Notes and recollections of an ambulance surgeon : being an account of work done under the Red Cross during the campaign of 1870 / by William MacCormac.

NOTES & RECOLLECTIONS
OF AN
AMBULANCE SURGEON

WILLIAM MAC CORMAC

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Dedication.

TO MY

COLLEAGUES OF THE ANGLO-AMERICAN AMBULANCE

I DEDICATE

THIS RECORD OF OUR JOINT LABOURS

AS A

TOKEN OF MY AFFECTIONATE RECOLLECTION.

WILLIAM MAC CORMAC.

"Nil actum reputans si quid superesset agendum."

PREFACE.

A CONSIDERABLE portion of this little work consists of communications which have recently been made to the *British Medical Journal*, to whose Editor, when he saw him abroad, the Author had promised to give some account of his surgical experiences at the seat of war. These papers are now reprinted with several additions, along with a few plates representing some examples of gun-shot fractures of the bones.

The author does not purpose to give any systematic account of gun-shot wounds, but simply a record of his personal experience, and the impressions he derived from the rather novel circumstances in which he found himself placed. The form in which it is published is somewhat that of a diary, since he has repeated as closely as possible the expressions which are

entered in the note-book he kept at the time. It cannot be truly said that there is much that is mysterious or unknown to the exoteric surgical world, in either the principles or practice of military surgery, further than this, that the greatest care and tact are oftentimes needed for the accurate diagnosis and prognosis of gun-shot injuries. The external appearances often bear so little relation to the amount of internal injury, that it is sometimes difficult to estimate the actual gravity of a gun-shot wound. Very careful and complete examinations become, therefore, of the greatest importance. Unfortunately, the excellent rules of conservative surgery are largely inapplicable. The author is satisfied that errors may be committed by being too exclusively guided by the experience gained in civil hospitals.

The writer admits having himself fallen into this error. Had he another opportunity, similar to the last, of practising military surgery, he would not yield so often as he did to the temptation of trying to save limbs, the bones of which were seriously damaged by conoidal bullets. It has been said, "'Tis better for a man to live with three limbs than to die with four." If this be true, without a doubt it is also equally true, that the lives of many were lost through

an attempt being made to save their limbs. The author fears that, however reluctantly, he must come to the conclusion that Radical and not Conservative surgery is the general principle of treatment to carry out for severe cases of gun-shot wounds which must be cared for on or near the field. Much will, of course, depend upon the special conditions obtaining in each campaign, such as the general *physique* and *morale* of the soldiers, the previous hardships which they may have incurred, and the means that are available for the efficient treatment of their wounds.

The writer can unhesitatingly say that, but for the volunteer aid furnished not merely by the belligerents but by the large-hearted liberality of neutral powers and especially England, the sufferings and misery of this terrible war would have been augmented tenfold. Those who say such aid should be withheld, that the large sums which England in her generosity so freely gave have been mis-spent, and that it but assisted the belligerents to prolong the fight, base their conclusions, I cannot but think, on somewhat harsh and narrow-minded premisses, premisses which the sterner logic of the appalling suffering on the actual scene of battle, could they only realize it, would soon cause to melt away.

The National Aid Societies have supplied a most pressing want, and their assistance will be eagerly sought after in all future wars. No one imagines that nations will offer battle to each other more readily because such organizations exist, and it is just as far from the fact that their operations can in any appreciable manner affect the duration of a campaign. The experience gained during this war can only serve to increase their usefulness, as it must tend to remove any imperfections that may have been observed in the working of National Societies for affording Succour to the Sick and Wounded.

The plates at the end of the book are executed by a new method called Heliotype, which combines the absolute accuracy of a photograph with the durability, and almost the cheapness, of ordinary printing in ink. The fidelity and beauty of these illustrations speak sufficiently for themselves, as well as for the skill and ability displayed by Mr. Ernest Edwards, inventor of the process by which they have been carried out.

THE AUTHOR.

13, Harley Street, London, W.,
April, 1871.

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CHAPTER I.

Being anxious to see what military surgery was like, I started from home, for Paris, almost immediately after the declaration of war, not knowing exactly what I might be able to do, or whether my services would be accepted or not.

My first visit in Paris was to the Palais de l'Industrie, in the Champs Elysées, erected as a symbol of universal peace, but now having its large area filled, partly with cannon, and partly with immense stores and supplies of all kinds for the wounded. The French National Society for Aid to the Wounded had established itself here, under the presidency of the Comte de Flavigny, along with M. Chenu, so well known as a writer on military surgery and hygiene, as its medical director.

The first intelligence I here received was,

that no foreign surgeons would be permitted to serve. Some days afterwards, however, Nélaton returned from head-quarters at Metz, bringing back with him the Emperor's express sanction and welcome to such English and American surgeons as might offer their aid. But after that, time was required to settle where the applicants were to go, and it was not for several days that I received my *feuille de route* for Metz, with orders to serve in the hospitals there, and to report myself to Dr. Isnard, Surgeon in Chief.

