of infection could be traced, nor between this case and the next, which occurred four weeks later. This, however, is the history of the disease everywhere. The general health of the gaoi is very good; with 1,800 prisoners the death-rate *per mille* is only 11, a figure almost as good as any English prison and less than half the provincial (Bengal) death-rate for men from 15 to 45 years.

The case is interesting on account of three features not hitherto reported in any case in India (1) lumbar puncture; (2) the finding and culture of the diplococcus intracellularis of Weischelbaum and the demonstration of Kernig's symptoms; the latter a valuable aid in diagnosis which has not yet found its way into the textbooks.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL September 24th, 1898, p. 871; *vide* also *Journal of Tropical Medicine*, vol. 1. No. 1, and *Dublin Journal of Medical Science*, February, 1899.

THE TREATMENT OF TETANUS BY THE INTRACEREBRAL INJECTION OF ANTITOXIN:

WITH NOTES OF A FATAL CASE TREATED BY THIS METHOD.

By CHARLES FIRMIN CUTHBERT, M.R.C.S.,
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THE success of this treatment so well described by Dr. Semple in the BRITISH MEDICAL JOURNAL of January 7th, 1899, also the case under the care of Dr. James Lawrence and Mr. John Hartley at the Darlington Hospital, reported in the same JOURNAL on June 3rd, 1899, cannot fail to have given great encouragement to surgeons in the treatment of these terrible cases by the method of MM. Roux and Borrel. Although the following case did not terminate in recovery, yet perhaps this is all the more reason why it should be reported.

On May 24th, 1899, T. G., aged 21, sent for me to see him on account of a fall from his horse, and in my absence from home my friend, Mr. T. Hampton, who helps me in my work, went to see him at once, and took charge of the case, and although I saw him at intervals I am much indebted to Mr. Hampton for the notes and many good suggestions. The last time I saw the case prior to the onset of tetanus was on June 1st, when the wound was rapidly healing, and there were no symptoms to indicate that tetanus was coming on.

The injury on May 24th consisted of a lacerated and jagged wound over the tubercle of the left tibia about two inches long and half an inch deep. At the time seen there was no bleeding, and the wound had been washed and cleansed of a considerable amount of dirt which the patient averred had got into it by being dragged some distance after the fall.

The wound was again washed thoroughly and all round with soap and water, and biniodide of mercury lotion (1 in 1,000) was kept thoroughly applied for half an hour. It was again washed with soap and water and thoroughly bathed with biniodide lotion: four sutures were put in, the wound dressed, and the leg put up in a back splint.

On May 25th the patient complained of some pain in the leg.

On May 26th the leg was still very painful, so the dressing was removed, and the wound found to be suppurating. It was well irrigated with biniodide lotion after removing the sutures, and boroglycerine fomentations were ordered every two hours, with biniodide lotion to wash out the wound each time the fomentation was changed.

On May 27th the patient was easier, and the wound was discharging freely.

On May 31st a dry dressing of iodoform and boracic acid was substituted. I saw him on June 1st, when he appeared to be going on well.

At 9 o'clock on the evening of June 3rd a message was sent saying he had some pain in the neck. Mr. Hampton went at once to see him and found him suffering from difficulty in swallowing, with some slight stiffness in the muscles of the neck and lower jaw.

On June 4th in the morning we went together to see him, and found the signs of tetanus much more pronounced, more stiffening of the jaw, and the difficulty in swallowing almost amounting to complete dysphagia. Spasm of the sterno-mastoid muscles was well marked, and a suspicious appearance of risus sardonius.

The invariably fatal termination of these cases was clearly put before the friends and the operation of intracerebral injection with its prospects of recovery explained. Dr. Batten kindly saw the case with me at 12.30, and concurred in my opinion.

