in complete paralysis of the left arm and leg, and loss of speech. After a month's treatment, the paralysis of the leg had so far subsided that he could walk slowly with the aid of a stick, the upper extremity remaining, however, entirely paralysed and deprived of sensation. With the exception of one single phrase, he did not recover the power of speech, the only words he could articulate being, "*gerechter Gott*," which he would repeat a hundred times each day. There was also this remarkable peculiarity, that although he could pronounce clearly and distinctly so difficult a phrase as *gerechter Gott*, he was quite unable to articulate separately the letters of which this expression was composed.*

Dr. W. Nasse, of Bonn, has written a valuable essay on defects of speech, in which he mentions the case of a man thirty years of age, who, after repeated attacks of apoplexy, was paralysed on one side of the body, retaining possession of his mental faculties. The movements of his tongue were unfettered, and he could make himself understood; in the middle of his sentences, however, he often applied wrong words, but immediately recognised his mistake, expressed concern for it, and would endeavour to extricate himself from his difficulty by gesture and periphrase. If the required word were named before him, he would repeat it with glib tongue, and could also write it down. After repeated attacks of cerebral congestion, the power of speech progressively diminished, and he gradually fell into a state of imbecility.

Dr. Nasse, in his general remarks, calls attention to the fact that most frequently proper names and substantives, words which are first learnt in childhood, and which are in more general use, seem to disappear, whilst verbs and adjectives, which are acquired later, remain preserved. He also thinks the loss of the memory of words bears no relation to the condition of the muscular power.†

Von Benedikt and Braunwart have an excellent and exhaustive paper on lesions of the faculty of speech, from which I shall only quote the following case of *aphasia from lead poisoning*, as reported by Heymann.‡

Jacob Astheiner, journeyman plasterer, aged sixteen, had suffered for many years from time to time, with lasting head-

* Allgemeine Zeitschrift für Psychiatrie, 1852, S. 262.

† Ibid, 1853, S. 525.

‡ Canstatt's Jahresbericht, 1865; Dritter Band, S. 31.

ache. Eventually, in the otherwise taciturn patient, were observed great vivacity and wantonness, and the ordinary symptoms of plumbism. A few days afterwards he ceased to answer any questions, and was unable to utter a syllable; there was also *agraphia*. A fortnight later his speech partially returned, and he spoke a few words very indistinctly, and would for many hours together cry out *Va-ater, Mau-auter*, and also *Hu-unger* with joyful, excited voice. This patient gradually but entirely recovered.

It will be observed that in some of the preceding cases, the subjects of them were lunatics or persons of weak mind; in my opinion, they are none the less valuable on that account; in fact, Broca's first two cases, the publication of which has given rise to so much discussion and research throughout the scientific world, were observed by that distinguished pathologist in an institution devoted to the treatment of the various forms of mental disease. Although aphasia is by no means a very common symptom in the insane, I cannot but think that the alienist physician possesses unusual opportunities for contributing to the solution of what still remains one of the most difficult questions in cerebral pathology.

Amongst British authors the earliest observations that have come under my notice are those of Crichton, who, in his chapter on Memory, mentions several cases bearing on the subject under consideration, from which I have selected the following:—

An attorney, in his seventieth year, having indulged in great venereal excesses, was suddenly seized with great prostration of strength, giddiness, insensibility to all the concerns of life, and every symptom of approaching fatuity. When he wished to ask for anything, he constantly made use of some inappropriate term; instead of asking for a piece of bread he asked for his boots, and if these were brought he knew they did not correspond to the idea he had of the things he wanted, and therefore he became angry, yet he would still demand some of his boots or shoes, meaning bread. If he wanted a tumbler, he would ask for a chamber utensil, and if it happened to be the said chamber utensil he wanted, he would ask for a tumbler, or a dish. He evidently was conscious he used wrong words, for when the proper expression was spoken by another person, and he was asked if it was such a thing he wanted, he always seemed aware of the mis-

take, and corrected himself by adopting the appropriate expression. This gentleman was cured of his complaint by large doses of valerian and other proper remedies.

Crichton also mentions instances of persons who suddenly found that they could not remember their own names, the most striking being that of an ambassador at St. Petersburg, who, on calling at a house where he was not known by the servants, and wishing to give his name, could not remember it; and turning round to his companion said, with much earnestness, "For God's sake tell me who I am."

Abercrombie, whose work on cerebral disease is perhaps more quoted than that of any other British author of the past generation, has recorded numerous cases of cerebral loss of speech, of which I can only briefly allude to the following, which are in direct opposition to the recent theories as to the seat of the faculty of articulate language.

A man, aged fifty, who had been for some time subject to cough and bloody expectoration, was seized with frontal headache and some confusion of thought, which appeared chiefly in a tendency to misapply words; he soon lost the sight of the right eye, his speech became indistinct, and, after some time, inarticulate; and he died in two months from the commencement of the cerebral symptoms. At the autopsy there was found, at the *posterior* part of the left hemisphere, a soft and vascular cyst, containing about two ounces of a thick, colourless fluid, coagulable by heat, and exactly resembling the albumen of an egg; the cerebral substance around the cyst was softened, the brain in other respects being healthy.