Accordingly, I left Paris this evening, August 9th, at ten minutes to eight, for Metz. We had many stoppages on the way, and did not arrive in Metz till seven o'clock on the morning of the 10th. At short intervals, all along the road, we passed long trains containing horses, cattle, *vivres* of all descriptions, and, on arriving at Metz, we were stopped about a mile outside the town. Several trains were in front. After waiting nearly an hour, and seeing no hope of progress, I got down, and, taking my bag in my hand, walked into the town. Along the line were heaped up boxes of comestibles, bales of hay, bags of oats, artillery ammunition, all sorts of supplies. On the meadows outside were encamped masses of troops, both infantry and cavalry. Close to the station were the hand-

some carriages of the Imperial train. After leaving the railway, I soon reached the fortifications, which are of immense strength, and surrounded by two deep ditches, over which we crossed by drawbridges, and were then in the *enceinte* of the strongest fortified town in France. Metz has several times been besieged, but never taken. It is now stronger than ever; and all round its walls, as well as in the surrounding forts, of which there are many, are placed the very largest and most powerful guns. There is little probability that the Prussians will besiege the place, but if they do, they will find it a hard nut to break.*

Metz, August 10th, 1870. — In front, about fifteen kilometres distant, is the *corps d'armée* of Marshal Bazaine, which contains at least 130,000 men, of whom 50,000 have not yet been in action. They await the Prussian assault, and, as it will be the first time the French and Prussian soldiers have met in any-

* In my diary I have written, "The fortifications of Metz are of the most stupendous kind. It seems, to look at them, that it would be perfectly impossible for any enemy to gain an entrance, even with the new weapons of attack. There are three lines of earthworks, with deep broad ditches between, and the Moselle flows in and around the town in such a way as to give it most efficient protection as well. It might be starved out, but could not be taken. It has, in effect, never been taken, and goes by the proud name of *Metz la Pucelle*." It can boast this name no longer now.

thing like equal numbers, the result is awaited with much interest, and, apparently, but little anxiety. Everyone here is sanguine. Indeed, the contrast between the tone of this place and that of the capital is remarkable. I left Paris on the eve of the assembling of the Corps Législatif. The previous three days had been spent in a state of the most feverish excitement. All along the boulevards, dense crowds were assembled. The air was surcharged, as it were, with electricity, and one awaited, every moment, an explosion. Yesterday afternoon the Place de la Concorde and the Pont Royal, in front of the Palais du Corps Législatif, were filled with people, and it was difficult to imagine what might ensue. In fact, the military had to be called upon to preserve the peace. Crowds also besieged the Ministère de l'Intérieur, asking for news, demanding arms. In short, there seemed to be more danger to the French Government from the condition of Paris, than from the enemy in front. On that day, indeed, the Ollivier ministry, which promised so much, and did so little, for France, resigned, and Count Palikaõ formed a new Government.

Here, in the great frontier fortress, all appears different. I am staying in the Hôtel de l'Europe, amidst a crowd of soldiers, marshals and generals covered with bullion lace and numerous

orders, and officers of every grade beneath. No disquietude prevails. All that the French soldiers desire, say the officers, is an opportunity of fighting with the enemy on something like equal terms. An engagement was expected to-day, but there has been none. I did not notice any tall talk, but a sincere conviction was found to exist, without being noisily expressed, that the French arms would ultimately be victorious. It must be remembered that these were the real soldiers of the French army, most of whom knew what fighting was.

With the recommendation of M. le Dr. Chenu, Directeur de la Société de Secours aux Blessés, I went to M. Isnard, médecin militaire, Médecin en chef des Hôpitaux de Metz.

He was most kind and courteous, entered willingly into my views, and promised me a place beside himself, in charge of one of the pavilions of the large temporary hospital which was in course of construction on the artillery practice ground, just outside the fortifications of Metz. It is constructed on the plan of the General Hospital at Lincoln, U.S.

Destined to accommodate 2,000 sick, and arranged in a triangular fashion, it consists of pavilions containing fifty beds each. The offices and the operating theatre are in the centre, while a covered way goes all round. The pavi-

lions themselves are one story high, and raised some few feet from the ground.

Besides this vast hospital, there are others, civil and military, and in all 5,000 beds are arranged here for the reception of the sick and wounded.

After leaving Dr. Isnard, and by his advice, I went to the Mairie, when M. le Maire, an *ancien médecin*, gave me a formal written permission to dwell in Metz, and a very necessary permission this proved. All strangers had been absolutely turned out. A gentleman from a London hospital, who came as representative of a medical paper, told me, very indignantly, that he had arrived only that morning, had been twice put under arrest, and finally ordered by the provost-marshal to quit the place immediately. He left this very evening, the day of his arrival. All the English and French journalists have been turned out. It is said they are gone to Nancy.

So far only about five hundred wounded have arrived here, but if the great battle be fought which is expected, the place may become immediately filled up.

Dr. Isnard was in command of an ambulance corps during the Italian campaign, and has had a very large experience of military surgery. He explained to me an ingenious means of treating gunshot fracture of the thigh, whereby,

he alleges, shortening can be almost entirely obviated, besides other surgical contrivances.

