Clinical Lecture

ON

CASES OF SYPHILITIC PARAPLEGIA.

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A MAN was brought into the hospital in September last with complete paralysis of the right lower extremity, some weakness in the left, and with little or no power over his bladder. He was a coachman, twenty-five years of age; and nine days before he came here he had been seized with "cramp" in the right ham, the pain being intense and paroxysmal, lasting perhaps two or three minutes, and recurring after a few moments' interval. The pains at first appeared to be caused by movement, but they gradually came to occur independently of any such provocation. From the first the limb was weak, but the man persevered in driving his master until two days before his admission, when he became completely incapacitated. Now it happened that he was in the service of a surgeon, who, being aware, from personal observation, that a year ago he had suffered from unmistakable syphilitic ulceration of the leg, referable to an infection six months previously, concluded that his paraplegia depended on the same cause, and sent the patient to the hospital.

When Mr. Broster, our resident medical officer, came to examine him, he found that the man had very severe pain between the bladebones, if he tried to sit up, and his back appeared to be very stiff. He was at once placed upon a water bed, but even as he lay on this he was never free from a dull aching in the dorsal region, which was increased to acute suffering if he tried to turn. Percussion along the spine did not occasion pain, but when it was applied about the second lumbar vertebra, the right leg was seen to twitch and a cramp-like pain was started in the ham. There were sharp pains "like knives" around his trunk, from the nipples to the hips, which were increased by movement, a numbed feeling about the belly, and a sensation, he said, "as if he had eaten too much." Sometimes the right great toe twitched, and this was accompanied by pains which shot up the leg and thigh. In the right leg a pin prick was scarcely felt at all, whilst in the thigh it was described as weight. In the left lower extremity there was also a similar modification of sensibility, but to a less extent. In both limbs there was blunted sensibility to touch, especially marked in the right, and in both pricks or pinches set up reflex twitchings. On the right side the patient could only slightly move the ankle-joint, no other motion being practicable. The left lower extremity, on the other hand, though not so strong as in health, was not very materially lessened in power. The muscles of both reacted well to faradism. There was paresis of the bladder. The pulse was 88; temperature 98.4° F. Urine free from albumen.

Without loss of time the iodide of potassium was given in doses of ten grains (increased in a few days to thirty) three times a day. The spine was painted for a few days with the oleate of mercury (15 per cent. solution), which was exchanged for inunction with mercurial ointment ten days after his admission. When a drachm of this had been rubbed in daily for eleven days, the gums became tender, and it was continued at longer intervals. This, with the addition of a hypodermic injection of morphia occasionally during the first few days, when his pains deprived him of rest, constituted the treatment.

The patient's progress was as follows. On the sixth day he felt stronger, and had slept fairly without a sedative. He could sit up in bed by himself, and was able to bend his back without pain; there was still, however, decided stiffness in his spine. The action of the bladder had become normal. On the tenth day the cramp-like pains and twitchings had ceased, and he could bend his back freely. For the first time, too, he could now move his right leg and raise it from the bed. The cutaneous sensibility was also distinctly improved; he could feel a gentle touch, but still could not recognise the prick of a pin. The feeling of distension in the belly had disappeared. Days passed, and he

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continued to improve steadily in the power of his right lower extremity, the force of the muscles which move the hip-joint returning before that of those belonging to the leg and foot. On the thirty-sixth day it is noted that the patient is up and about and walking very fairly, his only inconvenience being that he sometimes gets a cramp in the back of the right thigh and slight pain in the hypogastric region. The right leg seems as strong as the left. There is no longer any defect of sensibility. On the fiftieth day he was discharged, and returned almost immediately to his occupation, which he continues to follow.

There is a point about the patient's temperature which I must not omit. Even in the first few days, when the treatment was but just commenced, the thermometer seldom marked so much as one degree above the normal rate, and on only two occasions during his illness (both within the first four days) did it reach so high as 100°.