A man, aged sixty, after some premonitory symptoms, was suddenly seized with *left hemiplegia and inarticulate speech*, his intelligence, however, being unimpaired. At the end of a month he was suddenly seized with perfect loss of speech, which was followed in a few hours by coma, from which he did not recover. The substance of the brain was found healthy, except at the outer part of the right hemisphere, where there was a considerable portion in a state of complete ramollissement. The pia mater on the upper part of both hemispheres appeared thickened, and was remarkably vascular; there was considerable subarachnoid effusion, and both lateral ventricles were distended with fluid.

The same author mentions the case of a child, four years and a half old, whose articulation had been for many months very imperfect, and at whose autopsy the corpora olivaria,

the crus cerebelli, and the tubercula mammillaria were found in a state of cartilaginous hardness; other parts being sound.*

Baillie relates the history of a gentleman, aged fifty-six, who, after an attack of right hemiplegia, lost the recollection of the words of his own language, except a very few (yes, no, Mr. Reed, yesterday), which he employed on all occasions, and pronounced with the greatest distinctness, exhibiting none of that thickness in his pronunciation which is so common in paralytic patients; his countenance expressed a full share of understanding, and he seemed to comprehend all that was said to him. In the account of the necropsy, the brain and its membranes are described as perfectly natural in appearance, but the left vertebral artery was enlarged, and its coats had become opaque; there was considerable effusion into the lateral ventricles, which probably coincided with the occurrence of the coma which set in a few days previous to his death.†

Bright describes a case of dextral paralysis with aphasia, occurring in a man aged 63, who had a few years before married a woman much younger than himself; he had also for several years been the subject of an open ulcer in the leg, which had healed up six or seven months before the paralytic seizure. After death there was found softening of the middle and posterior lobes of the left hemisphere, the anterior lobe being unimpaired. The vessels at the base of the brain, particularly the carotid and its branches, were very much ossified, and the mitral valve was converted into an irregular bony mass. There is a very beautiful plate appended to the description of this case, from which it would appear that the disease commenced in the cortical portion.‡

Dr. Copland, who has written *de omnibus rebus et quibusdam aliis*, has, of course, not omitted to speak of lesions of speech; our great medical lexicographer, however, seems only to have viewed them as motor defects, and not as due to the loss of an intellectual faculty; and the only case which is given in detail in his work on apoplexy, is clearly one of disease at the origin of the lingual and glosso-pharyngeal nerves, and not an instance of lesion of the faculty of articulate language.§

In the *Dublin Quarterly* for February, 1851, Graves has re-

* On Diseases of the Brain and Spinal Cord, pp. 176, 273, 431.

† Medical Transactions of the College of Physicians, Vol. iv.

‡ Reports of Medical Cases, Vol. ii., p. 177.

§ Copland on Palsy and Apoplexy, p. 37.

corded a most singular instance of amnesic aphasia, limited to substantives and proper names. The subject of it was a Wicklow farmer, fifty years of age, who, after an attack of hemiplegia, was affected with an incapacity to employ nouns and proper names, he being able in other respects to express himself well. This defect was accompanied by the following singular peculiarity: that he perfectly recollected the *initial letter* of every substantive or proper name for which he had occasion in his conversation, though he could not recall to his memory the word itself. He consequently made for himself a little pocket dictionary of the words in most general use, including the proper names of his children, servants, and acquaintances, and during a conversation he would look in his dictionary till he found the word he wanted, keeping his finger and eye fixed on the word until he had finished the sentence, but the moment the book was closed, the word passed out of his memory and could not be recalled, although he recollected its initial, and could refer to it again in his dictionary when necessary. The learned Dublin professor, in his clinical lectures, has recorded two most interesting cases, where loss of speech was at first the only morbid symptom, but he does not dwell on the pathology of this singular affection; and, strange to say, although the cases recorded are typical instances of aphasia, he seems to imply that in loss of speech the defect may lie in the glottis rather than be the result of cerebral lesion!*

Sir Thomas Watson relates a remarkable case of a gentleman, who had a sudden fit of apoplexy, for which he was freely bled, and who on the third day was apparently quite recovered. On the fifth day, after a long conversation, he suddenly lost the thread of his discourse, became confused, and misappropriated words—for instance, wishing to say “camphor,” he called it “pamphlet.” After a few days the right side of the body became paralysed, and he died at the expiration of a fortnight from the commencement of the attack. At the post mortem, an abscess was found at the upper part of the left hemisphere, in the centre of which was a small fibrous tough mass of dull red colour, the coagulum doubtless of blood effused at the period of the apoplectic seizure.†

Dr. Todd mentions several instances of hemiplegia with aphasia, the paralysis being, with one exception, always on the right side. In one case only the post mortem appear-

* Clinical Medicine, p. 433.

