for some hours in an infected house is very liable to lead to an attack; and that this is supposed to be especially the case at night. Since many of the cases we saw were soldiers, their movements could be traced to some extent, and in more than one instance there was evidence of a single exposure after breaking bounds for a single night. Similar experiences are told of ship's crews under similar circumstances; another example is to be found in the case of 100 American military prisoners who were confined in a barrack in which there had been several hundred deaths through yellow fever during the previous year of Spanish occupation; none of these prisoners acquired the disease, but some 25 of their custodians fell ill or died of the fever.

Through the courtesy of Major Gorgas we were enabled to see the distribution of the fatal cases of yellow fever in the city for the past ten years. In these it was rather striking that the more disreputable quarters of the town were free from deaths from this cause. Immigrant women are few, and presumably the inhabitants are all "immunes;" still it is not improbable that the infective agent is harboured amongst them.

These few notes on some epidemiological points are submitted in the hope that they may be of some interest to students of the perplexing questions and of the unravelled natural history of yellow fever.

REFERENCE.

¹ *New Orleans Medical and Surgical Journal*, May, 1900.

TWO CASES OF AMPUTATION AT THE HIP-JOINT FOR GUNSHOT FRACTURE OF THE THIGH DURING THE INTERMEDIATE STAGE, FOLLOWED BY RECOVERY IN ONE.

BY CAPTAIN F. J. W. PORTER,
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The rarity of recovery after amputation at the hip-joint in the intermediate stage after gunshot injury induces me to report the following cases.

CASE I.—A private in the 10th Hussars was admitted to No. 11 Field Hospital, at Rensburg, on January 5th, 1900, suffering from gunshot fracture of the left thigh. A few hours afterwards he was transferred to the hospital train which happened to be at Rensburg. Whilst there he had two severe attacks of hæmorrhage from the exit wound, and was plugged under an anæsthetic. He continued to bleed, so about 4 P.M. on January 6th he was taken back to the field hospital, placed under chloroform, and the wound examined. The bullet (a Mauser most probably) had entered at the middle line of the left thigh, posteriorly, passed in an upward and outward direction, and had come out on the outer side of the thigh near the great trochanter. There was a large ragged cavity, studded by small spicules of bone, and there seemed to be loss of bone to the extent of about an inch. The examination was followed by free oozing, and it was considered that the best treatment would be amputation at the hip-joint. The patient had received his injury fifty-seven hours before, his pulse was very feeble; he had a very blanched appearance and an elevated temperature.

The anæsthetic (chloroform) was administered by Captain Fawcett, R.A.M.C., and my assistant was Major A. E. Tate, R.A.M.C., who was in command of this half of the house. As it was obvious that the patient would not stand a prolonged operation, the transfixion method was adopted. Owing to the high position of the fracture, and consequent loss of leverage, considerable difficulty was experienced in disarticulating. The thickness of the anterior flap and quivering of the muscles made the satisfactory controlling of the hæmorrhage difficult. The posterior part of the wound was therefore packed with gauze and wool sponges, and firm pressure was kept up by an orderly while all the vessels in the anterior flap were secured. At this point the pulse was hardly perceptible. Liq. strychn., mv, was injected, and the operation rapidly completed. There was extraordinarily little hæmorrhage during the cutting of the posterior flap. Liq. strychn., mx, was injected at this stage, the flaps were united by interrupted silkworm gut sutures, and a dry dressing applied. The patient was removed to a tent in a condition of great shock. Liq. strychn., mxv was then injected, hot bottles were applied, and a hot salt and water enema given, which was retained. In the space of one hour liq. strychn., mxxx, had been given, and the effect on the pulse was marvellous. He had no signs of poisoning by the drug. Anæsthetic vomiting was very troublesome and rendered the administration of stimulants by the mouth impossible. By 9 P.M. this had ceased, the pulse was strong and full, and patient was quite rational. Very little blood was lost during the operation. During the night he took a large amount of nourishment, but refused champagne and brandy; next morning he had a temperature of 102°, but there was no sign of shock.

From January 7th until the night of January 12th he did very well, then there was rather a severe hæmorrhage from the upper and outer angle of the wound, with a suspicious increase of tension and feeling of fullness in the stump. As the line of incision had passed at this point the exit

wound caused by the bullet, it was thought that perhaps the hæmorrhage was due to necrosis of some tissue here, and that local styptics might stop it. The dressings were therefore removed and the stump watched carefully. Collodion and cotton wool was applied over the bleeding point and seemed to act effectually.

