ORIGINAL COMMUNICATIONS.

CLINICAL LECTURES ON MEDICINE, DELIVERED AT ST. THOMAS'S HOSPITAL.

By JAMES RISDON BENNETT, M.D., Physician to the Hospital, and President of the Metropolitan Counties Branch of the Provincial Medical and Surgical Association.

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LECTURE I.

ON A CASE OF PARAPLEGIA.

THE subject of Paraplegia, although one of great interest both to the physiologist and to the practical physician, is still involved in considerable obscurity and difficulty. The very interesting case which has just proved fatal in Edwards' Ward affords me an opportunity for making a few observations, which may be the more useful now that the leading features of this case must be fresh in your minds.

There are several forms of paraplegia, differing essentially in their pathology. In one class of cases, the impairment and loss of sensation and motion of the lower half of the body depend on recognisable disease, and more or less manifest disorganisation of some portion of the spinal cord. Saunders's case was one of this class—a class which in some respects is better understood than some other forms of paraplegia. There is, however, considerable diversity in this class, to which alone I propose now to refer—a diversity of practical as well as scientific importance. But, ere proceeding further, I will give you the principal points in the history of Saunders's case, from the excellent notes with which Mr. Penberthy has been good enough to provide me.

CASE. A. F. Saunders, aged 21, a carter, residing in London, was admitted into the hospital on the 30th of January, 1855. His previous health had been good; his circumstances comfortable; and his habits, according to his own account, temperate and steady. Of the latter, however, there is reason to doubt. His occupation exposed him much to the weather, both by night and day; but he was not aware of having specially suffered from wet or cold on any particular occasion, or of having received any local injury. About a month ago, he felt occasional pains in his loins and the calves of his legs; after a short time, these became so bad that, after sitting a little while, he could scarcely raise himself; but, after walking some minutes, the pain generally subsided in part. About a week after the commencement of these pains, he found a little difficulty in passing his water, during which he had involuntary twitchings of his legs, but at no other time. His lower extremities felt rather "queer" and numb; and his gait became somewhat unsteady. He followed his occupation till seven days ago, when, owing to the pain in his loins, unpleasant sensations in his legs, and weakness, he was obliged to give it up. From the commencement, he had had no medical attendance.

On Sunday afternoon, Jan. 28th, after sitting some time, he raised himself to go out, but immediately fell to the ground, and was unable to get up. After being raised, he moved about the house, and again sat down. On attempting to rise the second time, he again fell; but now all power in his lower extremities, as well as sensation, appeared gone. He was immediately put to bed, and continued there till his removal to the hospital. Previous to the 28th instant, his bowels were regular, but since then he has passed no motion.

State on Admission. He was tall, stout, and strongly built; his face was very red, which he said it always was. There was complete loss of voluntary motion and of sensation in both lower extremities; also in the trunk as high up as the fourth rib; above this, sensation was healthy, and motion perfect in his arms and neck. The temperature of the affected parts was natural, except the feet, which were rather cold. His urine dribbled away unconsciously; the

bladder was not distended. The bowels had not been moved for two days. The tongue was moist, somewhat coated; the appetite good; the skin harsh and dry. The chest was resonant; the respiration easy, carried on by the upper ribs and diaphragm; the respiratory murmur was healthy. The heart's action was regular, and the sounds natural; the pulse 100, full, and pretty strong. He had no headache, or other cerebral symptom.

Sumat pulv. rhei cum hydrarg. ℥j statim.

Milk diet.

Feb. 1st. He had taken the powder, and nearly six ounces of castor oil, without any effect having been produced on his bowels. The tongue was furred. He slept well; otherwise he was just the same.

Sumat pilul. colocynth. cum calomel. gr. xv. statim.
Imponatur emplastrum lyttæ longum inter scapulas.

℞ Pulv. Doveri gr. iv.

Calomel. gr. i. Sumatur ter die.