† Practice of Physic, Vol. ii., p. 511.

ances are given, with Dr. Todd's usual attention to details. The hemiplegia was explained by disease of the central ganglia, but there was likewise considerable softening (colourless) of the white substance of the hemisphere, where were numerous small vessels in a state of fatty degeneration, and also an abundance of compound cells. The grey matter was not stated as being affected.* Dr. Todd's attention was evidently never given to the special consideration of speechlessness as a symptom of brain disease, and in one case, he says, "it was evident that very grave lesion had occurred, sufficient to inflict so severe a shock on the brain as to destroy the power of speech."

Dr. Forbes Winslow, in his remarkable chapter on the "Morbid Phenomena of Speech," has entered with considerable detail into the question of the cerebral localisation of that faculty, illustrating the subject by allusion to a number of highly interesting cases, from which I have selected the following for brief allusion.†

A gentleman had an attack of apoplexy, consequent upon extravasation, the effects of a rupture of one of the cerebral vessels. He rallied, had a second attack, and again recovered. At the expiration of eighteen months a third attack ensued, when he became hemiplegic, and entirely lost his speech, and died in two months, having never uttered a vocal sound. At the examination, a small patch of softened brain was found in the pons Varolii, surrounding a clot which had been deposited on that ganglion. The other portions of the cerebral mass were apparently in a healthy condition, with the exception of some of the vessels being closed by deposits of bony matter.

A patient suffering from cancer of the uterus, which completely prostrated her, was suddenly seized, in the middle of the night and without any known cause, with an almost complete dumbness, which only enabled her to say "yes, yes," to all questions, whether they were contradictory or not. She retained possession of her intelligence, for she was neither paralysed nor insane. If she was requested to write what she had to communicate, she traced an assemblage of letters on the paper to which no meaning could be attached.

A clergyman, whilst reading the Litany, became suddenly

* Clinical Lectures on Diseases of the Brain, p. 247.

† On Obscure Diseases of the Brain, p. 497.

speechless, without losing his consciousness, and was obliged to leave the church. He continued in the same state for an hour, being perfectly sensible of everything that was going on about him, and was able to write on a piece of paper a request that a certain physician should be immediately summoned. Two days after the loss of speech he was in a state of apoplectic coma, in which he died, no autopsy being permitted.

A gentleman, after many premonitory warnings, fell down in a fit, described as a combination of epilepsy and apoplexy, and for two days his life was in imminent danger; he, however, partially recovered, but with an inability to give anything like a clear expression to his wishes, what he said being quite unintelligible. He was able to pronounce words with great clearness, but they were sadly misplaced and transposed. By adopting the course of writing down what he said, and then re-arranging the words in their proper order, his family were able clearly to understand his wishes. This state of brain and impairment of speech continued with slight intermission for nearly a fortnight, accompanied by acute pain in the occipital region. Abstraction of blood by cupping was followed by a decided mitigation of the symptoms. Mercurial purgatives were administered, the head was shaved, and counter-irritation applied behind the ears. At the end of five days he was able to converse coherently for a few minutes, but if he continued in conversation beyond that time, he again began to jumble and misplace his words. Minute doses of bichloride of mercury, in combination with tincture of cinchona, were subsequently administered with the greatest benefit, and in the course of a few months he entirely recovered.

Dr. Winslow adds that in fifty-four cases he has detected after death a considerable amount of disease of the anterior lobes without being accompanied during life with any perceptible loss of speech. In one case of softening of the cerebellum, the principal symptom was great perversion of the faculty of speech, without complete loss of power over this function, the anterior lobes being free from all organic alteration. In another case a large encysted abscess was discovered at the base of the brain, which produced during life the most singularly remarkable modification of the faculty of speech, the patient's misplacement of words being at times most eccentric and grotesque, and the power of articulation seeming occasionally to be entirely lost. In a third case a tumour

of a malignant character was found in the cerebellum, which produced complete loss of speech.

The next observation to which I shall direct attention is one of extreme interest from its exceptional character, being a case of impairment of the faculty of articulate language from *disease of the spinal cord*, reported by Dr. Maty in the third volume of the London Medical Observations and Inquiries.

The Count de L., aged 35, was overturned in his coach from a high and steep bank; the accident was followed by no head symptoms, and he soon recovered from the effects of a severe contusion of the left shoulder, arm, and hand, and went through the fatigues of a military campaign. Six months afterwards, however, weakness of the left arm occurred, with difficulty of articulating certain words. Some months later the difficulty in speaking and in moving the left arm increased; the limb eventually became withered, and he could scarcely utter a few words, and those only monosyllables. During all this time the Count continued able to read and write, and spent his time in the most abstruse subjects, and up to the period of his death, which occurred four years after the accident, he preserved to the last the highest intellectual power. The description of the autopsy is too minute to admit of its being given here in detail; the medulla oblongata was enlarged by one third, and more compact than natural, and the spinal membranes were very tough. The spinal marrow itself had acquired such a solidity as to elude the pressure of the fingers, and to offer the resistance of a callous body, this peculiarity being most apparent in the cervical portion.

