ON
PARAPLEGIA.

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UNDER the title of Paraplegia I wish to be understood to include that species of palsy in which both sides of the body are affected, in contra-distinction to hemiplegia, where only one side is deprived of sensation or motion, or both. The term paraplegia frequently occurs in the writings of the ancients, and has been employed by different authors in various senses, but by none exactly in the acceptation I have just defined. — Thus Hippocrates denominates all paralytic affections occurring after apoplexy, paraplegiæ. Aretæus uses the word to denote a remission of sensation or motion in some one particular part. Boerhaave says paraplegia is a palsy of all parts below the neck. Van Sweeten gives a similar definition. More modern authors confine it to paralytic affections of the lower half of the body. Now as far as my observations have enabled me to judge, none of these definitions are strictly correct, as the

affection may be confined to the feet and ankles without extending higher up the lower limbs, while in the same individual there may be a similar affection of both hands. It will, I conceive, meet every variety of case which occurs, if we define paraplegia to be a paralytic affection of both sides of the body, whether that be partial or general, in opposition to hemiplegia, in which the affection is confined to one side.

Paraplegia has generally been considered as dependent on some morbid action existing in the vertebræ or spinal canal, and producing more or less pressure on the spinal marrow, especially in the lumbar region ; and no doubt many instances occur where the seat of the disease is in some part of the spinal marrow, or its membranes. But symptoms very closely resembling those produced by morbid affections of the spinal marrow, will occasionally be found to take place in chronic diseases of the brain and its membranes. This form of paraplegia dependent on some morbid alteration of structure in the encephalon, does not appear to have been particularly mentioned by authors on diseases of the spine.

In August 1814, I addressed some observations in reply to a review of Mr. Baynton's works, which were published in the *Edinburgh Medical and Surgical Journal* for January 1815. In the course of my remarks I adverted to this affec-

tion, and related the particulars of some cases, with the appearances on dissection. In these instances both spinal marrow and brain were examined, having been led to investigate the latter from the absence of disease in the former parts.

In the sixth volume of the Transactions of the College of Physicians, published in the year 1820, there is a valuable paper by the late Dr. Baillie, entitled "Some Observations on Paraplegia in Adults." In this paper he states his belief that this form of paralytic affection had considerably increased in this country, although he could not assign any reason for it. He further states, that "in adults, when the spine has not suffered from outward violence, paraplegia most commonly depends on a disease of the brain itself." This assertion is hardly warranted by any direct proof adduced by the author in the paper in question, as only one dissection is given where there was extensive effusion in the membranes and ventricles. It is true, that in some additional observations published in Mr. Wardrop's edition, he states "Besides the account of the dissection published in my former paper, I have heard, from the most undoubted authorities, of one case where tumours were found in the brain, and of another where a large quantity of water was found in the ventricles of the brain, together with some in the theca vertebralis. To these" he says, "I may add a third case, on the best authority, in which

many of the arteries of the brain were found ossified, and a large quantity of water effused between the membranes and the brain."

From a long conversation which I had with the author in the beginning of the year 1822, I have strong grounds for presuming that these latter observations, which bear date April 1822, were partly in reference to some cases and dissections which I named to the Doctor, as he at that time distinctly avowed that his belief in the seat of these affections being in the brain did not rest on any additional anatomical facts, but was the result of his own reason. He was not aware, before that conversation, that I had published the dissections above alluded to, illustrative of this point, and appeared much pleased to find that I had confirmed the opinions he had advanced, by actual examination of the brain and spinal marrow.

It is not then without good reason that I venture to call in question the propriety of assuming it as an axiom, that "paraplegia in adults most commonly depends on disease of the brain." I admit that it is an occasional and not unfrequent cause, and further I admit that where such a train of cerebral symptoms exist as are described by Dr. Baillie, we should probably not err in referring the mischief to the head; yet I feel confident that the conclusion is too general, and would therefore warn practitioners against too hasty an adoption of it, as no

doubt many instances occur in adults, wholly dependent on diseases affecting the spinal marrow. The subject is one of much interest and often involved in obscurity, requiring the most minute attention to every particular, more especially when the more manifest symptoms of cerebral affection are absent. Having for several years directed my attention particularly to affections of the brain and spine, it may not be unacceptable to the members of this Society to present them with the result of my inquiries, illustrated with some original cases and dissections.

Although in many of these diseases it may not be possible to form a very correct opinion during life, yet there are many circumstances which, if closely attended to, will enable us to form a tolerably correct prognosis.

Paraplegia dependent on the existence of disease in the brain, generally occurs at the middle or more advanced period of life than is usual in diseases of the bodies of the vertebræ, or their intervening fibro-cartilages. Its progress is more rapid than the slow insidious approach of symptoms from the latter diseases; the affection is more general, occasioning more or less paralysis of the upper and lower extremities, and this will often take place in a very few days from the occurrence of the complaint. This disease happens much more frequently in men than women. The gait of persons suffering from cerebral affection is peculiar, and

very different from that attendant on affections of the spine. It very nearly resembles the vacillating steps of a drunkard.—Such paralytic persons are incapable of walking in a direct line; the limbs are loose, and thrown forward with an exertion of the whole body; there is a great consciousness of feebleness in walking, and the greatest difficulty in turning round. The appearance of the eyes often much resembles those of a drunkard, particularly when the patient is at all excited or anxious. The above analogy to the staggering steps of intoxication is readily understood, if we consider that it is the temporary disturbance of the brain, from the congestion of its blood-vessels, that deprives the drunkard of the power of directing his steps, and for the time induces a state bearing the closest resemblance to paraplegia.

Sensation is more impaired than in spinal affections, when it will often remain perfect after a total loss of the locomotive powers. This impaired sensation is often peculiar, imparting an idea of some foreign body, as a leather glove or stocking being interposed. The patient appears to feel, if I may use the expression, through a false medium; the limbs are more wasted and flabby, without any spasmodic rigidity of the muscles, which so often occurs in affections of the spine. Although often accompanied with a torpid state of the bowels, aggravated no doubt by the impaired muscular power of the abdominal parietes, there has not, in

any instance that I have witnessed, been any train of gastric symptoms similar to those which so constantly attend affections of the spine, especially of the dorsal region. In some instances there is the additional confirmation of an impaired state of some of the external senses, accompanied with vertigo, a sense of weight on the head, and a general disturbance of the cerebral functions. As disease advances, the power of the brain in transmitting its influence to the extremities becomes more and more circumscribed. — Thus I have known a tubercular affection of the pia mater, in the first instance, cause a numbness and loss of feeling in the feet, which has gradually extended until all four extremities were completely paralysed, and the muscles concerned in respiration at length refusing their office, death ensued.