Feb. 2nd. He passed a very copious and offensive evacuation about two hours after taking the pills. This morning the bowels were again moved. The blister had been on all night, but without effect as yet. The pulse 100.

Feb. 4th. The blister, after remaining on about forty hours, acted tolerably well. The bowels were moved yesterday, but not this day. The tongue was coated, and at the tip dry; the skin harsh and unspiring. He complained of headache. Pulse 96. On the right buttock was a small bed sore, with surrounding redness, and inclined to spread.

Imponatur cataplasma lini et lotio calicis chlorinatæ nati; et sumatur haustus purgans.

He was ordered to be placed on a water-bed.

Feb. 6th. The bowels had been moved; the tongue was coated, and rather dry. He had no headache. He had some tingling sensations extending down the calves of his legs to the feet, but no sensation when touched. The skin was still harsh and dry.

℞ Liquoris ammoniæ acetat. ℥ss.

Misturæ camphoræ ℥iiss.

Fiat haustus 6tis horis sumendus.

Feb. 7th. The tongue was moister; he perspired freely during the night; and the skin was now moist. His appetite was tolerable. He had no pain; there were occasional startings of both legs this day, but no sensation. The urine still dribbled away unconsciously. Pulse 104, not quite so strong.

Feb. 9th. A blister, applied to the back yesterday, vesicated well after remaining on twelve hours. The pulse was 92; the tongue moist. He perspired freely during the night. The bowels were regular; he had no tenderness of the gums; he had frequent startings of the legs, which might be noticed through the bedclothes; there was no sensation. Three grains of carbonate of ammonia were ordered to be taken in the mixture. The pills were omitted.

Feb. 13th. The pulse was 84, full and soft. The blister was repeated; and he was ordered to have a slice of meat.

Feb. 14th. The blister had vesicated well; the bed sore was somewhat smaller, and looked healthy. The bowels were regular; the appetite good; he slept well. There was not so much starting and twitching of his legs. He complained of a tearing sensation in the abdomen, as if some one were pulling his intestines forcibly.

Feb. 16th. The right buttock was worse; the sore was about the size of a half-crown, and was dark and sloughy. The pulse was 90, not so full. The acetate of ammonia mixture was omitted.

℞ Zinci sulphatis gr. ij.

Infus. cascariellæ ℥iiss. M.

Fiat haustus ter die sumendus.

He was ordered to have a pint of porter daily.

Feb. 19th. The slough on the right buttock had separated, leaving a large unhealthy ulcer. On the left buttock

was a small sore, which looked more healthy, and inclined to heal in one part. He "felt he had legs", but had no power over them. He passed urine and faeces involuntarily; there was no distension of the bladder. His bowels were generally moved twice in twenty-four hours.

Feb. 20th. He was much the same; his appetite was good; he was free from pain. Pulse 96, full and soft.

Angeatur dosis zinci sulphatis ad gr. iv.
Repetatur emplastr. lyttæ, dorso applicandum.

Zinc ointment and a poultice were ordered to be applied.

Feb. 26th. He complained of uneasy tearing sensations in his abdomen, especially towards night; also of tightness about the chest. The last blister rose tolerably, and was now healing.

March 3rd. The sores on the buttocks were larger, and not so healthy. The patient's bowels were regular; the tongue was covered with a greyish fur, and moist. He stated that he had slight sensation in the lower half of the body. He had occasional twitching of the legs, though less than there had been. Pulse 90.

March 14th. His face was flushed, and the features were sharper than at the last report. The tongue was somewhat coated; the appetite not so good; the pulse was 95, and soft. Brandy 3ij.

March 16th. The sores were deepening on the buttocks; and just below, and on the inside of each patella, the skin was dark, and likely to slough. He perspired freely. The tongue was pale, and covered with a whitish fur. His appetite was moderate. He was ordered to have a mutton chop, and the sores to be dressed with Peruvian balsam.