Such are a few of the incidents which I have thought worth noting on this the day of my arrival at the seat of war. "It is curious," I have written, "to watch the soldiers here on the eve of battle, carrying their life in their hands. They talk seriously together for the most part. They evidently feel the drama is not one to laugh at, and yet they seem quite confident, in spite of the serious reverses which the French arms have sustained. I feel not a doubt but that French soldiers, if properly officered and fed—and there it is that the want has been—will retrieve all their lost glory, if they have lost any. To sustain a long fight against overwhelming numbers, even until their ammunition became exhausted, is no great or irretrievable defeat. The French soldiers at Weissenburg and Wörth fought like lions, but they were beaten in detail. Adequate generalship was sorely wanting. That may now perhaps be changed. Marshal Bazaine, of Mexican renown, commands. Will he lead his troops to victory? *Nous verrons.*"

These words were written at the time in the fortress of Metz itself, and when, had the right man appeared to command the soldiers of France, the future campaign might have proved very different. Intimate relations with the French during some three months of the war have served

to convince me that the French are very brave. Everything that has since happened only tends further to establish this opinion. But when men are neither officered nor fed, but led half starving to a shambles, it is hard for them to win. The mismanagement and incompetence, coupled with downright ignorance, which prevailed in high places in the French army, were something extraordinary.

Metz, August 11th, 1870.—This morning, between seven and eight o'clock, I went to visit the military hospital of Metz. It is an immense building in separate blocks, calculated in time of peace to accommodate 800 patients, but the number is now reduced to 630 beds. The wards are large, each accommodating from fifty to eighty beds. In the larger wards there are four rows of beds between the windows. There were there about 250 wounded from Forbach and Saarbrück. I also visited the tobacco manufactory, which is at present utilised for a hospital. In it there are 600 beds, and about 200 wounded. The men with the slighter wounds are sent off as fast as they can be transported to Paris, and to hospitals in the interior, in order to have as much room as possible for a sudden accession of wounded.

A great battle is expected every moment, most

probably to-morrow, between this and Thionville, and both the Prussian and French armies are collected in great force at this point, about fifteen or sixteen kilometres distant. All the troops are in excellent spirits, and are eager to meet the enemy. They appear not in the slightest degree disheartened by the disastrous encounters of Weissenburg and Forbach, the results of which are alone attributed to the overwhelming forces of the enemy. The idea seems now to be to allow the Prussian troops to advance into French territory, to surround them, and not to allow a man to escape. A French captain of scouts told me the Prussians were very badly off in the commissariat department, and that the tactics of the French generals were to prolong the war as much as possible, since the enemy could not continue the struggle for very long. It was this system of self-deception, and the habit of trying to deceive every one else as well, that has aided so effectively in producing the most complete military collapse ever witnessed in the world.

I became acquainted with M. Hermann, Médecin en chef de l'Hôpital Militaire de Metz. He invited me to accompany him in his hospital visit, which is from six a.m. till ten a.m., and also from three p.m. till four p.m., to see any new arrivals.

The military hospital has two surgeons of the

first class, M. Hermann and M. Hanard. I there saw a large number of wounded. For the most part, however, the injuries were not serious. It was extraordinary to see how balls would traverse limbs from one side to the other, and yet not injure either the bones, the important vessels, or the nerves. I saw several wounds *en pleine poitrine*, and yet the ball had not penetrated the chest. In many cases there was a long tract as if burnt by a hot iron, a black and contused channel. I saw one, for example, extending beneath both clavicles from one side of the chest to the other. I saw two or three similar channels running along the back, many inches in length, and grooving the surface for three-quarters of an inch deep. In several other cases, the ball ran beneath the skin *en seton*, for various lengths. What surprised me was the complete absence of serious wounds, although the distance required to transport the wounded was but trifling, and the means of transport ample. One man had been struck by a ball which passed through both buttocks, making four large openings. Another was shot in the foot, the ball traversed the shoe and passed between the tendon Achilles and the back of the astragalus and ankle joint. I was astonished at the number of soldiers who had got the end of their forefinger shot off. I suppose there were nearly two dozen. Mostly it was the forefinger of the left hand.

The number of these wounds was so great as almost to suggest the explanation that some of them were self-made. But be that as it may, the fact remains the same that there they were.

As to the surgical treatment, it was of the simplest kind. A mass of charpie was applied to the wound, and a bandage. M. Hermann makes considerable use of *l'acide phénique*. All the water he employs in bathing the sores is *phéniqué*, and, on the whole, they looked very well. There was hardly any inflammation or general fever to be seen in any of the patients.

