REMARKS ON MAUSER BULLET WOUNDS AND AMPUTATION.

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EARLY SIMPLE WOUNDS.

I FEAR that as our experience of the effects of Mauser bullet wounds during the present war increases, the necessity for a serious modification of the views in reference to their gravity formerly and, I believe, still held by many eminent authorities becomes apparent. On arriving in South Africa I was informed, and for the sake of our brave soldiers was not a little pleased to learn, that, as a rule, the wound inflicted by the Mauser bullet was of so comparatively trivial a nature that it was most unlikely that I should find any of the greater surgical operations, such as amputations, resections, or ligature of the larger vessels, indicated. I heard that the bones when struck were usually tunnelled, not split or pulverised; that penetrating brain wounds frequently gave rise to little inconvenience or trouble; that the bullet usually careered among arteries and veins without inflicting any very serious damage to either beyond the occasional formation of an aneurysmal varix, and that this condition was such a slight source of inconvenience that surgical interference was seldom called for; that nerves were sometimes bruised, but seldom if ever divided, so that any loss of power or sensation from such an injury was as a rule only a temporary trouble. It was impressed upon me that this "merciful" bullet is so easily tolerated by the tissues and so generally "harmless" in its disposition that its extraction was not, as a rule, a necessity, and in fact seldom indicated; and, lastly, that the muscular and other tissues were so little bruised and lacerated that primary union was practically uninterfered with.

Some of these views are held by high authorities. Sir William MacCormac, in one of his graphic reports of some cases he witnessed in the early part of the campaign, has emphasised the remarkable manner with which Mauser bullets penetrate bones and other tissues without inflicting any very serious damage. He observes:

I saw a large number of injuries inflicted by the Mauser bullet, which is remarkable for the small external wound it produces. In three-fourths, if not a larger proportion, it was impossible to tell the exit from the entrance wound, they were so similar in appearance.

He mentions, also, several cases of perforating wounds of bones, of the chest and abdomen, from which the patients, as a rule, made surprising and rapid recoveries.

Mr. Treves, too, has given similar testimony, and in his interesting account of the battle of Spion Kop,¹ observes: "Very few amputations are required for Mauser wounds." Mr. Dent has written against the practice of bullet extraction, and I might also mention others who advocate the desirability of a "masterly inactivity" in this department of surgery.

LATER SEPTIC INFECTION OF WOUNDS.

My experiences acquired in the Maritzburg military hospitals and in the General Hospital, Mooi River, which latter has been the chief arena for my work, compel me to hold opinions on these questions which largely differ from the views above alluded to; and this I believe to be due to the fact that the character of the gunshot wounds in the earlier part of the campaign differed materially from those which I have observed of late, and the increased gravity of the wounds dealt with has been accompanied with increased difficulty in keeping them aseptic.

This change is probably due to two principal causes.

First, the frequent conversion by the Boers of the Mauser bullet into an expanding one, by either removing a small portion of the case from the apex of the bullet, thus converting it into a "soft-nosed" one, or by making longitudinal slits round the case. When recently at Ladysmith I got ample evidence of the means which were adopted by the enemy to increase the gravity of the wounds they inflicted.

Secondly, another cause for the greater severity of the wounds observed of late is that the ranges have been much

closer than they were formerly, and it is clearly established that the closer the range the more serious is the injury likely to be.

I have been informed by Lieutenant-Colonel Crofton, who commanded the Royal Lancaster Regiment at the battle of Greenhill on February 23rd, an engagement which lasted 36 hours, that, especially during the fighting at night, the opposing forces were at very short distances, and consequently the wounds received on that occasion were of exceptional gravity. The difficulty of maintaining asepsis in the wounds which I have experienced of late is probably due not only to greater bruising and laceration of the tissues when wounds are inflicted at short ranges, but also to the fact that towards the end of a campaign the depressing effects of protracted exposure, cold, physical exhaustion, excessive heat, and often hunger, must militate largely against primary union.

It has not, I think, been yet distinctly proved that the Boers have employed explosive bullets. If they have done so it would largely account for the great severity of many of the wounds that I have recently observed, a condition not seen in the earlier period of the campaign. To discuss all the cases I have had under my care which would strengthen my contention that we must abandon the idea that the Mauser bullet is "harmless" and "humane," would clearly be beyond the scope of this communication. I shall confine myself, therefore, to some of the cases of Mauser bullet wounds which it was deemed necessary to treat by amputation.

