ST. GEORGE'S HOSPITAL.

FRACTURE OF THE SPINE AT THE LOWER PART OF THE DORSAL REGION: DEATH FROM ANOTHER CAUSE, TWENTY-EIGHT WEEKS AFTER THE ACCIDENT.

Under the care of CÆSAR HAWKINS, Esq.

EDWARD M., aged 35, a labourer, was admitted on April 16th, 1858, under the care of Mr. Cæsar Hawkins. It appeared that, twenty-one weeks before admission, while at work on a tunnel in France, he fell a height of about twenty feet on a large stone, and a large mass of earth (said to weigh a ton) came down from the same height on his back, striking the lumbar region. Since the accident, he had had no sensation or power of motion in his back or lower extremities, nor any power over the bladder or sphincter ani. Large bed-sores had formed on the back and buttocks, exposing the spines of the sacrum and the right tuber ischii. There were also smaller sores on the right trochanter, on both heels, and on the right foot. He had been lying on a mattress all the time he was in France. At length, his desire to return home became uncontrollable, and he was carried on board ship in a covered couch, in which he was brought up to the Hospital from the docks.

He was put upon a water-bed, and ordered good diet with porter. The bed-sores were dressed with a solution of nitrate of silver, and covered with calamine cerate. The catheter was also passed daily, but only a very small quantity of urine was ever found in the bladder, as its irritability kept it constantly empty. The urine was very fetid and ammoniacal. His lungs were much loaded, and bronchial râles were heard all over. On this account, expectorant medicines were given.

He continued to improve for some time; the sores rapidly assumed a healthy appearance, and began to contract. At the end of the month, it is noted that sensation, which had been entirely absent above Poupart's ligament, had returned in both thighs as low as the knee, although it was still extremely imperfect. The cough also was better, but the irritability of the bladder persisted. During the month of May, the cough diminished considerably; the sores went on healing; and he appeared in a fair way of recovery. The bladder was now injected every morning with acidulated water (one drop of nitric acid to the ounce); squills and morphia were given at night, and mineral acids administered. The irritability of the bladder now diminished; and it is noted on May 27th, that "he is doing well in every way". On June 1st, however, while eating a hearty dinner, he died so suddenly that no one was aware of the seizure until he was dead. He had not been ailing in any respect previously, except that he had complained that morning of slight pain in the right side.

On *post mortem* examination, twenty-four hours after death, the body was found emaciated, and there were bed-sores on the back and heels; but these were quite superficial. The brain was watery; otherwise, both it and the medulla oblongata were quite healthy. The heart was large and flabby; all its cavities were empty of blood. The microscope showed considerable fatty degeneration of the muscular fibres. There were marks of old pleurisy on the left side. The bronchial tubes of both lungs were loaded with serum; otherwise, the lungs were healthy. The larynx was healthy. The stomach was full of food. There was a small abscess in the cortical structure of the right kidney, the pelvis of which was highly inflamed. The bladder was inflamed, fasciculated, and much contracted. The mucous membrane of the intestines was healthy.

The upper part of the spinal column and cord were quite natural. There was a fracture in the lumbar region, running behind through the laminae of the first two lumbar vertebrae on the left side, in the form of a fissure, which showed no trace of union. There was no displacement of the spinous processes. The fracture in front ran through the bodies of the last dorsal and two upper lumbar vertebrae, and there was considerable displacement both in the lateral and antero-posterior directions. A piece of bone had here been driven backwards, and projected into the spinal canal on the right side of the median line, below the termination of the cord, among the nerves of the cauda equina, none of which, however, were divided. The lower part of the cord appeared somewhat softer than the rest (though this was obscure), and there was a little purulent fluid in the theca vertebralis.

UNIVERSITY COLLEGE HOSPITAL.

INJURY TO THE SPINE.

Under the care of J. E. ERICHSEN, Esq.

[From Notes by F. B. JESSETT, Esq., House-Surgeon.]

WILLIAM C., aged 45, a labourer, was admitted on July 10th, 1857, under the care of Mr. Erichsen. It seemed that, ten days before admission, he fell from a ladder to the ground, a height of five or six feet. He was not at all stunned by the fall, but immediately lost all power of moving the limbs. He was carried home and put to bed, and it was then found that he had lost sensation over his whole body. A bottle of water was put to his feet, so hot as to blister them, without his being conscious of it. He passed water, however, voluntarily that day, and still retained power over the faeces up to the time of his admission. Since the accident, he had suffered much pain in the limbs and trunk. His mental faculties had been always quite clear, and he had no difficulty in swallowing or articulating. On admission, there were no external marks of injury in the back; but a slight prominence was observed at the lower part of the cervical region—not, however, more than would be accounted for by an unusually projecting *vertebra prominens*. He complained of much pain in the limbs, especially the arms. This was occasional, and radiated from between the shoulders. When his head was moved (which he could do himself, although imperfectly), he complained of pain in the back and shoulders. He had not the slightest power over his arms or hands; he could draw up his legs a little, enough to cross them when lying on his back. Sensation was about normal all over the body, but accompanied by slight numbness. His respiration was generally entirely diaphragmatic, but he could expand his chest on taking a deep inspiration. He spoke well and rationally. His appetite and digestion were good.