The following unique case of aphasia, resulting from the rupture of a vessel within the orbit, was lately communicated to the Norwich Pathological Society by my colleague, Dr. Copeman, who had extracted it from the private notes of the late Mr. Norgate.

Sarah Hase, æt 29, a spare, slender woman, in good general health and in the last stage of pregnancy, was seized with an acute, lancinating pain in the left side of the head and temple, extending deep into the orbit; the eyelids became swollen, and she experienced a throbbing and constant "boiling" just above the brow. At five o'clock the following morning, with very little effort and before the midwife could arrive, she was delivered of a child. Soon afterwards the pain and distension caused by pressure on the ocular globe

from behind became almost intolerable; and it now became quite evident that a vessel of some size at the back of the orbit had been ruptured. Leeches were now plentifully applied around the part, followed by cold lotions. In the evening of the same day the eye was noticed to be protruding and nearly immovable from pressure, and it was now that for the first time Mr. Norgate noticed a remarkable hesitation in answering questions, although she was perfectly conscious; she occasionally employed one word for another, mistook letters, and dropped syllables in articulating words. The next day the eyeball was more perfectly fixed, the agony was extreme, and although the cornea was then clear, the retina was amaurotic, and the iris quite insensible to light, vision of course being lost. She now confused her words so much as to be quite unintelligible to those around her; she tried to make it understood by signs that she wished to write, and in attempting to do so she invariably made use of parts of words. Omitting the daily details, suffice it to say that after scarification of the conjunctiva and other appropriate treatment, there was a little relaxation of pressure; the globe was less distended, and the power of expressing herself began to improve; in proportion as absorption proceeded, so the power of language increased, and in a few days she could articulate and converse as well as ever. This patient told Mr. Norgate afterwards that she comprehended everything that was said during the period in which she had been unable to express herself.

The above case is, I think, unique of its kind, although a somewhat similar one is quoted by Van der Kolk, from the "*Gazette Medicale de Paris*," of September 5th, 1857, where it is stated that in consequence of a wound, a bony splinter from the os frontis above the left eye compressed the anterior part of the hemisphere, subsequently causing loss of speech, which faculty was completely regained after the removal of the fragment by the trepan.

I would call attention to the fact that the inference to be drawn from these two cases is not in favour of the theory of M. Broca, but rather favours the system of Gall, who located the faculty of language in that part of the anterior lobes which lies above the orbital plates; for it was clearly this region that was the seat of pressure in both cases, and not the neighbourhood of the so-called Broca's region.

The next case I shall mention was also observed by a

Norwich pathologist—my colleague, Mr. Cadge, having at a recent meeting of our Pathological Society, related the following case of a cerebral tumour sufficiently large to take the place of the left anterior lobe, speech continuing unaffected to the last.

C. D., æt. 50, was a strong stout man, remarkable for his physical power and invariable good health, and moderately temperate in his mode of life. Although not an ill-tempered or violent man, he had a habit of wrangling with, and abusing those in his employ; he was addicted, in fact, to a kind of chronic vituperation, which meant little, but sounded a good deal, for he had a loud voice and a copious vocabulary. The first indication of his illness that attracted notice, was that he ceased to upbraid, and became suspiciously good-humoured and quiet; this change in his manner occurred only six months before his death. The next symptom was violent but intermitting headache; at first it was almost confined to the back of the head, afterwards it passed over to the forehead, but was never restricted to one or other side of the head; he also had a constant singing in the left ear. His sight soon became defective, and about three months before death he became totally blind, large retinal extravasation being observable by the ophthalmoscope. As the sight failed, his mind and faculties began to waver, and he became droll and almost childish. At no period of his illness was there any continued paralysis; on one occasion he staggered and fell whilst walking, but quickly recovered. Other than this, there was no loss of power or sensation; his voice was clear and his articulation distinct. Six months from the commencement of his illness he suddenly became apoplectic and comatose, and died in twelve hours. Necropsy:—The cerebral membranes were adherent; there was nothing like excessive congestion in any part, nor was there more than a little excess of fluid either in the ventricles or at the base of the brain. There was some trouble in peeling off the membranes from the convolutions; this being as much or more due to over softness of the latter than to unnatural adhesion; nothing like inflammation or active congestion was present. Hidden in the left anterior lobe of the brain was a tumour of about the size of a hen's egg; the tissue around it being considerably softened, it was not easy to ascertain very precisely its exact limits and relations. It seemed to occupy the left lobe chiefly, encroaching slightly on the right across the corpus callosum; behind it pressed on the corpus striatum,

and was visible in the anterior cornu of the ventricle; in front it encroached upon the grey matter of the convolutions, but did not reach the surface; below it rested on the root of the orbit and on the olfactory nerve. The tumour itself was of softish consistency, not unlike tubercular matter; in some parts it had almost a gelatinous aspect, and under the microscope nothing was visible but a multitude of compound cells and free nuclei, and a few large corpuscles, but no fibrous structure whatever.