On January 14th, about 6 P.M., there was a very severe hæmorrhage. Pressure was applied and arrangements made to open up the stump. Liq. strychn., mx was injected and chloroform administered. The sutures were removed from the outer side of the incision, and about a handful of blood clot, partly organised in places, removed. The parts were thoroughly swabbed out, but no definite bleeding point could be seen. A large drainage tube was placed across the stump, and three deep silkworm-gut sutures applied, so as to bring the muscles on the outer side into close apposition. In spite of his bloodless condition he rallied very well. Up to this time there had been no suppuration, but now there was a free discharge of sanious pus and broken-down blood clot.

January 1900.

On January 16th the patient was drowsy and irritable all day, and would not take his food. At about 5 P.M. he became violently delirious, and tore his dressing partly off. He was given a hypodermic injection of morphine gr. 1/2, and liq. strychn., mv. When he fell asleep a strong nutrient enema was given and retained. This was repeated at 8.30 P.M., by which time he was awake, and had become quite rational again.

On the evening of January 18th his temperature had risen to 102°, and pocketing of pus was suspected. This was found next day to be towards the posterior edge of the gluteus maximus. The patient was seen in the afternoon by Sir William Mac Cormac, who agreed as to the place of incision, and kindly helped me to put in a drainage tube. This was done under chloroform, and the parts were well irrigated with Condy's fluid.

On January 20th, owing to the hospital moving forwards, the case was handed over to Captain Dowse, R.A.M.C., Sixth Field Hospital. I rode over and saw the patient twice afterwards, but Captain Dowse looked after his treatment until he was sent to De Aar, on the route for Wynberg, on January 27th, exactly three weeks after the operation. At this time the lower margin of the wound had almost healed; there was still a free discharge of healthy pus; a normal morning temperature, with a rise to 100° in the evening.

The patient had had rather a severe attack of diarrhoea for a couple of days previously, but in spite of that looked well and in good spirits. I heard from one of our medical officers who saw the man at De Aar some days subsequently that he was then doing well. He completely recovered, and was sent to the Herbert Hospital, Woolwich. There, unfortunately, he contracted pneumonia, of which he died.

The risks from this dangerous operation were considerably increased by the occurrence of secondary hæmorrhage and diarrhoea, also by the administration of chloroform on two occasions after the original operation. The occurrence of the violent delirium on the 16th is also peculiar. The patient was treated for three weeks in a bell tent. Dust storms were almost a daily occurrence. His bed consisted of an ambulance stretcher over which several folded blankets were laid. No sheets were available, and yet on his transfer to De Aar he only had two very superficial bedsores over the sacrum, each about as large as a threepenny piece. I think this reflects great credit on the nursing bestowed on him by the men of the R.A.M.C., of whom I should like to mention Corporal Glenny, who looked after him most of the time.

CASE II.—On April 24th, 1900, Sergeant G., of the 9th Lancers, was shot in the right thigh by an express bullet about 11 A.M. The bone was badly fractured about the middle third, and there was a very large exit wound on the front of the thigh. Owing to the exigencies of the march amputation could not be carried out in the primary stage. On the evening of the 26th there was found to be spreading gangrene. Mr. Watson Cheyne happened to pass near where my temporary hospital was, and saw the case with me. He advised amputation at the hip-joint, and kindly helped me with the operation, which was carried out by the racquet-shaped incision. It was thought that the line of incision had just passed above the line of the gangrenous invasion. The patient had a hypodermic injection of liq. strychn., miiij before the operation, and miiij immediately after. Very little blood was lost, but the condition of shock was most intense. The usual remedies were applied, and another miiij of liq. strychn. given. His condition continued so bad that I gave him mx of liq. strychn. in one injection. Mr. Cheyne then infused about a pint of saline solution into the median basilic vein. Shortly afterwards his condition improved, and by next morning he was free from shock, and felt very well. We had then to retire towards Bloemfontein, so he was carried on a stretcher by twelve guardsmen, who had volunteered for the purpose. He bore the journey extremely well, and at the midway halt the stump was dressed and found to look very well. Towards evening he became delirious, and died at 8 P.M. of acute septic absorption. I consider that his death was not due in any way to shock, and that he would have recovered but for

the infection of the stump by some very bad type of micro-organism. In this case infusion of saline solution with brandy was used in addition to the hypodermic injection of strychnine, but my own opinion is that the strychnine really enabled him to rally from the shock of the operation.