A very similar train of symptoms occurs in other diseases of the brain, particularly in cases of extensive membranous effusion from chronic inflammation, or effusion into the ventricles. In a case of *Fungus Hæmatodes* which I published in the third volume of the Society's Transactions, the same effect was produced, and I have since met with numerous cases of scrofulous tubercles in the substance of the brain, where the same phenomena were slowly induced, until suppuration has taken place, or the neighbouring membranes have become inflamed, when a fatal termination has rapidly ensued.

Whenever disease has proceeded so far as has been above described, one or more of the mental faculties has, in almost every instance, suffered, and no reasonable doubt can in such cases be entertained respecting the real seat of the disease. It is in slighter and more chronic cases that it is often difficult to form a correct opinion, yet to establish a correct diagnosis in such cases is of the utmost importance, both with respect to the prognosis we should form of the probable termination of the case, and with reference to the proper treatment to be adopted, that we may not subject the individuals to useless suffering from the application of caustic issues and setons to the spine, and the disappointment which would follow from their obvious inutility in such instances. In several of these cases, attention to the following circumstance has materially assisted me in forming a correct judgment; I am therefore induced to lay considerable stress upon it, although to some persons the opinion drawn from it may appear somewhat speculative.

It is well known that when a nerve is stimulated or injured in any part of its course, the painful sensation is referred by the percipient mind to the sentient extremity of such nerve; the familiar instance of the pain referred to the extremity of an amputated limb, may be adduced in proof of this. The exact reverse of this takes place when there is a partial paralysis arising from morbid

affection of the cerebral organs. Here the centre of the sensorial functions being impaired, it appears to be incapable of transmitting its influence to the extreme parts of the body, and thus the feet and hands gradually lose their sensation or power of motion, or both ; and in such cases if the nerves supplying the limbs be irritated, *they will convey the impression of such injury only part of the distance down the limb, about as far as the commencement of the paralytic affection.* I have repeatedly examined cases of paraplegia from affection of the spine, and in no one instance have met with the same phenomenon, which I have therefore been induced to consider as diagnostic of the paralytic affection being dependent on disease of the brain or its membranes ; which opinion has in several instances been confirmed by examinations after death, in which both brain and spinal marrow have been carefully investigated.

A fertile source of error relative to the seat of disease in cases of paraplegia, arises from the incurvated state of the spine, which frequently takes place in paralytic affections from morbid alterations of structure or pressure on the brain. When this exists it tends much to confirm the suspicion of the disease being in the spine, and many cases are treated on such supposition with issues and setons, to the great discredit of these remedies. The blame, however, ought not to attach to the remedy, but to its misapplication ; the fault consists in pre-

scribing for a symptom without sufficiently investigating its cause. It is true that in these cases the spine is much curved, but it differs materially from the angular curve produced by disease of the bodies of the vertebræ, *which is always more or less defined*. On the contrary, in these cases the whole spine is curved in the form of a half-hoop, in consequence of the debility of the muscles of the back, which are no longer capable of sustaining the weight of the trunk and viscera, and maintaining the erect posture. This is the state in which we frequently see weakly children during dentition, and it not unfrequently happens, that it is in them mistaken for affection of the spine, more especially if they have previously been able to move about and use their limbs.

The test by which I have been in the habit of trying these cases is at once simple and satisfactory. If a person with such a stooping or incurvated state of the spine be placed on a horizontal plane, the back will immediately and spontaneously be restored to its proper form without causing any pain or distressing symptoms, which would certainly be produced by any attempt at extension of a diseased spine. The state of the back in these cases is similar to what occurs during sleep or after death. It takes the direction influenced by the gravitation of the viscera and upper part of the body ; for be it remembered that the strength of the spine and of most other joints depends on the

power of the muscles : this is readily shown by dividing the tendons which pass over a joint, which will immediately become pliant and flexible. The same occurs in acute rheumatism, when the muscles are no longer under the control of the will, and the joints are consequently loose and powerless.

Paraplegia in adults is no doubt often produced by chronic membranous inflammation of the brain and spinal marrow conjoined, in which cases we find after death more effusion than natural in the upper part of the spinal sheath, in addition to effusion into the cellular tissue of the pia mater and ventricles of the brain.

Several such cases have been traced to long exposure to damp and cold, from lying in the open field, or in boats exposed to inclement weather. From these sources, I have known several officers and soldiers become more or less afflicted with paraplegia. Habitual intemperance has in other instances produced the same effect. Patients will often survive many years under such circumstances, and on examination after death, in addition to disease in the brain, more or less effusion into and chronic thickening of the membranes of the spinal marrow will be found. In such cases, I have remarked during life that the limbs have been more rigid, particularly the flexor muscles, than when the affection has been confined to the head.

Frequent and attentive observation of the spinal marrow and brain, connected with a minute and faithful record of the phenomena presented during life, will it is hoped clear up many of the obscurities which, it must be acknowledged, still envelope this interesting subject, on which it may be truly said, "*multum adhuc restat operis,*" and it may be added, "*et multum restabit.*"

With a view to contribute towards this desirable object, I shall subjoin cases and dissections illustrating some of the positions I have advanced. In the first place I shall mention some cases of paraplegia dependent on cerebral affection alone. I shall next contrast these with paralysis from disease of spine, and lastly I shall give the narrative of some cases where disease existed in the same individuals in both brain and spinal marrow. With respect to the first class of cases, I am well aware that in many instances similar and even more extensive morbid alterations of structure have been found in the brain, without any symptoms having existed during life to lead to a supposition of such disease.