After stating that the inference was that the tumour was malignant, (its rapid development encouraging that view,) Mr. Cadge asks, why a tumour in the anterior lobe should cause blindness, as there was no pressure on, or inflammation around, the optic nerves, nor were the optic thalami or tract at all interfered with? He also asks how it is that there was neither aphasia nor paralysis of the right side? This last question of Mr. Cadge I shall endeavour to answer in a subsequent part of this essay, when analysing the mass of evidence I have collected with the view of testing the value of the different statements that have been made as to the seat of the faculty of speech.

Mr. Dunn, whose researches in physiological psychology are so well known, has published several very interesting cases of loss or impairment of speech, to one only of which I shall briefly refer.

A young girl, aged eighteen, accidentally fell into a river, from which she was extricated in a state of suspended animation; prompt assistance being rendered, sensibility was restored, and she eventually recovered. Ten days afterwards she was seized with a fit, lay in a state of complete stupor for nearly four hours, on rallying from which, it was observed that she had lost the power of speech and hearing, and was also deprived of the senses of taste and smell, and for three months her only medium of communication with the external world were the senses of sight and touch. About three months afterwards, an incident occurred in the family which roused her sensibility and suddenly brought into play one of her suspended powers—the faculty 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 suddenly ejaculated, “Wh—a—t’s the mat—ter?” From this time she began to articulate a few words, but she neither called persons nor things by their

right names. Nine months later, under sudden and overwhelming emotional excitement, she fell into a state of insensibility of many hours' duration, but which proved critical and sanatory, for she awoke in possession of her natural faculties and former knowledge; her speech was restored, but she had not the slightest recollection of anything that had taken place during the interval of the twelve months that her faculties had been suspended.

Beyond all doubt the observer who has done the most in this country to elucidate the subject of cerebral loss of speech, is Dr. Hughlings Jackson, who, in the London Hospital Reports for 1864, has given the details of thirty-four cases of hemiplegia with loss of speech. Of these cases, the paralysis was observed thirty-one times on the right side and three times on the left; the heart was more or less affected in twenty instances (valvular disease existing in thirteen cases); in four cases there was loss or defect of smell. I much regret that want of space will not allow me to dwell on this most interesting communication; there are, however, two cases in this collection to which I must briefly allude. One is a case of *aphasia with left hemiplegia* occurring suddenly in a gentleman 64 years of age, who fourteen years before had received a very severe blow in the right occipital region, which had left him ever afterwards deprived of the power of smell and taste. In the other case the patient, although continuing aphasic, had recovered the power to *swear*; which Dr. Jackson explains on the principle, that ejaculatory expressions are prompted by the emotions and not by the will; he also considers that oaths and similar interjectional expressions are not parts of speech in the broad sense in which the words that form them are, when used to convey intellectual propositions.

The Medical Journals of the last few years contain a variety of interesting cases, to the salient points of which only a passing allusion can be made.

In the "Medical Times" of July 9th, 1864, a case is recorded of a man aged twenty-one, who was admitted into the Middlesex Hospital, under Dr. Stewart, with *left* hemiplegia without loss of speech, the attack having been preceded by choreic movements of the left arm and leg. A week later he was suddenly seized with paralysis of the *right* side, with loss of speech, consciousness however being retained. After death both middle cerebral arteries were

filled with fibrinous plugs and semi-coagulated blood; at each end of the Sylvian fissure was a mass of diffuent brain substance, of about the size of a walnut.

In the "British Medical Journal" for Dec. 14, 1867, Dr. Bastian reports a case of right hemiplegia with aphasia, where after death the arteries at the base of the brain were all notably diseased and contained large white calcified patches at intervals; the left hemisphere showed very many patches of red softening, which were almost always strictly confined to the grey matter of the convolutions, the principal patches of softening being met with in the *third or inferior frontal convolution*, in a portion of the adjacent ascending parietal,* near its commencement, and in the superior frontal. The great mass of the white matter of the hemisphere appeared healthy and of normal consistence, as also the central ganglia, pons, and medulla. The heart was large, weighing eighteen ounces; the aortic valves and a portion of the great tongue of the mitral, showed a very early atheromatous change.