R Hydrarg. bichlor. gr. 1-12; decocti cinchon. ʒj. M. Fiat haustus ter die sumendus.

July 14th. His arms were still quite capable of motion. He moved his head a little more easily, and with less pain; and said that he thought he had more power over his legs.

July 16th. On the urine being examined, it was found to contain diabetic sugar.

July 27th. He continued as before; he had rather more power in the lower limbs, and was almost able to turn himself over by the muscles of the back and shoulders. Pulse 64, regular, tolerably full, and incompressible. He was ordered to have half a grain of extract of *nux vomica* three times a day.

July 31st. To-day, for the first time, power of motion was observed in his hands and arms. He sat up about half an hour. The extract of *nux vomica* was increased to one grain.

August 28th. He has now sat up for some hours daily, and complained of little pain, except in his hands and arms, which, from the little power he had over them, were obliged to hang more or less, and consequently became congested and painful. He was ordered to leave off all medicine.

September 22nd. By the help of the nurse, he was now able to move about the ward.

October 1st. Since leaving off the *nux vomica*, he had continued to make as much if not more progress than while taking it. He was now able to walk about the ward without even the aid of a stick, although his gait was still very uncertain. He had also recovered some use of his arms, which he could now raise nearly as high as his shoulders. His health was apparently very good, he having increased in weight considerably. He still complained, however, of a pain in his shoulders and limbs, and also of a degree of numbness in the latter.

October 14th. He still continued to improve, gaining greater strength in his limbs. He was ordered to begin again with a grain of *nux vomica*.

October 20th. He was discharged in much the same state, it being thought that he would improve more rapidly in the country.

CALCUTTA EYE INFIRMARY.

ILLUSTRATIONS OF SOME OF THE CURABLE FORMS OF AMAUROSIS.

By WILLIAM MARTIN, Esq., F.R.C.S., late Superintendent of the Infirmary: and Professor of Ophthalmic Surgery in the Calcutta Medical College.

IV. AMAUROSIS FROM PARALYSIS OF THE RETINA.

THERE are many cases of loss of sight, so rapid, and sometimes instantaneous, in their accession, and arising generally

from some special exciting cause, that we cannot attribute them to the agency of acute or chronic inflammation or congestion; nor will they own for predisposing cause any peculiar cachectic state of constitution. I have two instances of this affection, and can call to mind others which yielded to treatment, and therefore must be classed among the functional or curable forms of amaurosis.

CASE I. Gobindo Doss, aged 45, was admitted as an out-patient February 27th, 1856, with amaurosis. He said he lost his sight completely within two days; before which his only complaint was pains in the head. For three months he did not even see light; but after that, without treatment, vision began to return. He now saw features as through a mist.

REMARKS. Unfortunately, the patient would not remain in Hospital; but as he had begun to regain sight, in all probability the improvement would have continued, and progressed more rapidly under appropriate treatment. This case also affords a good instance of a fact which I believe holds good with anaurotic affections, as well as with many other diseases; namely, that there is a tendency of the disease to wear itself out as it were; to recovery, as in this instance, of the sensitive power of the retina, without any remedial measures whatever being used. We see that there existed total blindness for three months, after which time vision began to return, and slowly improved. This point particularly bore on the diagnosis of the case, as it is difficult to see how parts can become so completely restored as we see the retina does, in similar cases, if it had been subject to severe acute inflammation, or even great congestion; but we can easily imagine that, as we see to be the case in other parts of the body, the membrane, if paralysed, may, by the improvement of the general nervous vigour of the body or other coincident circumstances, regain its normal state.

CASE II. Eli Bux, aged 40, was admitted as an out-patient July 15th, 1856, with amaurosis, from the effects of lightning. A year previously he was struck. He fell down insensible, and remained in that condition for three hours. He lost his sight entirely. The past six months he had been feeble.

REMARKS. In this and similar cases, arising from the same cause—a stroke of lightning—which have come under my observation, there can be no doubt that the destruction of sight has been instantaneous; and from the known effects of that subtle agent upon all substances in creation, we may, without difficulty, conclude that it will at once arrest the action of the nervous apparatus, there being in no case which has come under my cognisance any previous plethoric or hyperæmic state about the organ.