March 9th. The pulse was 98, smaller and softer. He perspired profusely at night, and freely during the day. His appetite was middling. He felt an aching pain in both legs yesterday, and had a little at present, but did not feel the sores. The skin, which was dark on the knees, had sloughed, leaving sores about the size of half-crowns. The tongue was yellowish at the margin, and brownish in the middle; not so moist. He was very thirsty, and slept badly.

March 20th. Respiration was quicker, and not so easy; he could not take such deep inspirations as formerly. The sloughs were deepening and extending. His face was more flushed; the pulse was quick and soft; the bowels had been moved; he perspired very freely; the tongue was drier. The skin covering the fourth, fifth, and sixth ribs of the right side posteriorly, was sloughing off to the extent of three or four inches on each: of this he was not conscious.

R. Strychnie gr. 1-15.
Quinæ disulph. gr. v.
Acid. sulphur. dil. mxx.
Mist. camph. ʒiss. M.

Fiat haustus ter die sumendus.

March 23rd. He had very little twitching of the legs; his pulse was a little fuller. He was wasting, his features being sharper and much paler. Perspiration was excessive. He was very thirsty; the tongue was flabby and moister. The sores were deepening. Brandy ʒij.

1 P.M. He had an attack of shivering, which continued about half an hour. Hot bottles had been applied to the feet, etc. He passed plenty of urine; which still, however, dribbled away unconsciously. He was ordered to have an egg in his brandy.

March 26th. He complained much of the cough during the night, which much disturbed him. He perspired rather less; the bowels were rather confined. The right leg and foot were slightly oedematous. He said he had more sensation on that side. The ulcers were just the same. The tongue was red and patched with fur, and fissured near the tip. The appetite was tolerable; he had less thirst. He slept in the morning three or four hours after the cough subsided. His face was flushed, the cheeks presenting a deep hectic blush. The cerebral functions were unimpaired.

March 27th. He had had more twitching of his legs during the last two or three days; the cough was very troublesome

at night; the perspiration less; the tongue furrowed, red, and dry.

From this date no important fresh symptom occurred till his death. Shivering fits occurred at intervals. His cough, which continued to distress him a good deal, manifestly depended chiefly on the accumulation of mucus in the bronchi, which he was unable to expectorate; but his breathing was never very laboured or oppressed; and the diaphragm continued to act freely. The hectic symptoms were more and more pronounced; he had colliquative diarrhoea, and wasted much. Occasionally there was much twitching and jumping of the legs. The intellectual functions and all the special senses remained entire till the time of his death, which took place on the 8th of May, from gradually increasing exhaustion.

The *post mortem* examination was made the same day. The body, which measured six feet, weighed 7 st. 6 lb. The thoracic contents were quite healthy, with the exception that the lungs were loaded throughout with muco-puriform secretion. The liver was large, weighing 5 lb. 14 oz.; it presented a well marked waxy character on section; and the cells, on examination by the microscope, presented considerably more fat than usual. The spleen, of moderate size, presented also a waxy appearance. The kidneys were of full size, and healthy. The brain and its membranes were quite healthy. On opening the spinal canal, the parts around the theca vertebralis, and the theca itself, were found to be perfectly healthy. A portion of the spinal cord, about two inches in length, situated opposite to the sixth dorsal vertebra, was reduced to a soft pulp, which could readily be washed away by a stream of water, and had a yellowish green colour. The softening implicated the entire thickness of the cord, and above and below passed gradually into the healthy tissue. The colour and consistence of the diseased portion were uniform throughout, and the surface of the arachnoid over it was smooth and natural. Elsewhere the spinal cord, both above and below, was perfectly natural. Under the microscope, the softened part presented the normal elements; but the nerve-tubes were much more broken down than usual; and the tissue was studded here and there irregularly, but not thickly, with compound granular cells, of various and frequently considerable size. No other abnormal appearance of any kind whatever could be discovered.