One of the most recent observations that has fallen under my notice is that recorded by Dr. Simpson, in the "Medical Times" of Dec. 21, 1867, as a case of "*Extensive Lesion of the left inferior frontal convolution of the cerebrum without aphasia.*" W. M., æt. 62, was admitted into the Gloucester County Asylum, in February, 1857, and had been subject to epilepsy from his early youth; he never had an apoplectic attack as far as could be ascertained, nor had he at any time suffered from loss of speech. During the ten years he was under observation in the asylum, he had no brain symptoms beyond those ordinarily associated with epilepsy, no paralysis, and no impairment of speech. He died in November, 1867, of bronchitis. Autopsy:—Calvarium thick and heavy; cranium unsymmetrical, being elongated in the left oblique diameter. Dura mater non-adherent and healthy; arachnoid opaque throughout, but more particularly on the upper parts of both hemispheres; pia mater normal. The grey matter was somewhat atrophied, of firm consistence, but paler than normal; white matter also atrophied, and the interspaces and ventricles filled with serum. Both orbital divisions of the frontal lobes were indented, from undue prominence of the upper walls of the orbits. On the left side, and implicating the *posterior part of the third or inferior frontal convolution*, a large depression existed which appeared

* I presume Dr. Bastian means the posterior or ascending frontal.

to be the remains of an apoplectic clot; it was of irregular shape, about an inch and three-quarters in its antero-posterior, and an inch and a half in its transverse diameters; extending internally to within five lines of the olfactory bulb, and in front to within an inch of the anterior margin of the hemisphere; it was deepest in the centre, where it measured half an inch from the general line of surface. The brain tissue was stained of a brownish-yellow colour, and there was considerable puckering, with induration round the margins of the depression. Microscopical examination showed distinct feathery crystals of hæmatoidin. The cortical substance was greatly thinned, being reduced to a mere line in the centre of the depression; the island of Reil appeared healthy, and the other parts of the brain presented no great deviation from the normal standard; the cerebral arteries were slightly atheromatous. Weight of encephalon, 42½ oz.

These three cases, the leading features only of which I have just described, are of extreme interest from the circumstance that in all of them the clinical history is completed by a minute and well recorded description of the post mortem appearances. The first case is remarkable from the fact that the patient possessed the power of speech in its perfect integrity whilst the paralysis was confined to the *left* side; but, having to a great extent recovered from this first attack, a sudden invasion of *dextral* paralysis was immediately followed by loss of speech. The second case, that of Dr. Bastian, will be claimed by M. Broca and his advocates in support of their theory as to the localisation of speech, for there is a high probability that the diseased action may have commenced in the third or inferior frontal convolution and its neighbourhood, as the greatest amount of softening was observed in this region; another interesting feature in the case was the existence of complete hemiplegia with only disease of the convolutional grey matter to account for it. This remarkable communication, which is written in Dr. Bastian's usual clear and lucid style, is well worthy of a careful study, being pregnant with original thought and the results of philosophical research. The case of Dr. Simpson is unique, and cannot be dismissed without a word of comment. Here there was disease of the posterior part of the third frontal convolution, (the exact region of Broca,) without any impairment of speech. I have already mentioned cases of aphasia where the frontal convolutions were all described as healthy, and I shall have

others to record, which have occurred under my own immediate observation; but hitherto we have had no example of the converse condition, that is, *disease of the third frontal convolution without lesion of speech*, and it has even been stated that there is no case on record in which positive disease of this precise spot existed with integrity of speech.

Our northern neighbours, the Professors of the "modern Athens," have contributed their full quota to this branch of pathology, Dr. Sanders and the late Dr. Scoresby Jackson having each recorded a case with autopsy, more or less corroborative of Broca's theory.

The subject of Dr. Sanders' case was a woman aged 43, who was admitted into the Royal Infirmary at Edinburgh, on November 16th, 1865, with incomplete paralysis of the right side, defective speech, and loss of the memory of words. Without following Dr. Sanders in his detailed account of the clinical history of this case, suffice it to say that two days after admission the patient complained of pain in the *left* leg, with impaired motion and anæsthesia; signs of obstruction of the left femoral artery shewed themselves, and gangrene of the corresponding limb occurred, from the effects of which she died about two months from the date of her admission. Autopsy:—The right hemisphere presented no lesion. On carefully examining the left hemisphere, *the posterior part of the inferior left frontal convolution*, where it forms the anterior margin of the fissure of Sylvius, together with a small portion of the adjoining orbital convolution, was observed to be collapsed, and depressed below the natural level. The flattened and depressed portions felt soft and fluctuating to the touch, and on cutting into the softened part, the grey matter was found to be thinned off from within, and the white cerebral substance was completely softened and eroded, presenting an appearance like dirty cream. The softening extended inwards to the immediate neighbourhood of the corpus striatum, without, however, involving it. The other convolutions of the anterior lobe were not affected, but there existed a separate softening near the posterior extremity of the fissure of Sylvius. The corpora olivaria were normal, and there was no other lesion of the encephalon. There was no embolism in the cerebral arteries,

but there was a little thickening in the wall of the artery of the left Sylvian fissure.*

In Dr. Scoresby Jackson's case, the subject of it, James A., 48 years of age, was thrown from a van and received a wound on the left temple. This accident did not prevent him from working, but he ever afterwards complained of a pain in the head; and two months after the injury he was suddenly seized with right hemiplegia and aphasia, and died seven weeks later. Autopsy:—The heart was of natural size, and on the mitral valve were numerous vegetations, and loose fibrinous masses. The vessels at the base of the brain were atheromatous at several points, and there was embolism in some of the branches of the left middle cerebral artery. There was softening of a considerable portion of the left hemisphere, being most advanced in the island of Reil and in the posterior part of the third frontal convolution, the anterior end of the same gyrus not being involved.†

In the report of the Edinburgh Asylum for 1866, Dr. Skae speaks of a case of right hemiplegia where the patient had lost the power of all articulate speech, except the words "aye, aye," and at whose autopsy, an effusion of blood was found in the *left posterior lobe of the brain*.