CASE I. COMPOUND COMMINUTED FRACTURE OF THE FEMUR: AMPUTATION AT THE HIP-JOINT: RECOVERY.

Private N., of the Gloucester Regiment, was wounded in the left thigh during a sortie from Ladysmith at Waggon Hill on January 6th, 1900. The entrance of the wound was in front of the left thigh, about its middle. The exit wound was in the back of the thigh in its upper third. The bullet track was quite external to the vessels and passed through the femur. The patient was under treatment in the Intombi Hospital, near Ladysmith, until his removal to the Mooi River General Hospital on March 25th. On examination I found portions of the upper fragment displaced forwards and outwards, and communicating with the anterior wound, which was freely suppurating. The upper extremity of the lower fragment was protruding for fully an inch and a half through the posterior wound. The patient was in a state of extreme emaciation, and anæmia and hectic symptoms had developed. Notwithstanding the critical condition the patient was in, I thought an attempt might be made to save the limb, and that the ends of the bone at the seat of fracture might possibly be resected and sutured. I accordingly removed the upper extremity of the lower fragment, which was protruding posteriorly, but on enlarging the incision upwards to reach the upper fragment I found the comminution so extensive, extending to the cervix, the bone at that situation being literally pulverised, that I deemed any attempt to save the limb obviously out of the question. I removed the limb at the hip-joint by a modification of Furneaux Jordan's method of amputation making a somewhat racquet-shaped antero-external flap. The patient very nearly sank during the operation, but by means of hypodermic injections of strychnine and ether he rallied somewhat, and I was enabled to complete the operation. To my great surprise and pleasure the patient made a satisfactory and rapid recovery, the extensive wound healing by first intention. On the fifth day after the operation the temperature became normal, and continued so until his recovery was complete.

The result obtained in this case contrasts favourably with those obtained in two other cases in which I performed amputation at the hip-joint, both of which unhappily terminated unfavourably. The injuries in both of these, however, were inflicted by shells, and were of exceptional severity, and, in fact, the operations were nothing more than "last resort" procedures. I do not give the details of them, as the injuries having been shell wounds hardly bear on the subject of this communication.

CASE II. COMPOUND COMMINUTED FRACTURE OF BOTH TIBIA AND FIBULA: GREAT LACERATION OF SOFT TISSUES: SUPRA-CONDYLOID AMPUTATION OF THE THIGH: RECOVERY.

[From Notes by Sidney Hulke, F.R.C.S.]

Private R., of the Queen's Regiment, suffering from a severe gunshot wound of the left leg was admitted into hospital on February 12th, 1900. Both bones of the left leg were extensively comminuted, and the tissues, both on the antero-external and internal surface, extensively lacerated. His condition generally was very unfavourable; his temperature was 103.4° and the pain he suffered very great. He was quite unable to bear any manipulation of the injured limb without an anæsthetic. For a few days, in the hope of being able to save the limb, attempts were made to keep the fractured bone in position and get the wound into a healthier condition, but on February 17th it began to be clear that these efforts were unavailing. The position of the bones was found very unsatisfactory and pus was pouring from both wounds, which were rapidly coalescing. On February 20th I determined that amputation would give the patient the best chance of preserving life. As there was a suspicious blush of redness and sloughing spreading up the leg towards the knee, I at first thought that amputation above the knee at the lower third of the thigh would be the best operation to perform. But, strengthened by the opinions of the

eminent surgeons who kindly attended and assisted me at the operation, notably Colonel Clery, P.M.O.; Professor Watson, of Adelaide, Australia; Mr. Dent, of London; Major Freyer, R.A.M.C. and Mr. Hulke, F.R.C.S., who kindly undertook the after-treatment of the case, I performed a supra-condyloid amputation and the result fully justified the selection of this method. On February 24th the wound was closed. The general condition of the patient was much better and the wound appeared healthy. On February 27th the stitches were removed. The wound was united except at one point. His general condition was very good and he felt no pain or annoyance of any kind. The wound had practically healed by first intention.

The result in this case was most satisfactory, and towards the end of March the patient returned to England in perfect health. I have rarely seen a more shapely stump or one better adapted for the subsequent adjustment of a mechanical prosthetic appliance. The result was gratifying to me, as, so far as I am aware, it was the first instance in which this operation was performed in South Africa. Major Westcott, R.A.M.C., lately in charge of the Intombi Hospital, Ladysmith, has recently informed me that he had another similar case, the result of which was also most satisfactory.