There is perhaps no part of the body which exhibits greater variety of symptoms under disease than the brain. At one time we have a fatal termination from membranous inflammation, and so slight a degree of effusion as almost to elude the researches of the anatomist; whilst at another we

have immense effusion of water in the ventricles and entire surface, or even extensive abscesses in the substance of the brain wholly unsuspected during life. These discrepancies will perhaps occasionally admit of being reconciled ; but this is not the object of the present paper, which has reference more particularly to cases where there have been manifest symptoms of impaired nervous power during life.

In addition to the instances I have already recorded in the *Edinburgh Journal* and the *Transactions* of this Society, I have selected a few marked cases from my note book.

C A S E

OF PARAPLEGIA FROM DISEASE OF BRAIN.

A gentleman, aged thirty, who had suffered from scrofulous affection of the testicle and inguinal glands which had suppurated, complained of very intense pain in the head after exercise on a hot day. He had frequently suffered from headache, which was supposed to be connected with a very dyspeptic state of stomach, and studious sedentary habits. The pain was so intense and of such duration, that I advised him to lose blood by cupping, which afforded some alleviation, but he never entirely lost a sense of more or less uneasiness and weight in the head. After some days he com-

plained of a stiffness in his feet and ankles, and he tripped in walking. In about a week he had similar feelings in his hands, and he could with difficulty direct a pen. It now became apparent that serious mischief was going on in the brain, and very active measures were resorted to, but without avail. The paralytic affection extended up the lower extremities, so that he could only advance a step by throwing his limbs forward with an exertion of the whole body. Sensation was much impaired half way up his legs, and his extremities were cold and clammy. His upper extremities never entirely lost their motive powers, but he could with great difficulty feed himself, and his grasp was hardly to be felt. He could not distinguish the temperature or properties of any substance felt with his fingers, and on stimulating the median and ulnar nerves, he was not sensible of any pain much below the elbow. He had long complained of *muscæ volitantes*, and his sight now became permanently misty and imperfect. He had *tinnitus aurium*, and his memory and power of reasoning failed gradually. In about six weeks from the attack of severe pain in the head, he had two convulsion fits which left him deprived of consciousness for many hours. By active treatment, he was for a time roused, but in a few days became comatose and died.

On examination, the vessels of the dura and pia mater were very turgid—the convolutions on the

apex much flattened ; about five ounces of limpid fluid were found in the ventricles. A thick layer of yellowish lymph covered the pons varolii and optic nerves. The whole pia mater was studded with small tubercles like millet seeds ; these were particularly abundant on the middle lobe and basis of the brain. The cervical portion of the medulla spinalis was examined, but no disease detected, except a slight increase of fluid in the theca ; but it is probable that this flowed down from the ventricles in making the dissection of the brain. The peritoneal covering of the intestines had similar small tubercles beneath it, projecting towards the muscular coat. The mesenteric glands were enlarged, and some contained scrofulous matter. The lower part of the spinal marrow was not examined.

C A S E

OF ANÆSTHESIA FROM DISEASED BRAIN.

A young woman complained of impaired sensation in her hands, after sudden suppression of menstruation. It was accompanied with a flushed countenance and much pain in the head. She was bled largely which relieved the head, but she never recovered the proper sensibility in her fingers, which were affected with anæsthesia, the muscular powers remaining perfect. Her feet and legs were always remarkably cold ; she passed her urine with-

out consciousness at night, and she had very slight control over it during the day. She lived in this state between two and three years, at the expiration of which time she had a fit which left her hemiplegic on the right side. In about six weeks she had a second fit from which she did not recover.

On dissection much gelatinous deposit was found towards the basis of the cranium between the layers of the arachnoid, and the cellular tissue of the pia mater was loaded with fluid. Three scrofulous tubercles were found in the substance of the cerebrum, and one in the left lobe of the cerebellum which had suppurated. The surrounding medullary matter was unusually soft and pulpy. In the chest the lungs were found much diseased with very numerous tubercles. The cancellous structure of the bodies of the vertebræ was filled with cheesy deposit, and they could be easily cut with a knife; but no perceptible change had taken place in the spinal marrow and its membranes.

CASE

OF PARAPLEGIA AFTER SLIGHT CONCUSSION.

Major L. ætat. 38, an active, robust, healthy man, in November, 1824, was thrown from his horse in leaping a double fence, near Canterbury;

he fell on his back on a hard road, quite flat. He was slightly stunned for a few minutes, but soon recovered, shook himself, and rode on. He thought nothing of the accident, and took no kind of precaution as to medicine or diet, and lost no blood. About six weeks after this occurrence he was exposed to cold and wet in a shooting party, and on the same day, 18th January, 1825, he first found a slight difficulty in deglutition, and he could not close his teeth with sufficient force to divide his meat (some tender venison) which led him to suppose it tough. He applied the following day to the surgeon of the regiment, who treated him for a common sore throat and cold. The difficulty increased the following day, and he now perceived a thickness and peculiarity in his speech, which made it difficult for him to be understood. On the 23d he first felt a numbness about his feet, and a sense of weakness in his legs, which impeded his walking, particularly in going up and down stairs. This latter symptom rapidly increased from day to day, extending higher up the limbs, until the whole of the lower half of the body was paralysed. His arms also now became affected, and he was unable to assist himself in turning, and could not grasp any body to make any sensible impression. He was bled once, but the heart's action was so enfeebled that it was not deemed prudent to repeat this. The case was considered as an affection of the lumbar spine, and blisters and mustard poultices were extensively employed: ammonia and

infus. armor. comp. and other stimulants, were given internally. He continued, however, to get rather worse than better, and was brought up to London from Canterbury, and placed under my care.