Dr. Gairdner, of Glasgow, has published an extremely interesting case of epileptic (?) seizure, followed by a speechless and somewhat cataleptic state, without coma or evident paralysis. There was recovery of the intelligence to a considerable extent, but with continued aphasia, death ensuing in ten weeks during an epileptic paroxysm. This patient, although unable to express himself in writing, was able to copy handwriting set before him with tolerable accuracy. The necropsy, which was made with great care, revealed no cerebral lesion whatever beyond general and diffused congestion of the vessels of the pia mater, the smaller ones of which were surrounded with slight granular deposit.‡

Medical science is indebted to the physicians of the "sister island" for much valuable information communicated by them

* Since the above lines were written I have been favoured with a private communication from Dr. Sanders, in which he tells me that his later dissections tend to show that in speech palsy it is the island of Reil that is at fault rather than Broca's convolution. For the details of cases published by Dr. Sanders in support of this view, see *Lancet* for June 16th, 1866, and *Edinburgh Medical Journal* for August, 1866.

† *Edinburgh Medical Journal*, February, 1867.

‡ *Glasgow Medical Journal*, May, 1866.

during the last few years, in reference to cerebral loss of speech.

In the *Dublin Quarterly* for February, 1865, is a valuable paper by Dr. Banks, in which he mentions the following very curious case.

A gentleman, now aged 54, was eight years since attacked with paralysis of the right side and aphasia. At first the loss of speech was complete, but after twelve days he could say a few words. Before his attack he was a ripe scholar, and had taken much pleasure in reading the best classical authors; but when his stock of words had increased so as to enable him to converse a little on ordinary subjects, it was observed that his memory had quite failed him with respect to Greek and Latin. For six years he continued without improving to any considerable extent, but still he was gradually acquiring new words. For the next two years his progress was more rapid; he laboured hard, and almost learned over again all that he had forgotten, so as to be able to read his old favourite classical authors once more. The accomplished Trinity College Professor adduces this case to prove that, even in aphasia with paralysis, the mind may remain unclouded, and the power of speech, even after years, may be re-established.

At the annual meeting of the British Medical Association held at Dublin last August, I had the pleasure of reading a paper on the "Localisation of the Faculty of Speech," after which an interesting discussion took place, in which Professor Gairdner, Drs. Lyons, Hayden, Lalor, Gibson, &c., took a part, and some extraordinary cases of the sudden loss of speech, and of the intellectual results that followed, were mentioned.

During my visit to Dublin, Dr. Lyons kindly called my attention at the Hardwicke Hospital to a case of aphasia occurring as a complication of cerebro-spinal arachnitis.

The subject of it, John Oyden, a delicate boy, aged eleven years, was admitted into the hospital on May 30th, being reported three days ill. His symptoms were those of well marked cerebro-spinal arachnitis, of pure type, and intense degree. The head was much contracted; the face was flushed; the pupils were dilated; and the patient complained of much acute pain in the head and back of the neck, which extended down the spine for a considerable distance. On June 3rd, the usual eruption made its appearance. On June 25th the patient became affected with aphasia, the right side being at the

same time paralysed. He remained in this state for many days; the only words he was able to utter were "day, day," which was his answer to all inquiries. In the beginning of July he rallied a good deal and regained the power of speech, but on August 27th he again became the subject of aphasia, in which state he died.*

Dr. Popham, of Cork, in a very elaborate paper in the *Dublin Quarterly Journal*, mentions the following case, which he says bears on M. Broca's views.

Mary Murphy, aged sixty, was admitted to the Union Hospital with right hemiplegia and impaired speech. The memory of words was very defective, and the articulation confused; for "thank you, Sir," she said "fancy sell," and being asked what her husband, a pedlar, sold, she replied "procties and pudding pans," which Dr. Popham found out meant "brooches and bosom pins." She eventually died of pneumonia, when the following appearances were observed at the post-mortem examination. The heart was covered with fat; the mitral orifice was narrow, its margins ossified, and there were some vegetations on the auricular surface. There was considerable effusion under the arachnoid membrane. On careful examination of the left hemisphere, the convolution of Broca was softer in consistence than the neighbouring parts, and the remains of an apoplectic cyst, of the size of an almond, and empty, was situated close to the anterior third of the corpus striatum, and running parallel to its course.

I now arrive at the consideration of the labours of our American cousins, beginning with Dr. S. Jackson, of Pennsylvania, who records the following curious case.