M. Isnard has received no wounded as yet, but if the engagement, which is expected to-morrow, take place, there will be employment for every one. You may be sure I was in a state of anxiety for work. Metz itself is in great excitement. It is, of course, in a state of siege, and M. le Général St. Sauveur is Prévôt-Maréchal. The utmost suspicion prevails in respect of everybody. Prussian spies have already obtained great advantages for the enemy by their cleverness, and anybody may be arrested at any moment. An artillery officer, an inhabitant of Metz, was arrested yesterday. The captain of scouts, of whom I spoke just now, was required to prove who he was, while sitting at my side in the court-yard of the hotel. The proprietor of the hotel also was arrested, and an unlucky *contretemps*

happened to myself. I was so unfortunate as to speak a casual word to an American sitting near me at the *table d'hôte* last night, and this morning I was requested to attend at the Prévôt's office. Fortunately, my papers were in every way satisfactory, and M. Léon le Fort, chief surgeon of one of the ambulances, who came in, assured them it was all right, but he gave me the advice at the same time to leave Metz by the first train, an advice which was endorsed by the officers of the Prévôt in such a way as to be equivalent to an order. Unless you go, they said, you will be exposed to all sorts of inconvenience, perhaps to something worse. In fact, they said, we cannot have foreigners here, no matter in what capacity. I must add, that so soon as I proved who I was, these gentlemen were very polite, and said, with many excuses, they were obliged to take the excessive precautions they did. The circumstance of speaking to this stranger had made so slight an impression on me, that I was unable to recollect it, and it must have been by the merest accident. But it appears this man was strongly suspected of something or other bad. The gates of Metz will probably be closed to-morrow, and no one afterwards permitted to leave. I had lost any great desire to remain in a place where I had received such scant welcome, after coming solely to aid the sick and wounded. Under the

circumstances, the accident was perhaps fortunate which enabled me to go away just in time. As it is, no one is allowed to enter Metz who does not bring forty days' provisions with him, and the condition of the people arriving from the villages in the neighbourhood of the battle-grounds is terrible. They have come near the walls of Metz to be under the shelter of its guns, and line the roads all about. They have no money, and little or no food, they are turned out of house and home, they are not allowed to enter the city, the weather is fearfully bad, and it rains in torrents night and day. Without food, without cover, in a state of most fearful anxiety and distress, what is to become of these poor villagers? Such are some of the horrors of war, of a war, too, only just commenced. If it last, ruin and misery must spread everywhere.

The Emperor is still at Metz, and so was the Prince Imperial, yesterday at least, although it was announced everywhere that he had returned to Paris. Everything is pretty quiet, no demonstration, talk, or noise such as that which followed the small affair of Saarbrück. The soldiers evidently mean to accomplish great things, if possible, and the officers as evidently entertain no doubt of their ultimate and decided success.

I was yet loth to leave, although angry at being treated as I had been. Plenty of work was

expected, and there were far too few to do it. M. Isnard was indignant, but there was no help for it, go I must. So accordingly I left Metz the same evening. The train should have started at seven o'clock, but it did not get under way for three-quarters of an hour after, an augury of what was to follow. We slowly steamed away, past the men encamped under their *tentes d'abri*, out through the fortifications, and passing for miles on either side of the main rails long lines of railway waggons and carriages in sidings. Many of these were afterwards converted into hospitals, and served the purpose very well. All the way from Metz to Châlons, which we did not reach until two o'clock next day, long trains, slowly drawn by two and three engines, passed us at intervals. I counted some of them, and the number of carriages was forty-five and fifty. These trains brought troops, horses, cattle, munitions of war, and artillery of all sizes, to the front. In fact, the amount of war *matériel* passing us was almost incredible. Our journey was a long and tedious one. We had to stop about three hours at Frouard, the junction to Nancy, and four hours were consumed outside the station at Bar-le-Duc. Our own train was a very long one, being composed of thirty-seven carriages, drawn by two huge engines. The only incidents of the journey were a demand

to see my papers, which were churlishly admitted to be satisfactory, and the arrest of two persons supposed to be spies. One of them was habited as a *curé*, the other was a queer-looking man who came into our compartment at the off-side twice, as he alleged, by mistake, whilst the guards of the train were looking at tickets. It was supposed he was trying to avoid inspection, but he ultimately failed.

Generally the delay was caused by other trains in advance, as many as three often stretching along the line in front of ours, and there were other trains behind us. The stoppages were continual, and the loud whistling kept up by the two engines, as if in rivalry one of the other, was something surprising. To make a long story short, we only reached Paris at nine o'clock in the evening, twenty-six hours after the time of starting, and sixteen hours late, the journey being usually one of but ten hours at the most.

Amongst our *compagnons-de-voyage* was an unfortunate lady, the wife of the colonel of the 8th regiment of infantry. She had heard, by mere accident, that her husband had been wounded at Forbach, and she had come to Metz to try to discover him, but could get no news whatever, and was now returning to Paris, travel-worn and exhausted, intending to get into Bel-

gium, and thence obtain a passport for Prussia, in the hope of finding her husband amongst the prisoners. Another fellow-traveller was a doctor who, after being four days in the saddle, getting no food or comfort of any kind, and exposed to bad weather, broke down, and was returning to Paris invalided. He had been at the affairs of Wörth and Weissenburg, and said the havoc on both sides was fearful, but the number wounded and killed on the Prussian side he estimated at three times the number of those on the French. It was probably exaggerated, but the mitrailleuse, he said, "faisait tomber les hommes comme des mouches." He watched them, he told us, through his glass. A poor Zouave who spoke to us was nearly crying, all his comrades, he said, were gone, not half-a-dozen remained. Many of the missing may, doubtless, afterwards turn up, but the carnage was terrible. We saw a corporal of the 60th Infantry marching lightly along to Châlons. He told us he was one of 312 out of a regiment of 3,000 strong. Yet he was marching manfully along to await the reconstruction of his corps at Châlons, just as if nothing very remarkable had occurred. The day after I left, as I believe, in the last train, Metz was cut off, and the communications with Paris were at an end, the fortress was invested, and the Emperor had

left for Verdun, the first stage of his disastrous series of retreats.