The following case, in which amputation at the hip-joint was performed by Major Freyer, R.A.M.C., presents many features of exceptional clinical interest.

CASE III. MAUSER BULLET WOUND OF THE THIGH FOLLOWED BY THE FORMATION OF A LARGE ANEURYSMAL VARIX IN UPPER PART OF THIGH: LIGATURE OF THE COMMON FEMORAL AND SUPERFICIAL FEMORAL BELOW TUMOUR IN HUNTER'S CANAL: GANGRENE: AMPUTATION AT THE HIP-JOINT: RECOVERY.

Lance-Corporal W. R., and Battalion Fusiliers, was wounded at Pieter's Hill on February 24th, and transferred to the General Hospital, Mooi River, on March 15th. In stooping to assist a comrade, he received a Mauser bullet wound, the bullet entering on the outside of the left knee-joint, and emerging on the inner side of the buttock, close to the ischial tuberosity. This was followed by the formation of an aneurysmal varix about the size of a hen's egg, about $\frac{1}{2}$ inch below Poupard's ligament, and rather to the outside of the femoral vessels. From the direction of the wound and the early symptoms the artery was supposed to be damaged at the upper end of Hunter's canal. Mr. Stanley Copley, F.R.C.S., who had charge of the case in the first instance, operated, and placed a temporary ligature on the common femoral artery first, and then a ligature on the superficial femoral in Hunter's canal on the distal side of the tumour. On account of the close proximity of the tumour it was found impossible to reach the upper end of the superficial femoral, and so he had to close the ligature on the common femoral. I was much impressed with the care and skill that were displayed in the performance of both these operations. Next day I was unfortunately called away to Maritzburg to see and operate on an officer who had sustained a severe injury of the right hand necessitating amputation. While at Maritzburg I was grieved to learn that two days after the ligation operations above mentioned gangrene supervened, rendering amputation at the hip-joint necessary. This was done by a modified anterior-raquet-shaped incision in consequence of the gangrene encroaching too much on the anterior and inner sides for flaps to be taken in those situations. It is most satisfactory to note that the patient has made an uninterrupted recovery. An examination of the amputated limb showed that the wound in the vessels was not at Hunter's canal, but much higher up, within $\frac{1}{2}$ inch from the bifurcation of the common trunk. The deep femoral vein was also found opening into the varix.

CASE IV. EXTENSIVE COMPOUND COMMUNED FRACTURE OF TIBIA AND FIBULA: TEALE'S RECTANGULAR FLAP AMPUTATION OF THE LEG: RECOVERY.

Lieutenant H. received a severe gunshot wound of the lower third of the left tibia and fibula at the battle of Spion Kop. He came under my notice on March 2nd, and a skiagraph, taken by Lieutenant Blackwell, R.A.M.C., exhibited not only the presence of a bullet, but also severe comminution of both tibia and fibula. On March 4th, assisted by Major Hackett, R.A.M.C., I succeeded in removing three pieces of a Mauser bullet, as well as several small pieces of bone. The patient was pale and anemic, and of nervous temperament, but having regard to his youth, I thought at first that the limb might be saved. These hopes were, however, doomed to disappointment. Very profuse suppuration, notwithstanding the most diligent and careful antiseptic treatment which was carried out by Major Hackett, set in. As the case was becoming critical, and obviously going from bad to worse, amputation was, in my opinion, clearly indicated, and this, with the concurrence of Colonel Clery and Major Hackett, I performed on March 12th. At my suggestion the patient was removed from the officers' wards, a building formerly an hotel situated on the south side of the Mooi River, and brought over to the camp on the north side of the river and placed under canvas. I amputated the limb a little below the middle of the leg, adopting Teale's rectangular flap method. I had to make the long flap somewhat external in order to avoid the wounded tissues on the antero-internal aspect of the limb. The patient made a slow but, on the whole, satisfactory recovery, and returned to England on April 7th, travelling to Durban in the admirable ambulance train organised by H.R.H. the Princess Christian, and directed by Sir John Furley.

CASE V. SEVERE BULLET WOUNDS OF THE SHOULDER, THIGH, AND LEG: COMMUNION OF TIBIA AND FIBULA: AMPUTATION AT THE "PLACE OF ELECTION": RECOVERY.