The Rev. Mr. —, æt. 48, endowed with intellectual powers of a high order, of a sanguine temperament, with latterly a strong tendency to obesity, having exposed himself to the influence of the night air, received a check to the cutaneous perspiration. The next morning he awoke with a headache, and when a friend went into his room to enquire after his health, he was surprised to find Mr. R—— could not answer his questions. Dr. Jackson having been summoned,

* The above very meagre report of this remarkable case is taken from the *British Medical Journal* of September 28th, 1867; it is to be hoped, however, that Dr. Lyons will eventually favour us with a detailed account of this most interesting and exceptional case.

found the patient in full possession of his senses, but incapable of uttering a word; the tongue was not paralysed, but could be moved in every direction; all questions were perfectly comprehended and answered by signs, and it could be plainly seen by the smile on the countenance, after many ineffectual attempts to express his ideas, that he was himself surprised, and somewhat amused at his peculiar situation. The face was flushed, the pulse full and somewhat slow, and to the inquiries if he suffered pain in the head, he pointed to his forehead as its seat. When furnished with pen and paper, he attempted to convey his meaning, but he could not recall words, and only wrote an unintelligible phrase, "Didoes doe the doe." Forty ounces of blood were drawn from the arm, and before the operation was completed speech was restored, though a difficulty continued as to the names of things, which could not be recalled. The loss of speech appearing to recur in fifteen minutes, ten ounces more blood were abstracted, and sinapisms supplied to the arms and thighs alternately. These means were speedily effectual, and no farther return of the affection took place.

Dr. Jackson, in analysing this case, calls attention to the following facts. Firstly, sudden suppression of the cutaneous transpiration, succeeded by cerebral irritation and determination of blood to the brain: secondly, frontal pain immediately over the eye: thirdly, perfect integrity of the sensations and voluntary movements: fourthly, the general operations of the intellect undisturbed; ideas formed, combined, and compared; those of events, of time, recalled without difficulty: fifthly, loss of language or of the faculty of conveying ideas by words though not by signs; this defect not being confined to spoken language, but also extending to written language.*

Dr. Hun, of Albany, mentions the case of a blacksmith, æt. 35, who, before the present attack, could read and write with facility, but who had been labouring for several years under a disease of the heart. After a long walk in the sun, he was seized in the evening with symptoms of cerebral congestion, remaining in a state of stupor for several days. After a few days he began to recover from this condition, and understood what was said, but it was observed that he had great difficulty in expressing himself in words, and for the most part could only make his wants known by signs.

* American Journal of Medical Sciences, February, 1829, p. 272.

There was no paralysis of the tongue, which he could move in all directions. He knew the meaning of words spoken before him, but could not recall those needed to express himself, nor could he repeat words when he heard them pronounced; he was conscious of the difficulty under which he was labouring, and seemed surprised and distressed at it. If Dr. Hun pronounced the word he needed, he seemed pleased, and would say, "Yes, that is it," but was unable to repeat the words after him. After fruitless attempts to repeat a word, Dr. Hun wrote it for him; and then he would begin to spell it letter by letter, and, after a few trials, was able to pronounce it; if the writing were now taken from him, he could no longer pronounce the word; but after long study of the written word, and frequent repetition, he would learn it so as to retain it and afterwards use it. He kept a slate, on which the words he required most were written, and to this he referred when he wished to express himself. He gradually learned these words and extended his vocabulary, so that after a time, he was able to dispense with his slate. He could read tolerably well from a printed book, but hesitated about some words; when he was unable to pronounce a word, he was also unable to write it until he had seen it written; and then he could learn to write as he learned to pronounce, by repeated trials. At the end of six months, by continually learning new words, he could make himself understood pretty well, often, however, employing circumlocution, when he could not recall the proper word, somewhat as if he were speaking a foreign language, imperfectly learned.

Dr. Hun infers, from what precedes, that there is a portion of the brain connected with language or the memory of words, as distinct from the memory of things and events; and that there is another portion on which depends the co-ordination of the movements of articulation. It will be observed that in the above case, the impression made on the acoustic nerve was not sufficient for rendering the articulation of the word possible, but that it was necessary that an impression should be made upon the optic nerve. Dr. Hun asks whether this can be explained by the supposition of a more intimate connexion between vision and articulation, or by the fact that the impression on the acoustic nerve is transient, whilst that on the optic is more permanent.*

Quite recently, Dr. Austin Flint, in giving an account of six cases which had fallen under his observation, expresses

* American Journal of Insanity, April, 1851.

his strong dissent from the doctrine of the localisation of the faculty of speech in the left hemisphere, and he thinks that anatomical researches may show why lesion of speech is a more constant accompaniment of dextral than of sinistral paralysis.

Having in the preceding pages endeavoured to give a brief sketch of the labours of the principal authors in various parts of the world who have written on the subject of loss or impairment of the faculty of articulate language, I shall, in the next number, give the results of my own personal experience, as embodied in a series of important cases which have fallen under my own immediate observation.

(To be continued.)