REMARKS. We have here a case of paraplegia occurring in an apparently healthy, strong man, in whom the paralysis is sufficiently explained by the unmistakable and complete degeneration of a limited portion of the spinal cord. It is, however, but a small matter to have discovered thus much. Far more important is it to ascertain the nature and cause of that organic change in the spinal cord the effects of which were so manifest and so serious. There is no evidence of the disease having been induced by physical violence or local injury, although the origin of similar cases is not infrequently attributed to a fall or blows, by which it might be assumed that the nervous centres had suffered concussion. But some of the most acute cases that I have seen could not be referred to any physical violence. Was, then, the disease of constitutional origin? We know that various constitutional conditions manifest themselves by local changes, though we are quite unable to say why the local effects should take place in one spot rather than another. The first evidence of the syphilitic poison having invaded the whole system may be the occurrence of inflammation and ulceration of the fauces; and a very limited and peculiar form of inflammation of the ball of the great toe is often the first evidence of the gouty diathesis. And as moral causes often determine the access of a fit of gout, so have I seen reason to think that moral causes have determined the occurrence of such cases as this. There is indeed no reason why the local changes in the spinal cord in the present case may not have had a constitutional cause. If it really were so, it is of the utmost practical importance in the treatment of such a case. But if the most careful inquiry failed to elicit any mechanical cause of the disease, on the other hand, the only

other morbid appearance, besides the softened cord, which the *post mortem* examination revealed, was of a character that is usually associated with, and implies, a constitutional cachexia or nutrient derangement, viz., a waxy and fatty liver. But this condition of liver cannot be taken as evidence of a pre-existing cachexia. It may have been the result of nutrient changes consequent on the local disease. Fatty liver is very often seen independent of phthisis, but, so far as my observation goes, usually in connexion with such conditions as imply impaired oxygenating power of the lungs. Now, although in the present case the immediate cause of death was not, as often happens in similar cases, from paralysis of the diaphragm and respiratory muscles, yet there was considerable and protracted impairment of the respiratory process. There was very imperfect action of the lungs, as indicated by the breathing, and the collection of pulmonary secretion, giving rise to short, frequent, and ineffectual cough, which led us frequently to examine the lungs carefully, and to suspect that tubercular disease might exist. But I could never detect evidence of anything more than what was subsequently proved by the *post mortem* examination, viz., a loaded state of the bronchial tubes. This condition of lungs, which gave rise to one of the most troublesome and distressing symptoms, must have seriously interfered with their oxygenating function. Thus, during a protracted illness, in which emaciation and waste of tissues were continually going on, the blood would probably become loaded with oily matters, which might be deposited in the liver. At all events, it is in such circumstances that we most frequently meet with fatty liver.

But, even assuming that the local disease of the spinal cord was the consequence of some constitutional derangement, what was the nature of the local change? Was it the result of inflammation? This again is a question of great practical importance. The few scattered compound granular cells distributed through the softened portion, together with the colour and general appearance, would be considered by many persons as decisive of the inflammatory origin of the change. I will not stop to inquire how far these appearances are or are not sufficient to justify such a conclusion, nor to discuss what we are to understand by the term inflammation. But I must beg special attention to the absence of all signs of surrounding congestion, effusion, swelling, or thickening, and of the least implication of the meninges. The surrounding arachnoid was perfectly smooth and natural; nor was there the least fibrinous effusion about the coverings of the cord, or anything, in the cord itself, above or below the softened part, which could indicate inflammatory action. It is therefore, I think, tolerably certain that, if the softening had its origin in inflammation, it was not of a character that would render it probable that it would be amenable to ordinary antiphlogistic remedies. Neither was there anything revealed by the *post mortem* examination that would lead to the suspicion that the local change was of a scrofulous or tubercular character.