The mental effect produced on one by the exaggerated dread of spies on the part of the French was most unpleasant, nay demoralizing. In spite of yourself you experienced a sort of conscious guilty air. You felt as if at each moment some one might demand fresh explanations, and you became afraid even to address or look at anybody. The vaguest suspicion is considered tantamount to proof that you are in the service of the enemy, and a mistake once made may be difficult afterwards to rectify. The only consolation I received was when I subsequently learnt that the Prévôt-Maréchal himself had been arrested by one of his own gendarmes, and brought in triumph to the Prefecture as a spy.

Thus terminated, through no fault of my own, an effort to serve the French in their need at Metz. How great that need proved, how fearful were the sufferings entailed by the siege, are things now only too well known.

CHAPTER II.

I WAS unwilling to relinquish the struggle without some further effort, and had an opportunity of making another trial through the kindness of my friend, Dr. Marion Sims, who had been invited by the Americans in Paris to place himself at the head of an ambulance corps, consisting of Americans, for service in the field.

Through a difference of opinion as to where the staff of this corps could render most efficient service, considerable delay ensued, and in the end the American surgeons were unable to take with them to the field a collection of the most complete kind, in stores, tents, and surgical appliances, which the generosity of the American citizens in Paris had provided. Just at this juncture Dr. Frank arrived as a plenipotentiary from the English Society, with plenty of money, and stores in profusion. The tide of war was rolling on, our staff was chafing at the inaction to which they were reluctantly condemned. A joint meeting of English and

American surgeons was held, and it was then and there unanimously determined to start at the earliest moment for the seat of war.

I cannot, perhaps, do better than quote some passages from Dr. Sims's able Report, addressed to Colonel Lindsay, which bear on this and some other points :—

"*Sedan, September 25th*, 1870.

"COLONEL LOYD-LINDSAY,

"Sir,—Wishing to return to New York early in October, I have resigned my position as Surgeon-in-Chief of the Anglo-American Ambulance into the hands of Dr. MacCormac. I, therefore, feel it to be my duty to make you a statement of our doings at Sedan and its neighbourhood. I shall confine myself to our internal organization and general hygienic condition, leaving the special surgical report to our principal surgeon, Dr. MacCormac, who performed most of the operations. He will, in due time, furnish such a report as will, I am sure, do credit to himself, to the profession, and to the Anglo-American Ambulance.

"The Anglo-American Ambulance has a little history of its own. The Americans in Paris appointed a Committee at the beginning of the war to organize an ambulance. This Committee invited me to select a staff of American surgeons

for this purpose. I accepted the invitation, and organized the staff. When we reported ourselves ready to go forward to the seat of war, the Committee suggested that we should set up our tents in Paris, and await the coming of the Prussians. The surgeons unanimously opposed this proposition, insisting that our organization was for the purpose of giving aid and succour to the sick and wounded on or near the field of battle. The Committee was obstinate, the surgeons were no less determined. Hence arose a split, and the American surgeons dissolved their relations with the American Committee, and formed a union with Dr. MacCormac, Dr. Frank, Dr. Webb, and other English friends, under the title of the Anglo-American Ambulance. We then went to the French Société de Secours aux Blessés, in the Champs Elysées, where our services were at once accepted. The English surgeons had £2,000 sterling, and a lot of stores. The French gave us 15,000 francs, horses, waggons, tents, and, indeed, everything we asked for. Both parties promised us all the money and all the stores we might need for the future. The French gave us 7,000 francs more at Sedan, and they have furnished us with rations ever since we entered the service, and will continue to give us money and rations. You know how generous and opportune has been the assistance from your side.

"Our organization was completely French, but composed only of English and Americans. We studiously, and I can now say wisely, excluded all other nationalities. We were half-and-half, eight Englishmen and eight Americans.

"The English are—

Dr. William MacCormac,
Dr. Frank,
Dr. Webb,
Dr. Blewitt,
Dr. Wyman,
Mr. Hewitt,
Mr. Scott,
Mr. Ryan.

"The Americans are—

Dr. Marion Sims,
Dr. Pratt,
Dr. May,
Dr. Tilghman,
Dr. Nicoll,
Mr. Hayden,
Mr. Wallis,
Mr. Harry Sims.