The head was shaved and the skin well cleansed, with every attempt to render the skin antiseptic, and a dressing applied. At 4.30 the patient was anaesthetised by chloroform, and the following lines of surface markings were taken: (1) A line across the top of the skull from the external auditory meatus of one side to that of the other side. (2) A line sagittally backwards from the root of the nose to the occiput, and bisecting line No. 1 at right angles. (3) A line drawn from the external angles of the orbits on either side to the point where the sagittal line met and bisected the line joining the two meati. A point was marked off midway along this third line

as the point for drilling the skull. Two incisions were made, one on either side, about one inch in length, the centre corresponding to the centre of the line No. 3. The tissues were laid bare, and the pericranium having been separated, an Archimedeau drill was used to bore the skull. The needle with a rounded point passed through the drill hole for about 2 inches and attached to an aseptic syringe containing the 5 c.cm. of dried serum dissolved in 5 c.cm. of sterile water, and representing 10 c.cm. of the ordinary antitetanic serum was then injected deeply into the frontal lobes, half the quantity on one side and half on the other, taking 10 minutes to inject each half. The skin was sutured, and the patient was returned to bed. When seen later in the evening he was comfortable, and had quite recovered from the effects of the operation.

On June 5th he had a fair night, sleeping at intervals. His temperature was 99.5°, and this had been the maximum rise in temperature since the morning of June 4th. He was given two injections of antitoxin, each 10 c.cm., into the flank, one in the forenoon and the other in the evening. The recti muscles were much less painful, and the jaw muscles were considerably relaxed. There was in the evening some slight spasm of the recti abdominis. The temperature had risen to 101°. With each injection of antitoxin in the flanks ½ grain of morphine was given hypodermically.

On June 6th he expressed himself as feeling better. His temperature was 101°, and his pulse rate 100. He had slept for three hours, and was much refreshed. Besides being given small quantities of peptonised milk with a spoon, which he had swallowed fairly well, he had been fed with four ounces of peptonised milk, four hourly *per rectum*, and these enemata he had retained. There was less spasm of the recti abdominis, also less pain in swallowing, and the tongue could be protruded further. At 12 o'clock in the day he had slight opisthotonos lasting a few minutes, and his temperature was 101°. He had another injection of 10 c.cm. antitoxin in the flank, with ½ grain morphine hypodermically. At 4 o'clock his temperature was 103.9°, and he appeared restless. About 7.30 he became suddenly delirious and attempted to get out of bed, and after some struggling with the nurse in trying to put him back to bed he died quite suddenly, presumably from heart failure.

I have reported this case fully because I feel the importance of all these cases, and although I was not successful in my attempt I trust that others may obtain the same good result as was obtained in the previous cases.

MAGNESIUM SULPHATE IN TROPICAL DYSENTERY.

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DYSENTERY is a common disease in the Port Louis Gaol, which has an average daily population of 375, consisting chiefly of Indian prisoners; and, as medical officer of the institution, I could not but be deeply interested in the remarks published in the BRITISH MEDICAL JOURNAL by Dr. Wyatt-Smith, Captain Johnston, and others on the treatment of this tropical disease by sulphate of magnesium.

I readily agree with the above writers that ipecacuanha does not deserve its time-honoured reputation of *radix anti-dysenterica*. For many years the classical treatment of dysentery was regularly followed in my hospital practice with but disappointing results. In my experience the majority of patients could not retain sufficiently active doses of the drug, however administered, and in spite of all precautions against emesis. After several days of unsuccessful trial I had in most cases to discontinue it, and to resort to other less nauseous remedies, such as salicylate of bismuth, salol, etc., combined with opium. Nevertheless, the death-rate from dysentery in the prison of Port Louis has never been high. Dysentery in this colony is not a very deadly affection when seen at the outset. On the contrary, it is perfectly amenable to treatment, provided proper attention be paid to the diet. A large proportion of the cases that have come under my notice ran their course in from six to fourteen days, and although as a rule they derived little or no benefit from the administration of ipecacuanha, the dysenteric stools remaining unchanged for days, still, they ultimately yielded to intestinal disinfectants, coupled with a milk diet. The mortality from this disease in the prison hospital, where nearly all the cases are treated from their very commencement, has never been higher than 8 per cent. At the Civil Hospital, which is intended for the general population, the death-rate from dysentery is much higher. It was 20 per cent. last year. This is due to the fact that the uneducated inhabitants of this island are in the habit of throwing themselves into the