I was first called to him on the night of the 3d of February, and found him in a most deplorable state after the fatigue of the journey. His lower extremities were completely palsied, he not having the slightest power of varying their position. The muscles were flabby, and much diminished in bulk; his bladder and rectum were paralysed; the muscles of the loins and abdomen were nearly powerless, so that he had no power of supporting himself in a chair; his hands were so feeble, that he could not hold or direct a pen, and when he attempted to shake mine, I could scarcely distinguish his utmost degree of pressure. On cross-questioning him respecting his head, he said he never had pain in it, but acknowledged that he occasionally felt giddiness, and his sight was so far impaired, that he could not see to read above two or three lines without the whole becoming confused. On looking up, and throwing his head at all back, he also felt a peculiar sensation in the head and upper part of the neck. His speech resembled a person with bad venereal affection at the upper part of the soft palate and fauces. His power of deglutition was so much affected, that he was some minutes in getting down a single spoonful of fluid; if he attempted to swallow faster, it returned through his nose; solids

he could not swallow at all. His pulse was exceedingly small and contracted, slow and labouring, as if the heart's action was influenced by the general paralysis, and his respiration was feeble and difficult. He was a good deal distressed by a secretion of mucus, which collected in his throat, and which he could with great difficulty raise. One great source of distress, and which disturbed his rest at night, was the constant painful weariness in his limbs and loins, which required his position to be very frequently varied, and from his being a heavy stout man, this was rather difficult to accomplish. This pain appeared to depend on the great pressure the integuments sustained in consequence of the total paralysis of the muscles, which afforded no elasticity or resistance to the continued dead weight of the limbs. It was much increased also, at the time of my first seeing him, by the very tender state of the loins and nates, which were in a state of ulceration from the blisters and mustard cataplasms. Sensation in the integuments of his limbs was rendered morbidly acute; at the same time that it was not correct, giving a sensation of leather intervening.

On viewing all the circumstances of this truly distressing case, I was led to conceive that the seat of the mischief was in the head, and that there was actual inflammatory action of the membranes at the basis of the brain, and medulla oblongata. Cupping glasses were applied behind the ears, and about ten ounces of blood removed. After

the removal of the blood the pulse improved, became fuller and more distinct. Considering that there was certain evidence of disease in the head, the treatment consisted in repeated small bleedings from behind the ears and nape of the neck, with antiphlogistic diet and mild aperients. He was placed on one of my double-inclined beds, which allowed his position to be varied without much difficulty, and enabled him to pass his fæces, &c. I directed that his limbs should be gently rubbed, and passive motion given to all his joints daily. The first symptom of amendment was the return of power in the bladder and rectum, except when he took active aperients. The extreme restlessness and distress from lying next abated; in the space of a few weeks he was able to move his toes occasionally, but they were not obedient to his will at all times. A seton was made in the nape of the neck, and kept actively open with stimulating dressings. His progress was very slow, but uniform; his speech and power of deglutition were restored in about six weeks; his arms next acquired strength. He was then able to move himself round in the bed, and the muscles of his loins became stronger, so that he could sit up in his chair. His lower limbs became more firm and muscular, their bulk increased, and by degrees he could move his ankles, and next his knees. After several months the seton was closed, and conceiving that the spinal marrow participated in the mischief, long strips of blisters were placed down the spine. At

one time, when he appeared rather at a stand, strong camphorated mercurial ointment was rubbed in down the spine. This soon affected his constitution, inducing languor and increased debility, with rather a wasting of flesh ; it was discontinued, and he immediately made more rapid strides. The mercury was evidently of use in exciting the absorbents, although it disordered his general health. At another time, galvanism was tried for a short time, but it appeared to excite too much, and to cause a sense of weight and giddiness in the head. He continued gradually to gain ground, and after some months, with the assistance of a sort of large go-cart, which supported him under the arms, he was able to throw his limbs forward, and make some progress in walking. Still however the muscles, which connect the pelvis with the lower extremities were for a long time not sufficiently strong to sustain the whole weight of the body.

I have lately (May, 1827) received a letter from him, stating that he is in perfect health, and able to walk with the assistance of crutches, and to stand upright without any support. I entertain no doubt of his ultimate and perfect recovery, for which it is but justice to add, he is in great measure indebted to his steady perseverance in the means which were recommended, and especially to his own even temper and well-regulated mind. Never during a long and necessarily tedious attendance, did a murmur escape his lips at the pri-

vations he was subjected to, and the pain he daily suffered. He always received me with cheerfulness and most gratifying confidence. He had early made up his mind to the worst, and every advancement, however minute, afforded him fresh grounds for gratitude and hope.

Independently of any interest, which it was impossible not to take in such a patient, the case afforded much matter for speculation. The early progress of the paralytic affection, commencing with the powers of mastication and deglutition, previously to the limbs participating, coupled with the manifest affection of the sight, giddiness, &c. which has been above stated, clearly pointed out the seat of the mischief to be in the brain and medulla oblongata. The treatment pursued was very simple, consisting in repeated small bleedings, with a view to keep the vessels of the head empty; active counter irritation in the nape of the neck; a strictly regulated diet, and attention to the digestive organs.

I have another case at present under treatment, in which there cannot, I think, be any reasonable doubt of the brain being the seat of disease. The following are the particulars of the case, extracted from my note book.

CASE

OF PARAPLEGIA FOLLOWING CONCUSSION OF THE
BRAIN.

Richard Dovey, ætat. 28, a carpenter by trade, was admitted into St. Bartholomew's Hospital, May 27th, 1826, with paraplegia affecting his lower extremities, bladder, and rectum. He had been previously in the Westminster Hospital, where issues were made in the loins, from which he had not derived any benefit. He had been into the country for his health from the period of his quitting the Westminster Hospital.

At the time of his admission his walk was very peculiar, resembling a drunken man. He could not direct his steps, could not turn without holding something, and at times his knees failed him so completely that he fell. I examined him naked, but could find no disease about the spine. The appearance of his eyes was peculiar, which, with other circumstances, led me to suspect that the disease was in the brain. On questioning him about any sense of giddiness, or pain in his head, he did not *at that time* complain, and stated nothing respecting any former injury. Still, however, the peculiarity of his gait, the appearance of his eyes, and the numbness he felt in the integuments of the lower half of the body, induced me to refer the complaint to the head. He was ordered to be

cupped behind the ear, and a seton was made in the nape of his neck. His bowels were regulated with blue pill and compound colocynth extract. Under this treatment he evidently improved.