It is quite evident that in this case there was a more or less circumscribed inflammation of the spinal meninges, which the seat of pain and the distribution of paralysis enable us to locate in the lower dorsal portion of the cord, affecting especially, though not exclusively, its right half. With the clear history of syphilis before us, we can well imagine that the meningitis was gummatous, and that it probably involved especially the internal surface of the dura mater (pachymeningitis), but extended also to the contiguous soft membranes. In such a condition (as, indeed, I have confirmed post mortem in another case) there may be a complete agglutination and thickening of the membranes, leading, if not arrested, to softening of the cord, with no greater elevation of temperature than was observed here. Note also that there was no tenderness on percussing the vertebral spines. The absence of this symptom is too often regarded as being almost inconsistent with the existence of serious lesion of the cord or its coverings. Nothing can well be less founded on fact. If we put aside cases in which the vertebral column itself is diseased, we shall find that the existence of very marked spinal tenderness points strongly in the direction of a functional nervous affection of comparatively little importance, and does not indicate a serious organic lesion of the spinal cord. On the other hand, the stiffness of the spine which this man had, and the exquisite pain which attended his efforts to turn in bed, whilst they are highly characteristic of spinal meningitis, form no part of the symptoms of "spinal irritation." Happily, in this instance, we have not had the opportunity of confirming our diagnosis. Fortune favoured the patient in giving him a medical master, for he would probably, I suppose, have become at the least permanently paraplegic, if even he had escaped with his life, had not the nature of his case been early recognised, and the treatment adopted by which he was rapidly and completely cured.

It will have been noticed that although the loss of power was almost confined to the right lower extremity (where it was complete), there was considerable cutaneous anæsthesia in both limbs; in the right, however—the side most paralysed—more than in the left. Now we know from Brown-Séquard's discovery that in hemiparaplegia from disease or injury of one lateral half of the cord, whilst the limb of the affected side is paralysed as to motion, loss of cutaneous sensibility is confined to the opposite extremity, the paralysed limb itself being indeed somewhat hyperæsthetic. This is explained, as is well known, by the sensory fibres crossing over at once to ascend in the side of the cord opposite to that at which they have entered. In the present case the history, and still more the result (for the man could hardly otherwise have made the absolute recovery which we have seen), show that the cord itself could not have been the seat of any destructive lesion. The mischief evidently lay in the membranes, and was more or less diffused. There can be little doubt that the inflammatory products, whilst almost confined to the back part of the left side of the cord, where they pressed upon the posterior roots, and thus caused loss of sensation in this limb, left the anterior roots of this side nearly free. In the right half, however, both posterior and anterior roots must have been involved in the inflammatory changes—hence the radiated pains and cramps, followed by loss of power and anæsthesia. I dwell particularly upon this point because it seems to me to present something more than a physiological interest. In treating a patient with complete paralysis, which is almost entirely confined to one lower extremity, if we find the loss of cutaneous sensibility greatest in the most paralysed limb, we may reasonably infer that the lesion is not situated in

the cord itself, but affects its coverings, and our prognosis will of course be most favourably influenced by this consideration.

There is more difficulty in forming an exact diagnosis in the case of Margaret M—, aged twenty-nine, a married woman of respectable appearance, who came to the hospital with so much loss of power and numbness in both lower extremities (especially the right) that she could only just manage to walk with help into the consulting-room. It seemed that she had been attacked three months before with feelings of numbness and pins and needles in the feet, and that these symptoms had gradually extended upwards, in spite of medical treatment, so that her arms had become involved, and she could scarcely do anything to help herself. There was also constipation and delay with the bladder, besides a feeling as of a tight band around the waist, and "deadness up to the chest." She had been married four years, had two living children, and one who had died. Her left pupil was observed to be smaller than the right, and of somewhat irregular outline, but she had no complaint to make of her sight; could read No. 1 Snellen easily, and did not remember to have ever had anything wrong with her eyes. On using the ophthalmoscope (which we employ, thanks to the wise teaching of Dr. Hughlings Jackson, as a matter of routine) we found in the right eye very evident remains of disseminated choroiditis in the form of numerous atrophic and pigmented spots, whilst in the left there were old adhesions of the iris and opacities of the vitreous body. There was no history of bad sore-throat or eruption on the skin.

Ten grains of iodide were ordered to be taken three times a day. In a week she had almost entirely lost the feeling of tightness round the waist and the "deadness." In another week it is noted that there is now no numbness in her legs, and no longer any delay with the bladder. The hands, however, were still very numb and dead, so that she could not use a needle or pen. The dose of iodide was increased to fifteen grains. A week later, and she had managed to do a little work, whilst by the end of a month she reported herself as being perfectly well, and we did not see her again.