We have, in both instances given above, the characteristic symptoms of a condition of the sensitive apparatus of sight, which we cannot attribute to the gradually developed agency of ordinary congestion or inflammation. There is a change in functional power which we can only place to the account of a suddenly developed and very active agent. This we may call a shock to some portions of the nervous centre, which influences the optic nerve; but it is to be observed that while the other effects of the shock are comparatively transient, the patient in most cases soon regaining the ordinary faculties of motion and sensation, the function of the special nerve of sight only after a considerable interval regains its normal power; but that it does so eventually in the greater number of cases I can state with confidence from my own experience; and I have every reason for thinking that there exists a tendency in the nerve to regain its power after a lapse of time, although it is difficult to say how mere want of exercise, independent of any special amelioration of the constitution which may have remained uninjured from the commencement of the disease, can produce this effect. If the disorder arose from mere over excitement, we can easily imagine that rest would in time enable the part to resume its functions; and experience of many cases, in which I have found no perceptible benefit from treatment arise, but after a time vision has, as it were, gradually come round, and perfect recovery taken place, forces upon me the conviction that such is not uncommonly the case; but in those instances in which the suspension of the retinal function seems to arise from a shock or sudden withdrawal of nervous influence, it is not easy to account for the fact above noted, namely, the long continuance of the amaurosis after the nervous centres have recovered their normal state, nor for the other fact, which seems to be equally well established, that in the course of time the function even of the retina will be gradually restored.

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Abstract of Lectures ON THE PHYSIOLOGY OF THE NERVOUS SYSTEM. DELIVERED AT THE ROYAL COLLEGE OF SURGEONS. By E. BROWN-SEQUARD, M.D.

[From Notes by ALEXANDER HENRY, M.D.]

LECTURE IV.

THE duration of the effects of division of one lateral half of the spinal cord is not limited to the period immediately succeeding the performance of the experiment. They have been found to persist for as long a period as eight months, or even two years; and one remarkable phenomenon observed, is the production of epilepsy in guinea-pigs operated on some months previously, by irritating a certain portion of the skin of the face.

What are the Channels by which the Orders of the Will are conveyed to the Muscles? It is more difficult to judge of diminution of motor power than of sensation. The phenomena of loss of sensation are very readily manifested; but a very small amount of change in the spinal cord may produce a diminution of motor power which yet may not be readily appreciable. If a transverse section of the spinal cord be made, so as to cut across the posterior columns, the posterior part of the lateral columns, and a large portion of the grey matter, so as to leave little more than the anterior columns—the animal will be paralysed of motion, while sensation is not entirely lost. If the anterior columns alone be divided, voluntary motor power is much diminished. A similar result obtains if only a part of the anterior and all the lateral columns be left entire; sensibility persists, though somewhat impaired.

Why is voluntary motion so soon diminished or lost? The muscles contain in themselves very little power—much less than is generally supposed; and a very great expenditure of nervous force is required to move a limb. A person may move his limbs readily when in bed, though unable to use them when standing: this arises in part from the removal of the weight which he has to carry. And, if we admit that the nervous fibres conducting the dictates of the will to muscles are distributed through all parts of the cord, especially in the grey matter, we can readily understand how readily motor power is diminished by an injury of the cord, even of not considerable extent.

Distribution of Sensory and Motor Fibres in the Spinal Cord. There is a question of great pathological interest, the solution of which will throw much light on the phenomena attending injuries of the spinal cord. It is this—Are the conductors of sensory impressions distributed in such a way in the spinal cord, that those which come from the posterior (dorsal) surface of the body and limbs pass to the posterior parts of the cord, while those from the anterior (abdominal) parts of the body and limbs are distributed in its anterior part? If it were so, a section of the posterior parts of the cord should induce anaesthesia in the dorsal surface alone, and not in the anterior or abdominal. But this is not what occurs. When there is an injury of the cord capable of producing paralysis of sensation, the paralysis occurs in all parts of the body behind (*i.e.*, to the caudal side of) the injury—even in the viscera. In proportion as a section of the cord is carried deeper and deeper from behind forwards, sensibility is diminished everywhere equally behind the seat of injury. When the anterior columns alone are left, sensation is almost entirely lost, but returns in some hours to a small extent—in all parts equally.

We must then admit that, in any given portion of the cord, however limited, there are fibres of sensation which proceed from all parts of the body. Hence, in diseases of the spinal cord attended with paralysis of sensation, the anaesthesia is distributed over all parts beyond the injury—before, behind, and laterally; on the surface, and in the deep seated parts. There are cases in which the injury is confined to the roots of the nerves, and the paralysis of sensation is on the same side; but this is a different thing from that which has just now been alluded to. A good diagnostic symptom is afforded here—the limitation of loss of sensation to one side of the body is a proof that the lesion is seated in the posterior roots of the