DIPHTHERIA AND ITS TREATMENT BY ANTITOXIN.

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It is in these days a mere waste of time to bring forward facts solely with the idea of proving the inestimable value of antitoxin in the treatment of diphtheria. Its detractors are few, and of necessity largely inexperienced in its practical utility, for no one who has treated diphtheria by the old method of local disinfectants and general tonics, and then observed the marvellously regular improvement after the early administration of antitoxin, could for a moment doubt its specific nature. So long, however, as there are people whose knowledge is sufficiently deep to teach their fellow-creatures merely upon the information (*sic*) gained by misreading statistics compiled by others, so long may there be found opponents to its use, and one can only pity their ignorance, and pray not only that their number may be small, but that no one may be led into needless suffering by heeding them.

Yet, though the efficacy of the treatment by antitoxin no longer needs substantiation, a good story will always bear repetition, and moreover under different circumstances, it may be possible to bring into greater prominence certain details of the highest importance. It is with this object that I have ventured to tabulate the results in 105 cases of diphtheria observed by myself throughout their course. The cases have all occurred in this hospital between November, 1898, and March, 1900, and have been derived from two sources: (1) attacks amongst the nursing staff, (2) attacks in patients suffering from, or convalescing from, scarlet fever.

The clinical diagnosis has in almost all instances been verified by the cultivation of the Klebs-Loeffler bacillus from swabs sent to the bacteriological laboratory at Owens College. In the remaining cases not examined by Professor Delépine or his assistants the cultivations were made at the hospital. The age of the patients has varied from 18 months to 36 years, no fewer than 85 being under 12 years of age. Of the 20 adult patients 16 were members of the hospital staff.

EARLY SYMPTOMS.

In such a series of cases it is interesting to inquire, What was the earliest indication of the onset of diphtheria? Naturally in patients who are intelligent and old enough to be capable of expressing their feelings, one would expect a subjective sensation to be the first indication, and one finds that of the 20 adults 16 complained of sore throat or pain with deglutition, and 2 of sore throat accompanied by shivering. Of the other 2 cases one had a slight elevation of temperature without complaint on the previous day, whilst in the other patient pyrexia was first noted, and then inquiry elicited the information that the throat felt sore.

But turning now to the other 85 cases, in no fewer than 28 instances the thermometer revealed the onset by showing the presence of pyrexia before any complaint had been made. In 16 instances the patient complained of sore throat, in 5 there was first observed crupiness or hoarseness, in 3 others a discharge from the nose occurred for which no account could be given, and they were therefore examined bacteriologically, whilst in the remaining cases the attack was usually observed in the routine examination of the throat, which is practically universal in such a hospital as this. Without doubt, had they been adult intelligent patients, as already noted, most of the latter would have complained of sore throat, yet I am thoroughly satisfied that in a not inconsiderable number of cases general *malaise* or pyrexia is to be observed before the local symptoms have attracted the individual's attention.

TEMPERATURE.

Of course in many instances, where pyrexia was the first indication, an examination of the throat showed either congestion or definite membrane, and similarly, when sore throat

was complained of, the thermometer would often reveal the presence of pyrexia. On the other hand, in no fewer than 25 instances the temperature was throughout either normal or not above 99° F. Thus the presence or absence of pyrexia at

Chart I.

Chart II.

Chart III.

the beginning of an attack of diphtheria is extremely variable, and even when present its degree is no less variable, for in 41 cases when first observed it was between 101.2° and 105.2° F. and in 5 only was it below 101° F. Further, in 20 cases with pyrexia, owing to a delay in being able to make a clinical diagnosis of diphtheria, the course of the temperature could be observed for a longer or shorter period before the administration of the antitoxin, and the impression gained from these cases is that not only does it vary at its onset, but in its further course it is either very evanescent or very irregular, though occasionally the temperature may steadily ascend as the local symptoms become aggravated. Thus in 13 instances it had fallen to normal, or nearly so, before the antitoxin was given, in 7 of these the fall was very abrupt, and in 4 by large remissions. In the other 2 the injection of antitoxin was still further delayed, and a more gradual secondary increase in pyrexia was taking place. I believe that during the early period of an attack of diphtheria (especially the pharyngeal or