"I was made Surgeon-in-Chief, and Dr. MacCormac was placed next in command. Dr. Webb was *comptable*, which includes the functions of Commissary and Paymaster. Thus organized, we left Paris on Sunday night, the 28th August, with orders to report at Mézières. We arrived

there on Monday night, and on Tuesday, the 30th, we came to Sedan, where we found the Caserne d'Asfeld already converted into a hospital, which the authorities gladly turned over to our use, and we took possession of it on the 31st. We had hardly entered its grounds when the roar of cannon announced the battle of that date. At night, most of us repaired to the battle-field. Many of the wounded were transported to our hospital at Sedan, but many more, too severely wounded to be transported, were housed in the village of Balan. Several urgent operations were performed that night by MacCormac and Frank.

"Besides those sent to the hospital at Sedan, and those attended by MacCormac and Frank, our staff visited and ministered to the wants of more than a hundred others. Drs. Frank and Blewitt remained all night at Balan, the others returning at midnight to Sedan. Early next morning, the 1st Sept., began the great battle of Sedan. Dr. Frank's hospital was in the midst of it at Balan, and he was busy all day receiving and dressing the wounded that fell in sight of his door. The house that he occupied, the Mairie, bears the marks of many bullets, and he was at one time, for self-preservation, compelled to lie down by the side of his wounded and dying. Dr. Frank being thus accidentally, or I should rather say providentially separated from us, established a

branch of the Anglo-American Ambulance at Balan, while we remained at Sedan. On the night of the 31st August, we received at Sedan thirty-six wounded, and on the 1st and 2nd Sept. every bed was occupied. During the whole day of the 1st Sept., the seriously wounded were brought on *brancards* or stretchers to the hospital in a continuous stream. Dr. Webb, Dr. Wyman, Mr. Ryan, Mr. Hayden, Mr. Wallis, and Harry Sims were busily occupied at the door dressing the slightly wounded and such as could walk. Dr. May, Mr. Hewitt, and Mr. Scott were sent to the Mairie, bursting bombs falling on all sides, to attend the wounded there, and in the adjacent houses. Dr. MacCormac, Dr. Pratt, Dr. Tilghman, and Dr. Nicoll, others assisting as they could, devoted themselves to the operating-room. They stood nearly all day and a good part of the night at the operating-table, and MacCormac performed a great number and variety of operations."

After some valuable remarks on the importance of small ambulances in contrast to the cumbrous organization of those of the French Society, Dr. Sims concludes his report as follows :—

"Now, sir," Dr. Sims continues, "in taking leave, allow me to thank you for the promptitude and liberality with which you have supplied all our wants, and to tell you that I have only

words of praise for every member, male and female, of the Anglo-American Ambulance. To Dr. MacCormac, as Co-surgeon in chief with me at the Caserne d'Asfeld; to Dr. Frank, as chief at Balan; to Dr. Webb, as *comptable* for both establishments; to Father Bayonne, the Catholic priest; and to the Rev. Mr. Monod, the Protestant minister, I am under the greatest obligations. And to each and every member of the Anglo-American Ambulance, I beg leave to tender my most grateful acknowledgments. We have worked together cheerfully, heroically, each vying with the other in doing his duty.

"The English and Americans affiliate naturally. Of the same origin, with the same language, having a common literature, the same laws and religion, even the same liberty under Government, how could it well be otherwise? In truth, the English and Americans are full of genuine human nature. When a common cause unites them they are as a band of brothers. But when political views differ and selfish interests clash, they hate as only brothers do under opposing circumstances. If the two peoples could always be as kindly united in sentiment and action as are their representatives in the Anglo-American Ambulance, there would be no more *Alabama* claims to settle.

"Believe me, Sir, yours, &c.,

"J. Marion Sims,

"*Surgeon-in-Chief of the Anglo-American Ambulance.*"

I should wish, however, to add a name or two to those thus mentioned by Dr. Sims. To Dr. Duplessy I would here acknowledge my thanks and appreciation of his high-minded conduct on all occasions, and our best thanks for the gratitude he was pleased to evince for, and the estimation in which he was good enough to hold our services. To M. Billotte, our French *Officier d'Administration*, I would here also wish to record the very high credit that is due for the prompt and efficient aid he rendered to us in so many ways, and the great value we set upon his cordial co-operation.

Everything in war time is *à l'imprévu*, for one can never tell beforehand what is about to befall. So it was even with us from our first start from Paris on the 28th of August last. Through a number of accidental circumstances, foreseen by none of us, we joined together, a band of English and American surgeons, anxious to give our aid to the sick and wounded as accruing from this bloody war. We were sixteen in all, eight Americans and eight English, with Dr. Sims and myself at the head.

We received our stores, as already mentioned, at the Palais de l'Industrie, in the Champs Elysées, then a vast receptacle for medical supplies of all kinds, and, with two waggon-loads of medical comforts, surgical instruments and

appliances, some saddle-horses, and a troop of *infirmiers*, or male nurses, we formed a procession along the Boulevards, on Sunday, August 28th. In due time we reached the railway station, and started for the purpose of reaching MacMahon's head-quarters, and the field of battle wherever it then might be.