Some weeks after his admission, I cross-questioned him very particularly as to the commencement of the complaint, and whether he had ever sustained any injury in the head. It now appeared that he had received a severe blow on the left temple, in October, 1825, which stunned him for some minutes. He took no precautions after this injury, and sought no advice. About two months after this he first felt a stiffness in his feet and ankles, which gradually increased upwards as high as his loins. His sensation became impaired, conveying a feeling of leather being interposed. His feet and legs were cold, particularly his right leg, which he dragged more than the left. He had much difficulty in discharging his urine and fæces, et in venerem minime habilis fuit. He had repeatedly fallen from the failure in his knees, and had occasionally lost all consciousness. He recollected having suffered a good deal with frequent pain in his head after the blow, but he heeded it not, and continued to work on. His sight was evidently affected when he attempted to fix his attention to any object for some minutes. The right side was more affected than the left. Repeated small bleedings from the temples, and an active seton, constituted his principal treatment, combined with low diet and mild aperient medi-

cine. Under this plan he slowly improved. At one time tartar emetic ointment was rubbed into the scalp, which produced a copious crop of pustules. This appeared to expedite his recovery at first, but on repeating it, after some interval, it produced so much general febrile excitement that it was desisted from. He continued slowly, but steadily, to advance in the increasing firmness in his step, and in regaining his proper feeling, until December, 1826, when he had a severe attack of dysentery, which greatly reduced him. He is at the present time (May, 1827) still an inmate in the Hospital. His feeling is now nearly natural, and he can direct his steps in a straight line, and is now quite free from all feeling of pain or giddiness in his head.

The following may be considered as a case of cerebral derangement producing impaired muscular action in the inferior extremities:—

William Blakey, æt. 15, was admitted into St. Bartholomew's Hospital July 20, 1826, on account of a paralytic affection of the lower extremities.

About five years ago the operation for cataract was performed on both eyes, the vision of which had been impaired from birth. Inflammation followed the operation in the right eye, which was destroyed. Vision remained nearly perfect (and much better than it had ever been before the operation) in the other eye for a year, when that

also became affected with inflammation, and in a month subsequent, notwithstanding active remedies were employed, vision was completely lost. During this time he had great pain in the head, to which he has been subject ever since. For some time previous to last December the head-ache had increased, and his lower limbs now became very weak. He complained of shooting pain in them when he endeavoured to walk, and his legs were involuntarily drawn across each other. These symptoms have been gradually increasing in severity up to the present time (July). He has now so little power over the motion of the lower limbs, that he is unable to walk or stand upright without danger of falling, his knees involuntarily bending under him, and his feet crossing each other. He complains of great pain and heaviness in his head; his tongue is white and coated; bowels constipated, and their secretions of a bad description; and there is a degree of irritability and fulness of pulse. The head was shaved, cold lotions applied, and leeches to the temples; calomel and jalap were given to regulate the bowels.

July 28.—The tartar emetic ointment was rubbed over the whole scalp, and it brought out a full crop of pustules; it occasioned much constitutional disturbance and fever. He also took Pil. Hyd. gr. iij. Rhei gr. ij. omni nocte.

August 16.—The symptoms were somewhat re-

lieved, the head-ache was less, and the power of the limbs increased. The ointment was again applied, followed by large pustules, which ulcerated.

30th.—There was some improvement, but he still complained of great pain in the head; the bowels were indolent, and the secretions depraved; his pulse was still irritable and full. He now took Pil. Hydrarg., Ext. Coloc. c. ā gr. v. omni nocte, and leeches were applied repeatedly to his temples.

September 9.—There was now a very marked benefit. His head was much less painful; he could walk alone tolerably well; the pulse was more natural, and the bowels regular, &c. The repeated use of the leeches was continued, and he is now (October 12) quite free from head-ache. His health and appearance are much improved, the power of the limbs is considerably increased, and he now walks tolerably firm and steady.

He quitted the hospital soon after this report was drawn up by the gentleman who attended him, and after being absent about six weeks experienced a return of pain in the head, accompanied with similar failure in his limbs. This was again relieved by repeated small bleedings from the head.

I shall next, by way of contrast, select a case of

palsy from chronic affection of the spine, which proved fatal, and was minutely investigated after death. This case was particularly interesting to me, from the various opinions and conjectures which were formed during life.

CASE

OF PARAPLEGIA FROM DISEASE OF THE SPINE.

Mr. R. P. a very corpulent, but active, healthy man, aged sixty-six, was thrown from his horse in Gray's-Inn Lane, and struck his sacrum against the pavement. He experienced very slight pain or inconvenience at the time, and paid no attention to himself. Many months after, he felt a difficulty in throwing his leg over his horse in mounting, and about the same time he was apt to trip against any slight inequality of ground, from his inability to raise his feet and measure distances correctly. This tripping and failure in his legs slowly but regularly increased until the motive powers were entirely lost in the lower extremities. Considering the case as connected with the fall, the loins were cupped and freely blistered; the blistering caused much irritation in the surrounding integuments, and a succession of painful boils formed, to the number of forty or fifty, many of which deserved the name of anthrax, and required to be freely opened to give exit to the sloughs.

Warm sea-bathing and friction were next resorted to, but without benefit. The paralytic affection continued slowly to advance upwards, the muscles of the abdomen and thorax, and latterly those of the upper extremities, lost their power, and became flabby and wasted. For some time after the extensor muscles had lost their power of action, the flexor muscles were obedient to the will. The bladder and rectum were not at all paralysed, except latterly, when purgative medicine was given, at which times he could not always command his sphincter ani. His general health during the whole progress of the case, which occupied above two years, scarcely suffered. His head was clear and quite free from pain, his respiration free, and his digestive powers perfect. From the entire failure in his muscles and want of elasticity, he suffered much latterly from the weight of his body and limbs, often requiring change of posture. Sensation was perfect to the last, even to the extreme points of his toes. He gradually became more feeble, and at length the muscles concerned in respiration failing, he was unable to speak except in the lowest whisper. He appeared to die from the want of muscular power to draw in his breath. To the last ten minutes of his existence, (and he breathed his last in my presence,) his intellect was perfect; not a single faculty, except that of speech, was impaired. During his long illness various medical men were consulted, and the general impression on the minds of his physicians

was, that this was one of the cases described by Dr. Baillie.