You will have noticed that, in the treatment of this case, I neither employed any very vigorous antiphlogistic remedies, nor mercury, to the extent of affecting the system. The first symptoms of paralysis having occurred a month previous to the man's admission to the hospital, I did not think it probable that the disease, whatever might have been its original nature, would be benefited by depletion, or other vigorous antiphlogistic means. And, as regards mercury, I confess that my experience has led me to be very cautious in its use in such cases. I grant that there are cases of paraplegia, whether resulting from violence or independent of it, in which mercury appears to be of decided utility; and that the diagnosis between these and such cases as the present is not always easy. And it is observable that, in the present instance, the occurrence of a certain amount of pain, and of excito-motory phenomena, did not depend on any implication of the coverings of the cord in the inflammatory action, if such it were. Yet these are the cases in which mercury is most frequently of use. Blisters, purgatives, alteratives, with sedatives, if necessary, to allay pains and spasms, and finally nerve tonics, are of most use.

Time does not allow of my entering on the diagnosis of the various forms of even those varieties of paraplegia which depend on centric disease. Let me, however, beg attention to the extensive sloughing of the integuments in this case, as showing the intimate connexion between the function of nutrition and the nervous power derived through the spinal cord. The functions of digestion, secretion, and excretion, were maintained for a long time in tolerable integrity, being chiefly dependent on the sympathetic system. But sloughing of the integuments occurs very early in this, the most hopeless form of paraplegia. I have seen extensive sloughs form in the course of eight or ten days from the first occurrence of the paralytic symptoms. It is important to be aware of this, not only as an aid to diagnosis, but also that you may be early on the look out for its occurrence, and adopt the requisite means for preventing it as far as possible.

The peripheral or eccentric phenomena, in cases of paraplegia, vary considerably, and, however slight in appearance, are deserving of notice. Some of the first symptoms in the present case were of this class, viz., pains of a rheumatic character in the limbs, felt chiefly on attempting exercise, and to a certain extent relieved during and by exercise, although subsequently aggravated. Such pains are not unfrequently mistaken at first for rheumatism; and it is not till some want of power of the bladder, or other unequivocal symptom, is developed, that the true character of such symptoms, referrible to the peripheral extremities of the nerves, is recognised. The abdominal pains subsequently complained of by Saunders were of a similar character. Now, it is important to observe, that such pains, and even spasmodic action, whether of a tonic or clonic character, are by no means most severe in the most serious forms of paraplegia. On the contrary, such phenomena are sometimes most marked in cases where the meninges are chiefly implicated, and which, for the most part, are far more amenable to treatment than such a case as we have been considering. Let me also caution you not to be deceived by the patient's description of subjective phenomena into the belief that recovery is taking place. When our patient talked of returning sensation in his legs, of "feeling that he had legs", he was in fact but illustrating what is seen after the amputation of a limb, when pain or irritation of the stump is referred to the toes of the lost limb.

THE MODERN TREATMENT OF FRACTURES.

By BENJAMIN HUNT, Esq., Surgeon to the General Dispensary, Birmingham; late Resident Surgeon to the Queen's Hospital.

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CASE XV. G. W., aged 44 years, a robust man, broke both bones of his right leg by falling in the street during a hard frost. The accident occurred in the night, and he lay on the ground for three hours before he could obtain assistance to carry him home. He was brought to the hospital on the 27th of December 1853, ten hours after the receipt of the injury; the limb was livid from cold, and swollen, measuring two inches and a half more round the calf than the other; the fracture was rather below the middle of the tibia, and oblique; the upper fragment was prominent under the integument, its sharp extremity threatening to protrude; the inferior fragment was drawn upwards by the muscles, causing much displacement. To assist in bringing the broken ends into apposition, the man was placed upon his back, his thigh flexed upon his body, and his leg upon his thigh; a fold of lint was next laid along the shin, and the leg was bandaged firmly, commencing from the toes, gradual and steady extension being kept up at the same time, until the bandage had been