I may here say a word as to the organization of the French voluntary ambulance corps. The generality of them were monstrously cumbrous. There were too many surgeons, too much material to transport, and too many *infirmiers*. Too often these were taken from a class of men who enlisted in this service to escape being called upon to fight in the army. In some of the ambulances there were as many as forty medical men, and a dozen heavy waggons, with horses in corresponding numbers. Some of these ambulances spent most of their time in marching and countermarching, never reaching, in time to be of use, the actual scene of operations. Their waggons would often stick fast in some country by-road, or in a field, and then they would have to be abandoned. There were ten such ambulances. As a system or organization, the French Society for Aid to the Wounded has to a certain extent failed in its mission. No doubt it has done much good, but not proportionate to its resources, which have long since been completely used up. In my opinion,

a field ambulance should be constituted of not more than four or five surgeons, and as many assistant-surgeons, who would act as competent dressers, and who had been trained to dress severe wounds. Skill as a dresser is almost as much required on the battle-field as skill as an operative surgeon, and there is ample scope for the employment of carefully educated young surgeons in this capacity. I look upon this point as of the first importance. All the cases, whether they be operated upon or not, require careful dressing, and too often this has to be entrusted to inexperienced hands. For a moving ambulance, the smaller the quantity of stores taken the better, and these without exception should be carried on horses or mules. The waggons are a serious impediment, and very often, as I have said before, must be abandoned, with their valuable contents, altogether. What is most needed are a few cases of surgical instruments and appliances, some medicines, chloroform and carbolic acid, one moderate-sized tent, and half a dozen stretchers of the simplest construction, to carry the wounded and to serve as beds. These, and some tins of preserved food and biscuits, are all that need be carried about. For whatever else may be required, one must trust to the supplies of the place in which one may happen to be. If the French ambulances had been constructed

upon this system, and multiplied in number, they would have been much less costly, and, I venture to add, would have done much more good. Of course these remarks apply only to field ambulances which follow closely, or are supposed to do so, the movements of the troops. For more extensive organizations which go to a certain spot, and there establish a complete hospital, the case is different. But the great difficulty for these is to secure patients. In moving troops about, and taking up a position from which to offer battle to the enemy, I fear that as yet generals are not much actuated in coming to a decision, by any consideration, as to where may happen to be placed the largest and best hospitals, or indeed any hospitals at all. No doubt if the scene of battle could be foretold, it would be quite right to send thither beforehand the amplest medical provision possible. But as that can never be, the less complete but more manageable organization of an *ambulance volante* must be relied upon to furnish that immediate succour so much needed on, or close to, the battle-field itself.

In accordance with our instructions on leaving Paris, we tried, after arriving at Sedan, to reach MacMahon's head-quarters and the front. The Vicomte de Chezelles, Courier des Ambulances, acted as our guide. We heard that hard fighting

had been going on all that day at Carignan, and we were told of a French success, and that the field was won. We designed to reach the nearest battle-ground and set at once to work. Through a combination of circumstances we were delayed that evening, the 30th August, at the railway station near Sedan, and we saw the Emperor, MacMahon, and the whole État Major, arriving during the night. It was a striking sight to witness the flying Emperor surrounded by his marshals and generals, arriving in such a manner. They walked silently a couple of hundred yards from the railway station to the walls. In a moment or two the drawbridge was let down, and the whole party disappeared inside. The drawbridge was as rapidly raised, and the night became silent as before. And this was the result of the reported French victory, of which we had been hearing all day.

In place, therefore, of our going to the front, the front came to us. Then were the negotiations completed with Dr. Duplessy, Médecin en Chef des Hôpitaux Militaires de Sedan, which placed us in possession of a large hospital of 384 beds on the battle-field of Sedan. This piece of exceptional good fortune, namely, getting into a first-rate position, and into working order, just on the eve of a great battle, enabled the Anglo-American ambulance to render services such as

no other ambulance in either army has, I believe, been in a position to perform during this war.

Of course, during the first ten days or a fortnight we were shorthanded, and overworked. Such a result appears inevitable after all great battles. I find, from the diary which I kept, that we have sometimes been working for twenty hours at a time, performing operations, noting cases, and making dressings. I have heard of surgeons working for much longer spells after battles. But it is questionable if work done under like circumstances can be of advantage to the wounded. Not only does one suffer from physical fatigue, but one must lose, more or less, that clear intelligence which the urgency and severity of the cases necessarily demand. Some conception of the amount of work required at the hands of the surgeons after the Battle of Sedan, may be gleaned from the fact, that there were of French wounded alone, exclusive of the dead, 12,500. What the German losses may have been I do not know, but they also were large. The building of which we got possession was an infantry barrack, situated on the ramparts of Sedan, at the place to which the Prussians afterwards gave the appropriate enough name of Kronwerk Asfeld.

The Caserne d'Asfeld, of which a good view is given in the frontispiece, was so named after a French marshal who belonged to the town, famous

also, before it gained its present notoriety, as the birth-place of Turenne. The barrack is on a plateau in the fortifications, about 70 feet above the level of the Meuse, which meanders through the valley. It is a two-story building, about 240 ft. long, and contains nine large rooms and four smaller ones on each floor. The large wards are 17 ft. 3 in. broad, 53 ft. 6 in. long, and 10 ft. 5 in. high. If an average of twenty beds be allowed for each ward, it would give for each patient a cubic space of 450 feet, but at first there were twenty-four occupied beds in each ward.