From the total absence of all evidence of affection of the head, from the sensation remaining perfect to the last, from the very gradual progress from below upwards, and from the known fact of his having received a severe jar at the lower part of the spine, I was induced to entertain throughout an opposite opinion, and was led to refer the mischief entirely to the spine. Permission was granted by the family to institute an examination of the spine and the rest of the body, of which I gladly availed myself.

Appearances found on Dissection of Mr. R. P.

The viscera of the chest and abdomen were all healthy. The bodies of the last two lumbar vertebræ were unusually prominent, and their intervening fibro-cartilages were broader and more prominent than usual. Several of the lower dorsal vertebræ were connected together by bridges of newly formed bone, passing from the edge of one body to that of the contiguous vertebra, particularly at the sides of the bodies near the transverse processes. This affection has been described by Poupart, who says “ Une végétation osseuse se forme sur le corps même des vertèbres, comme une espèce de fourreau qui les lie et les soude ensemble ainsi qu’un vieil arbre prend une nouvelle écorce.”—It is an affection not uncommonly met

with in the horse. On sawing open the vertebral canal, considerable bloody effusion and great congestion of vessels was found exterior to the membranes, between them and the bony canal. Ulceration of the posterior surfaces of the bodies had commenced at several points in the lumbar and dorsal spine, at which parts the posterior longitudinal ligament was absorbed, and a thick yellowish deposit covered the ulcerated parts. On slitting up the dura mater rather more fluid than natural escaped, and the pia mater was very vascular. The medulla spinalis itself was unusually hard. On making a section of the bodies of the vertebræ and their cartilages, the cellular structure of the bodies was much condensed, and they exhibited a very unusually dark appearance. When cut open, they resisted a very strong scalpel, which could not be made to penetrate in the least. The ulceration had in places extended to some depth. The intervening fibro-cartilages were totally altered in structure, having lost all elasticity, and much resembled rotten leather in colour and appearance. This appearance extended more or less through all the lumbar and dorsal spine. In the head a small quantity of fluid was found in the ventricles, perhaps not more than natural. In the basis of the brain the arachnoid had a slight milky appearance, and there was considerable venous congestion in the cerebellum. From the appearances exhibited by this examination, there cannot be a reasonable doubt that the paralytic

affection was referrible to the effects of chronic inflammation in the spine, which principally caused a morbid alteration of structure in the bodies of the vertebræ and their cartilages; the affection of the spinal marrow and its membranes being most probably dependent on the inflammatory action going on in the contiguous parts.

This case affords an interesting illustration of the progress of chronic disease of the spine; and the dissection offered a most satisfactory explanation of the phenomena which occurred during life. It forms a complete contrast to the cases of paraplegia from affection of the brain. As it is my intention at some future time to publish some remarks on diseases of the spine and spinal marrow, I shall not now give any further illustration of affection of the spine alone; but shall conclude with some cases in which disease occurred in the brain and spinal marrow, in some of which the symptoms depending on the different parts affected were well marked.

CASES

OF DISEASED SPINE AND BRAIN.

H. S. aged 16, had enjoyed good health until February, 1816, when he was seized with giddiness, temporary loss of sight, and great tremor of the

head, accompanied with severe pain. At the commencement of the attack every object appeared as red as blood. In a few days he perceived his right foot and leg to be benumbed, and he had much difficulty in moving them. He gradually recovered the use of the limb, and was able to walk about, but was liable to occasional fits, and once fell in the street, and remained in a state of insensibility for some time. On recovering he found that the sight of his right eye was much impaired, being hardly able to discern light from darkness. He consulted an eminent oculist, who ordered electricity, which aggravated the pain in his head, and increased the dimness of vision. Subsequently to this seizure he had experienced many slighter attacks, which increased in frequency to the time of his consulting me, in the month of November, 1816. At that time he rarely passed a night without being suddenly awakened from his sleep, screaming and in great alarm, with violent spasmodic contractions of the muscles of the back of the neck, causing a retraction of the head, almost similar to opisthotonos. Occasionally during the day he had similar affections. He was very drowsy, much distressed with tinnitus aurium, and complained of constant weariness. The pupils of both eyes were much dilated, that of the right permanently. His neck was constantly stiff and rather awry. He walked with great caution and some difficulty, and was much afraid of tripping, which jarred his head, and brought on spasms in the muscles. His general

health was much impaired, his pulse full and frequent, countenance flushed and expressive of great anxiety, tongue furred, and bowels costive. His speech was affected with a stutter when he attempted to speak fast, but when not hurried or alarmed it was distinct. His mental faculties were not impaired, with the exception of his memory of localities, which caused him to forget in a few minutes where he had placed any thing; a circumstance which was remarked in consequence of his business, that of a pawnbroker, requiring the especial exercise of this faculty. His recollection with regard to circumstances and facts was unimpaired, and he gave a very clear account of the origin and progress of complaint.

From this history it was very clear that there was disease in the brain. He was repeatedly cupped from the head, and applied cold washes. His bowels were freely opened with calomel and jalap. He derived much benefit from this plan; the attacks became less severe, and not so frequent, and his head felt much lighter. The right eye remained amaurotic. A seton was made in his neck, and mercurial pills were ordered night and morning to affect the mouth. As soon as ptyalism was produced, the mist began to clear away from his eye. He was kept under the influence of mercury for six weeks, at the end of which time his sight was so far restored that he was able to read large print. He lost his nocturnal seizures, and felt himself free

from all complaint in the head. As he was much reduced in strength, he went into the country, and bore his journey to the neighbourhood of Coventry without suffering. His seton was still kept open. I heard from him soon after, when he expressed himself as rapidly regaining his strength, and feeling quite well, with the exception of a permanent rigidity of the muscles of the neck, causing the head to be awry. He had been in the country about three weeks, when he one day tripped, and fell in crossing a room. From this time he began to complain of pain in his right side and back, with cramps in his stomach, and his legs again failed him. He was removed to London, and I saw him early in July. The pain he described as shooting round in the course of the costal nerves, which being accompanied with pain in the præcordia, and irregular muscular action in the lower extremities, induced me to suspect that disease had commenced in the spine. On stripping him, my suspicions were confirmed by finding a curvature of the dorsal spine occupying about three vertebræ. The form of the chest was much altered, and his respiration was very difficult. His health was much deranged, bowels irregular, and his locomotive powers were greatly impaired. I ordered him to remain quiet, in a recumbent posture, and endeavoured to improve the state of his health. Issues were made on each side of the affected spine. He was much distressed with severe cramps in the muscles of his legs and thighs, and with pain in his side. After

some time his health rather improved, and he lost his cramps. He was occasionally attacked with diarrhoea, which greatly reduced him. The curvature in the back did not appear to increase, but the sixth and seventh ribs appeared to have fallen in, and he lost all power of using his intercostal muscles; below the eighth rib the arched form of the chest was preserved. Towards the close of this distressing case his breathing was so difficult that he could not articulate. On the 23d of December his sufferings terminated.