Lieutenant B. was wounded on February 23rd at Railway Hill. When he reached the summit he received a bullet on the top of his right shoulder, which passed backwards and downwards, emerging at the inner side of the scapula. While lying on the ground faint from shock and loss of blood he received a second bullet wound in the left leg about

its centre, shattering both tibia and fibula. The range was about 250 yards. An hour afterwards he received a third bullet in the upper and external aspect of the thigh; this bullet has not been extracted. The unfortunate officer lay for thirty-seven hours on the battlefield, during the greater part of which the heat was intense and not a drop of water to be had. Some kindly-disposed Boers at last gave him some relief to his intense thirst, and shortly after he was brought to Hlangwane Field Hospital, where in an operation tent on the right bank of the Tugela several pieces of bone were removed. He was then brought to Colenso, and arrived at the hospital at Mooi River on February 27th. On his arrival he was, as might be expected, in a state of extreme exhaustion; and, although it was obvious, from the great comminution of the fractures, that the limb would have to be removed, I deemed it wiser not to operate at once but to wait till the following day. Accordingly, on February 28th, assisted by Major Freyer, R.A.M.C., I removed the limb at the "place of election," adopting the method known generally as Ferguson's by a short anterior and long posterior flap made by transfixion. The convalescence of the patient, owing doubtless to his previous exposure and suffering, his extreme prostration, debility, and nervous temperament has been very slow. He has suffered much also during the healing of the wound from periostitis of the upper part of the tibia; but, notwithstanding these complications, he has progressed steadily, and will leave shortly for England. In the limb that was removed I have seldom seen greater comminution. In truth pulverisation of the bone would best describe the condition.

CASE VI. COMPOUND COMMUNED FRACTURE OF TIBIA AND FIBULA: AMPUTATION AT UPPER THIRD OF LEG: GANGRENE OF STUMP: REAMPUTATION OF THE THIGH BY TEALE'S RECTANGULAR FLAP METHOD: RECOVERY.

[From Notes by Dr. W. R. Kemp.]

Private B., King's Royal Rifles, aged 23 years, was wounded by a bullet on February 23rd at the battle of Pieter's Hill. He lay for two days on the battlefield, having no food and very little water. He was at last rescued from his perilous situation and brought to the 4th Brigade Field Hospital, where the injuries to both bones of the right leg were found to be of so serious a nature as to necessitate amputation at the upper third of the limb. On February 27th he was transferred to the General Hospital, Mooi River, where he arrived in a very critical condition. The flaps of the wound had suppurated, exposing a large sloughing surface, from which there was a most offensive discharge. The temperature was 102.6°, the tongue was furred, he had great headache and much pain in the stump, which was greatly aggravated at night. For three days attempts were made to improve the condition of the patient both locally and constitutionally. The wound was douched twice daily with warm carbolic lotion, dusted over with iodoform, and dressed with cyanide gauze soaked in carbolic lotion. Internally he was given mercury bichloride, quinine, and strychnine, diffusible stimulants, and a light nourishing diet. After three days of this treatment, there being no sign of improvement, I deemed it necessary to reamputate the limb above the knee-joint, which I did on March 3rd by Teale's rectangular flap method. The patient bore the operation well; there were no signs of septic changes taking place in the new flaps, and the temperature subsided to the normal standard three days after the operation. On March 13th I removed three stitches, as, owing to the usual retraction of the hamstring muscles, there was some tension and a slight discharge from the neighbourhood of the stitches. These were all removed on March 16th. From this date the patient's condition improved in every way without any intermission. The stump felt comfortable, and a more shapely one could not be seen, and the patient was able to leave for England on April 6th in good health and spirits.

CASE VII. COMPOUND COMMUNED FRACTURE OF THE HUMERUS: MODIFIED CIRCULAR AMPUTATION OF THE ARM: RECOVERY.

[From Notes by Dr. A. Stoddart Maunsell.]

Private G. C., aged 30, of the Royal Dublin Fusiliers, was wounded at the battle of Pieter's Hill on February 26th, 1900. The bullet passed through his right arm, fracturing the upper part of the humerus in several pieces. Two pieces of bone had already been removed in the field hospital at Colenso. On admission to the General Hospital, Mooi River, two open wounds were found, one on each side of the upper third of the arm. Both wounds were discharging freely, and the arm was greatly swollen. There being no evidence of any septic complication, an attempt was made to save the limb, but an admirable skiagraph was then taken by Lieutenant Blackwell, R.A.M.C., displaying such comminution of the bone that I decided the limb should be removed. It was a painful decision to be obliged to make, having regard to the fact that the injured limb was the right arm. On March 10th I amputated at the junction of the upper with the middle third of the arm, the operation I adopted being a modified circular method. The condition of the tissues at the middle and lower thirds of the limb precluded the possibility of doing any lateral or antero-posterior flap method. The wound healed by first intention, and the patient left for England on April 6th.