The ophthalmoscopic appearances in this case (which Dr. Liebreich was good enough to confirm) point to constitutional syphilis with such force that the corroborative evidence afforded by the immediate influence of the iodide is scarcely needed to establish the specific nature of the lesion from which this woman suffered. But as regards the exact character of this lesion I do not think we are in a position to speak with certainty. It was diffuse; not a tumour, for it spread gradually upwards till it came to involve the motor and sensory tracts to the upper extremities; and, besides this, there was no exaggeration of reflex action on tickling the soles. It could hardly have been meningitis, for there was no stiffness of the spine, nor were there pains of any kind. The most probable suggestion appears to be that there was an alteration of blood circulation in the membranes of the cord. The mode in which the affection travelled upwards reminded one of those terribly fatal cases of acute ascending paralysis which are not often seen; but the length of time which was in this instance occupied in the process, and the patient's eventual recovery, are more than sufficient to exclude such an explanation. It was chiefly, also, in its comparatively slow progress that it differed from the case of a man who was under my care in this hospital six years ago,¹ in which an extension upwards of some lesion inducing similar symptoms, so as to involve the medulla oblongata, placed the patient in the most imminent danger from paralysis of the muscles of respiration. Yet in many points—especially in the absence of pains and of stiffness, and the association of numbness with motor palsy—this woman's case resembled that of the man described. In each, too, there was evidence of syphilis, and the man began to improve immediately, just as did the female, under the employment of iodide, and they both recovered perfectly. A case of a very similar character was treated by Professor Wagner;² it also occurred in the sequel of syphilis, and was immediately influenced and rapidly cured by specific treatment. The peculiar characteristics of such cases, of which there are several on record, are that there is an ascending paralysis, involving both motion and sensation to a greater or less extent, which is unaccompanied by fever, or by any of the ordinary evidence of meningitis,

but which the resulting complete recovery shows can hardly have been due to myelitis. Whether a travelling change in vascularity of the soft membranes, with perhaps some resulting oedema, will account for the symptoms is little but mere conjecture. Nor can we at present satisfactorily explain—supposing that idea to be accepted—the particular mode in which constitutional syphilis (the association with which is too frequent to be a mere coincidence) brings about such an altered condition of circulation. But it is not, perhaps, extravagant to suppose that there may be a thickening of the walls of minute bloodvessels (with a consequent diminution of their calibre), which gives way to specific treatment.

Croonian Lectures

ON

SOME APPLICATIONS OF PHYSICS TO MEDICINE.

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LECTURE I.—PART I.

PHYSICAL BASIS OF AUSCULTATION.

IT must be obvious to any thinking person in the present day that, whereas certain branches of practical medicine are rapidly tending towards chemistry, others must ultimately in a similar way be absorbed into physics. It will be a long time before such a desirable result can be attained, and it will not, perhaps, be attained in our day; but it is our duty to hasten this absorption of the smaller, or rather the less scientific, department into the more accurate methods which are represented by the two opposite poles of physics and chemistry. At present it may be claimed for the physical department of medicine that it is more advanced than is the chemical department. We know very little of the internal and actual functions of the organs of the body. We can explore some way down one passage, the air-passage; we can feel some little way down another; we can examine with our fingers and eyes a certain way upwards in other passages; but when we reach the ends of this exploration, there is a large *terra incognita* between. In regard to digestion, there is no doubt we can pour into the stomach various reagents and substances which will produce a powerful result, sometimes such as we wish, and which we can control, but not always. On the other hand, we may, to a certain extent, obtain proof of the correctness of our knowledge in the respiratory tract. In the respiratory and also in the circulatory system we may, and shall in the course of time, reduce the actions going on to purely hydrodynamical and pneumatic questions. If we are to reduce them with anything like accuracy; if that ultimate reign of mathematics over the sciences of observation, which has not yet come, is to be advanced, it must be, in medicine at least, by fully understanding the physical laws of fluids and gases in so far as they touch upon conditions of circulation or respiration. We have indeed, and we then shall be able to utilise, an immense multitude of recorded facts as regards both the one and the other process. In this century we have advanced to greater elaboration and precision in observing than were ever previously attained; but in many instances the theory by which a phenomenon is explained is materially behind the observations. The observations are good and abundant; they are almost too abundant; they remind one of the dictum of Bacon, that an observation repeated again and again is a *res puerilis*.

It has occurred to me that many of our good old medical observations require re-examination in the light of modern researches in mathematics, acoustics, and mechanics. Our old views of auscultation, percussion, and all similar means by which we explore the human body, are only of the date when those great advances were made. The researches of Helmholtz, of Marey, and of Haughton are of the greatest

¹ Clin. Soc. Trans., vol. vii., p. 75.

² Archiv der Heilkunde, 1869, p. 105. Leipzig.