On examination the scalp was found remarkably vascular, the glandulæ Pacchioni much enlarged, and altered in structure. The arachnoid membrane milky, vessels in the pia mater very turgid with blood. A firm, almost cartilaginous tumour adhered to the membranes, which were condensed at the upper and anterior part of the right hemisphere, and penetrated to some depth in the substance of the brain. A similar tumour was found on the under side of the posterior lobe, and a very large one occupied about two-thirds of the right lobe of the cerebellum. The ventricles contained about twelve ounces of water. The right lung was universally adherent. A large abscess occupied the posterior mediastinum, at the bottom of which the bodies of two of the vertebræ were found nearly destroyed; several of the neighbouring vertebræ were soft, and the cancelli contained curdly matter. The ribs were very porous,

and could easily be cut with a common knife; four of them were separated from their attachment to the spine, and were ulcerated as far as their tubercles.

The history and progress of this case, coupled with the examination after death, was very interesting. The early symptoms were unequivocally produced by the disease in the brain, the progress of which was however suspended, and the symptoms relieved, by the measures which were pursued. The subsequent attack of scrofulous disease in the spine, was attended with all the usual symptoms which are known to accompany that affection. They were, however, quite distinct from those dependent on the primary cerebral disease, which never again manifested themselves, notwithstanding the existence of such very extensive mischief, the progress of which appeared to have been wholly suspended by the occurrence of the spinal affection.

Mary Phillips, aged 12, had been ill for two years. The first symptom remarked by her parents was a projection of the dorsal vertebræ, which took place very rapidly and without any accompanying affection of the spinal marrow. She was admitted into St. Bartholomew's under the care of Mr. Lawrence in the summer of 1825. Issues were made in the back, and she was discharged, as it was supposed, cured.

She was re-admitted in January, 1826, under my care, at which time her general health was much impaired, and she complained of a dragging of the right leg and frequent cramps in the flexor muscles. Rest and attention to her health greatly improved her at first, but she afterwards remained nearly stationary for some time, until she was attacked with fever, which was followed, whilst still maintaining the recumbent posture, by paraplegia affecting her lower extremities and bladder. Issues were again opened above and below the curvature in May, and her recovery from this time was very rapid. The use of her limbs was quite restored by the end of June, and at each visit she expressed herself as going on well and daily gaining strength. She was quite free from cough, her digestive functions were well performed, and she complained of no pain.

She continued thus until the 22d of August, when she had slight head-ache, which continued through that and the following day, and on the 24th, at six, p. m. she was suddenly seized with a fit much resembling hysteria, crying and screaming violently. On this state subsiding, she became quite torpid and insensible. When I saw her the following morning, she remained insensible, her eyes were half closed and conjunctiva very vascular, and her pupils were insensible to variations of light and shade; her pulse frequent and hard. She

was cupped largely, her head shaved and cold washes applied. A large blister was put on the nape of the neck, and five grains of calomel were ordered to be given every six hours. Her bowels had been moved with calomel and jalap, and the discharges were dark and offensive. The following day she was more sensible when roused, but was very impatient when touched. She knew me, and mentioned me by name. Leeches were applied to the temples, and the calomel was continued. On the Monday she had passed many greenish stools ; her mouth appeared drawn to one side, but she could move all her limbs freely. She knew me when I spoke to her. Her mouth was evidently under the influence of mercury. She was ordered to desist from the calomel, and to take minute doses of sulphate of magnesia.

From the commencement of the attack I had predicted a fatal termination ; and from having met with several similar cases, suspected that there were tubercles or some organic mischief in the head. She gradually sunk, and died on the Tuesday morning.

She was examined a few hours after death. In the head, a slight milky appearance was found on the surface of the arachnoid, and extensive effusion into the ventricles. The arachnoid and pia mater were much thickened and agglutinated where they

enter the ventricles at the foramen of Bichat. The fifth ventricle contained a turbid fluid. The infundibulum was much distended, and the brain was very thin and transparent at this part. The pineal gland was converted into a vascular bag, containing transparent fluid, and was larger than natural. In the basis, lymph was deposited between the arachnoid and pia mater on the middle lobes; and on attempting to remove these membranes, the substance of the brain was torn, and portions came away adhering to the membranes. It was very vascular at this part, and softer than natural. There was a similar deposit on the left lobe of the cerebellum. Three hard tubercles of the size of large peas were found in the left lobe of the cerebellum near its surface, and a similar tubercle of a larger size was found in the centre of the tuber annulare. On removing the spinous processes of the vertebræ, matter was found between the bony canal and its proper membranous lining in the dorsal region, and some slight adhesions existed between this membrane and the theca. A large abscess was found in the posterior mediastinum communicating with the diseased vertebræ, two of which were carious, with some loose detached pieces surrounded by matter. Not the slightest attempt at reparation had taken place. The lungs were adherent, but not otherwise diseased, and the viscera of the abdomen were healthy.

This case presents many very interesting cir-

cumstances for consideration. In the first place, it affords an illustration of the possibility of angular curve rapidly taking place from disease without inducing any affection of the spinal marrow. It proves the difficulty of deciding respecting the probability of cure when there are no nervous symptoms to guide the practitioner. Next, the occurrence of symptoms of affection of the spinal marrow coming on while the patient observed the strictest rest, and the ready subsidence of such affection under the use of active issues, notwithstanding it did not appear that any reparative efforts had been made. Lastly, the existence of so much disease in the brain, unaccompanied by any symptoms until within a few days of the fatal termination. The paraplegia which existed for a short time, had the usual characters of that affection, when induced by disease of the bodies of the vertebræ: there was no loss of sensation, and the loss of motion was not complete, the flexor muscles being affected with frequent spasms. Had this been connected with the state of disease in the brain, I conceive that the symptoms would not have yielded as they did.