CASE VIII. COMPOUND COMMUNED FRACTURE OF THE HUMERUS: AMPUTATION AT THE SHOULDER-JOINT: RECOVERY.

[Under the care of Major Freyer, R.A.M.C.]

Private S., 2nd West Yorks, was wounded at the battle of Pieter's Hill on February 27th, and transferred to the General Hospital, Mooi River, on March 3rd. A Mauser bullet at a short range (500 yards) entered the left shoulder at the tip of the acromion and emerged at the inner and posterior surface of the arm at the juncture of its upper and middle third. There was great swelling and profuse suppuration from the wounds. Under the impression that a resection of the shoulder-joint might be performed, and the limb thus possibly preserved, a Langenbeck-Ollier straight incision $4\frac{1}{2}$ inches in length was made midway between the coracoid and acromion processes, but the upper third of the humerus was found so pulverised by the Mauser bullet that resection was abandoned, and a large deltoid flap being made the limb was removed. It is pleasing to record that the patient made an uninterrupted recovery, and has returned to England perfectly well.

I might adduce many other cases in proof of the fact that

my recent experiences at all events tend to show that the Mauser bullet is not so "harmless," "humane" or "merciful" a projectile as some suppose it to be. But, for the present, the cases noted above illustrate my contention sufficiently well.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, March 3rd, 1900.

NOTES ON GASTRO-ENTERITIS, DYSENTERY, AND ENTERIC FEVER.

[FROM THE IMPERIAL YEOMANRY BASE HOSPITAL, DEELFONTEIN, SOUTH AFRICA.]

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THE diseases most prevalent during the present campaign, if we can judge from the experience of the Imperial Yeomanry Base Hospital, are gastro-enteritis, dysentery, and enteric fever.

PREVALENCE OF INTESTINAL DISEASES.

Almost everyone after arriving on the veld is attacked with gastro-enteritis; for instance, nearly the whole of our medical staff, nursing sisters, and detachments have at one time or another suffered, whilst the prevalence of enteric fever and dysentery is shown by the fact that of the first 650 medical cases admitted here 289 were cases of enteric fever and 158 of dysentery.

The primary lesion in these three diseases is situated in the alimentary canal, and they are without doubt caused by the ingestion of micro-organisms or their products with the food. We know that the bacillus of enteric fever is capable of multiplying in the soil, and it is probable that the same holds good for the micro-organisms causing gastro-enteritis and dysentery.

Flies and Dust.

In military camps it is difficult to prevent infection of the soil with the excreta, and particles of the infected soil or of the excreta themselves can readily gain access to the food by means of flies and dust. The flies are innumerable, and get into every article of food, and after a dust storm everything is covered with a thick layer of dust.

Water.

In addition to these modes of conveyance of infection the drinking water is frequently to blame, coming, as it does, from polluted rivers and surface springs. On the march it is not easy to boil the drinking water, or to prevent flies and dust getting into the food; nevertheless, one cannot help feeling that, if greater precautions were taken, the incidence of disease would be greatly diminished.

GASTRO-ENTERITIS.

The chief symptom of the gastro-enteritis met with here is acute diarrhoea, which is usually painless, but is sometimes attended with colic. In some cases, in addition to diarrhoea, there is severe vomiting. As a rule the temperature is not raised, but it may reach 103° F., though this is never maintained for longer than a day at the most. The majority of cases recover in a couple of days, but diarrhoea may persist for a week or two. The best treatment is a dose of castor oil and laudanum, the diet being restricted to milk. Although more than one attack may occur in the same person, immunity is ultimately established.

Exposure to chill is undoubtedly a predisposing cause, and the wearing of a cholera belt affords some protection. One can easily imagine that vasomotor changes in the intestine may favour infection with microbes or absorption of toxins. In some outbreaks—as, for instance, at Modder River, where the disease was so common as to go by the name of "Modders"—the materies morbi was probably conveyed by the drinking water. The water was badly contaminated, and so turbid that some people actually attributed the disease to the mechanical irritation of the particles of mud. In our own cases the water was not to blame, for two reasons. One patient was attacked between five and six hours after arrival, not having partaken of any water, while an adjoining camp supplied with the same water was not affected.