This case affords a useful lesson in teaching us not to rely too much on our powers of discrimination, and is a powerful illustration of the extent to which, under some circumstances, disease will go on even in so important an organ as the brain, without causing the slightest disturbance of the functions of that part.

The facility with which the mouth was affected by the calomel was also deserving of notice, as it is in general very difficult to effect this under any acute disease of the brain, more particularly with children.

C A S E

OF DISEASE OF SPINE, AND TUBERCLES IN THE BRAIN.

During the summer of 1821, I was requested to see a patient in Dr. Roberts's ward, who had suffered for a considerable time from fixed pain under the left breast, for which she had been leeches and blistered, and a seton was ordered to be applied, which was the cause of my being desired to visit her. She was about 20 years of age, and her catamenia were very irregular. On inquiring into her case, it appeared that her general health had been greatly disordered for some time. She complained of an indescribable sense of languor, and there was an extreme degree of anxiety and restlessness about her, much of which was attributed by the nurse to temper. She suffered from constant pain in her head; she had a great sense of stricture at her stomach, was incapable of digesting any food, and her breathing was so difficult, that it might with more propriety be called panting, her alæ nasi working as in a patient labouring under severe asthma.

On tracing the direction of the pain, it distinctly took the course of two of the costal nerves, and on examining the corresponding vertebræ the muscles were much wasted, the integuments had a peculiar doughy feel, and were slightly œdematous, and there was great tenderness on pressure. I entertained no doubt of the existence of disease in the spine, and recommended that immediate attention should be paid to it. The following day, her head became worse, and by night she was delirious, in which state she continued for ten days, when she died. During the last week, she had all the characters of a patient with bad typhus fever, she passed her fæces involuntarily, and her bladder was palsied, requiring the use of the catheter. For some days before her death, she never attempted to move hand or foot, and was perfectly insensible to all external impressions.

On examination, many tubercles were found in a state of suppuration in the substance of the brain and near its surface, and the pia mater was loaded with serum. In the chest the lungs were found studded with tubercles. Behind the pleura and on the surface of the bodies of the vertebræ, lymph and a peculiar cheesy secretion were thickly deposited. Suppuration had taken place behind the root of the left lung, and two of the ribs, exactly corresponding with the seat of the pain, were ulcerated at their articulations with the vertebræ. Considerable disease existed in the ver-

tebræ and canal, and entire absorption of the intervertebral cartilage had taken place between two of the vertebræ.

In this case, although there was such extensive disease in the spine and brain, there was no paralytic affection, until within a few days of her death. She had complained much of pain in her head, but was quite sensible and particularly sensitive. In several similar cases I have known large tubercles to exist in the brain, without inducing any symptoms, until suppuration or membranous inflammation have taken place, when they speedily terminated with every marked character of disease of brain.

The following case occurred very recently, and affords a good example of the difference between the symptoms dependent on affection of the spine, and those arising from cerebral disturbance.

George Davis, aged 3, whose mother had died consumptive, and whose father was at the time in a mad-house, was brought into St. Bartholomew's, having totally lost the use of the lower half of his body. On inquiry, I found that the child had been considered healthy, until about five weeks before its admission. The first circumstance which had been remarked was, that the child, from having been remarkably cleanly in its habits, constantly wetted itself and passed its fæces without

warning. Soon after this the right leg failed in walking, and the child fell. The following day the left leg dragged, and in the course of two more days, the lower half of the body was paralytic. At the time of its admission, there was total loss of sensation and motion, and, further, a loss of the power of regulating the temperature, so that considerable vesications had formed on the child's knees and legs, from lying in a person's lap before a small fire. The belly was very tumid. The child had a constant cough, with very frequent respiration, and, when not sleeping, was incessantly crying. On examining the spine, there was no particular projecting part, but the whole was much arched, from the wasted state of the muscles. The child was obviously in so hopeless a state, that little was ordered for it, but as far as possible to administer to its comfort. About a week after its admission, marked symptoms of inflammation of the brain came on. The following day there was strabismus, with the mouth drawn down, and loss of speech. The eye constantly half closed, and pupil fixed. Constant restlessness, with the hands picking, and apparently conveying food to its mouth. Repeated convulsions closed the scene. The treatment was active, but perfectly unavailing.

On dissection, the head presented all the marks of recent active inflammation. The ventricles were large and distended with fluid, the convolutions

much flattened, and the pia matter loaded with fluid. In the basis, there was a small tubercle under the membranes, just over the left crus cerebelli. The upper part of the medulla spinalis and the medulla oblongata were much firmer than I ever recollected to have felt, well deserving the appellation of endurcissement. The sheath of the spinal marrow was distended with fluid at the upper part. The whole spine was removed and carefully examined. On cutting away the spinous processes, a large tumour was apparent, covered by the membranes, and situated about the middle of the dorsal spine. The membranes were highly vascular above and below this part, but were nearly bloodless in this region. The tumour completely filled the canal so as to prevent any communication between the lumbar and cervical portion of the spinal sheath; below the tumour there were about ten drachms of fluid in the theca, and the cauda equina was quite flattened. On dividing the membranes, it was found that the tumour, a large scrofulous tubercle, occupied nearly the whole calibre of the medulla, which was almost entirely absorbed.

This most satisfactorily explained the entire loss of sensation and motion, and the want of power of regulating the temperature, as no doubt all the functions of the spinal marrow were destroyed below the seat of this disease. The symptoms connected with the subsequent affection of the brain were totally distinct and well marked.

I feel happy in having it in my power to present a very accurate drawing of the appearance of the tumour contained within the sheath, before the pia mater was divided. I beg leave also to submit to the inspection of the members the spinal marrow itself, with the tumour cut open, as seen in the accompanying preparation.

George Street,
May 20th, 1827.