On the other hand, there was reason to believe that the fresh meat which we received from Capetown was responsible for, at any rate, some of our cases. One of our company who had never partaken of meat was not attacked, while detachments of soldiers some distance from us were exempt as long as they were eating "bully" beef, but were at once attacked when they were supplied with meat from the same source as ourselves.

DYSENTERY.

The dysentery met with here is not very fatal. We have had only 2 deaths out of 158 cases. These cases exhibit the usual symptoms of tenesmus with passage of blood and mucus. Up to the present we have had no case of hepatic abscess. I have examined the stools of a number of cases microscopically, using a warm stage, but have failed to discover amoebæ. In both the fatal cases typical dysenteric ulceration of the large intestine and peritonitis from perforation of the bowel were found.

During the acute stages—that is to say, when there is passage of blood or mucus—the symptoms usually yield readily to treatment with ipecacuanha or with magnesium sulphate.

Ipecacuanha is given in the following way: The patient is kept without food for a few hours. A small dose of laudanum or chlorodyne is then given, and this is followed within an hour by a dose of 30 grs. of powdered ipecacuanha. The patient is kept quite quiet in bed, and is told to endeavour not to vomit. The same dose of ipecacuanha is repeated in four hours.

Magnesium sulphate is administered in 5j doses every hour until the motions become faecal. After the acute symptoms have subsided the diarrhoea generally yields to treatment with opium and bismuth.

The following short notes illustrate the value of these modes of treatment:

CASE I. *Ipecacuanha*.—Private D., admitted April 7th, under the care of Dr. Handson, had been ill a fortnight with dysentery. The bowels acted at first about twenty times a day, and blood and slime were passed. On April 8th the bowels acted ten times, and there was blood in the motions. He was treated with ipecacuanha. On April 9th the bowels acted four times, and the stools contained no blood. On April 10th the bowels acted three times and on April 11th twice, and there was no blood. On April 16th the motions were becoming formed, and on April 20th he was discharged well.

CASE II. *Magnesium Sulphate*.—Private J. W., admitted on May 10th, under Dr. Elliott, had had two attacks of dysentery since landing in South Africa, and was admitted when his second attack had lasted a little over a month. The motions were frequent, contained blood and mucus, and were accompanied by abdominal pain and tenesmus. On May 10th the bowels acted seven times, and on May 11th ten times. On May 12th magnesium sulphate was begun in doses of 5j. Six consecutive hourly doses were given, followed by two others at intervals of two hours. This was followed by a bismuth and opium mixture. On May 13th the bowels acted five times on May 14th twice, and on May 15th once. The patient stated that after the first dose the abdominal pain and "working" ceased, and in twenty-four hours there was neither blood nor mucus in the stools. There was no recurrence of the dysentery.

As a rule, no sequelæ have arisen after dysentery, but in the following case cerebral embolism occurred:

CASE III. *Dysentery, Cerebral Embolism*.—Gunner G., admitted March 26th under the care of Dr. Handson, had been ill six weeks with dysentery, with passage of blood and slime. On admission he was convalescent, but there was still some diarrhoea and passage of blood. This yielded to treatment with bismuth and opium. On April and his temperature rose to 100.6° F., and continued at about this level till April 12th, when it rose to 103° F. On this day the liver was observed to be slightly enlarged and tender. An intermittent temperature, varying between 103° and 98° F., continued till the night of April 25th, when it suddenly rose to 105.8°, but fell within an hour to 97° F. He became collapsed, with feeble pulse, recovering on administration of brandy. Later, he grew restless, shaking his head from side to side, and for a time became semi-unconscious. On the morning of April 26th his temperature was normal, and he was very drowsy. Well-marked paresis was present in the right arm and leg, with slight blurring of the optic discs. From this time he gradually recovered, and there was no subsequent rise of temperature. At the present time (May 21st) he is walking about, but still has some loss of power in the right arm and leg.

ENTERIC FEVER.

The cases of enteric fever run a similar course to those at home. There is the same eruption, pyrexia, enlargement of the spleen, etc. The following short notes will serve as an example:

CASE IV.—Driver S., aged 23, admitted under the care of Dr. Elliott on March 26th, had had an attack of dysentery lasting ten days, from which he was convalescent on admission. The temperature was raised on admission, and after four days the diagnosis of enteric fever was made. The patient passed through a very severe attack, the chief symptoms of which were diarrhoea, active delirium, nervous prostration, and cardiac failure. The highest temperature was 105° F. There were copious spots, the spleen