When we reflect that in a civil hospital, with cases much less serious, four times that amount of cubic space per bed is considered not too much, it is no wonder that we dreaded an outbreak of pyæmia, hospital gangrene, or erysipelas. The wards, which ran pretty nearly north and south, had large windows at each end, and the intercommunicating doors were at the middle of each side.

The smaller rooms were used as sleeping apartments for the members of the Staff. One or two of them were used as separation wards for particular cases, for stores, and for an apothecary's shop. We had the advantage of the services of a very intelligent French *Pharmacien* whom we procured from the town.

All that could be done to obviate the effects of overcrowding was done. The windows, fine weather or foul, we constantly kept wide open, the asphalte floors were washed twice daily with a solution of carbolic acid, and all once-used bandages and dressings were burned.

CHAPTER III.

On the afternoon, then, of the 31st of August, we were installed in medical charge of the Caserne d'Asfeld, and awaiting the arrival of the wounded. Nor had we long to pause. The fact of there being an English ambulance in occupation of the barrack must have been speedily made known, as wounded men almost immediately began to arrive. Severe fighting had been going on all day in the direction of Pont Maugis and Bazeilles, about three miles distant, which we were able to see very distinctly from our elevated position. We had scarcely, indeed, unpacked our waggons and brought our stores inside, when bearers arrived with stretchers, carrying a number of severely injured soldiers. Others came on foot as best they could, having in many instances marched long distances with wounds in different parts of the body.

Dr. Webb, with two or three assistants, re-

mained in charge of the door, examining the wounds of those who arrived, a large proportion of which had received attention on the field, and were enveloped in temporary dressings. All who were lightly wounded had their wounds re-dressed, and were then at once sent away, a biscuit or two being given to each of them. Those who appeared to demand further care were passed into the house. Dr. Webb's was no easy task, for everyone who applied was desirous of admission, often in the inverse ratio of the gravity of his injury. However, the Doctor was most firm and judicious, and exercised in every instance a wise discretion. About 130 poor fellows passed through our hands that afternoon.

At six o'clock, when we were getting our affairs into somewhat better order, a gentleman rode up in hot haste to inform us that at the village of Balan, near which there had been fighting all day, there were upwards of two hundred wounded, with no one to look after them. He told us the place was about two kilometres, or a little over a mile, distant. Dr. Sims had our ambulance-cart got ready, into which we put surgical instruments, dressings of all kinds, chloroform, carbolic acid, and some provisions, such as Liebig's extract of meat, and biscuits, and he, Dr. Frank, and myself, with

Messrs. Blewitt, Wyman, and Hewitt, started for Balan. Just at the entrance to the village we found a number of wounded in the various houses, and also two carts, each containing three or four wounded soldiers, standing in the roadway. I stopped there with a portion of our supplies, and, with the aid of Mr. Hewitt, set about attending to the poor fellows as well as we could. Dr. Wyman, who also stayed with us for a time, was shortly taken away to see another set of wounded, and did not return again to me that night. The rest went on, and spent several hours upon the battle-field, giving all the succour they could to some hundred poor soldiers lying there untended.

I found about thirty cases to look after. In the first place, I took possession of an exceedingly nice empty house, and, with the aid of the neighbouring people of the village, arranged some beds upon the floor, and extemporised an operating-table in one of the rooms. All this took some time, and it was now quite dark. The first poor fellow whom I examined had his left tibia smashed by a bullet. It was too plainly a case for amputation. He was a soldier of the marines. Mr. Hewitt administered chloroform, and then compressed the artery for me. One indigenous volunteer held a candle, whilst another provided a basin and sponge, and, under these

difficult circumstances, I removed the leg in the upper third. The next was an artilleryman, whose left leg was very extensively shattered by a shell explosion. Both the bone and the soft parts were much injured. There was great muscular development of the calf. I amputated this leg just as I did the other, by oval skin-flaps and circular division of the muscles. For some days these men received very little attention, but both recovered admirably under the care more particularly of Mr. Blewitt, who stayed with Dr. Frank at Balan that night, and subsequently remained there permanently as one of our Balan division. I often saw these two patients when I rode out to visit Frank. They got on without a single drawback, and both recovered perfectly.

There were several other important cases; for instance, that of a soldier of the marines, who was shot through the middle of the left deltoid muscle, the ball passing directly into the chest through the head of the humerus. There was no wound of exit, and the probe passed in an indefinite distance. The symptoms present were short cough, difficult respiration, and bloody expectoration. It was clearly a case of penetrating wound of the chest with lodged bullet. The man subsequently died.

SCHYLTER, another marine, was lying insensible with extensive fracture of the skull from a shell.

The brain was a good deal lacerated and exposed. For neither of the poor fellows could anything be done.

In another artilleryman, an immense fragment of shell penetrating the calf had become wedged between the tibia and fibula. It was very difficult to remove. These and other cases having been attended to, we prepared to return to Sedan, as it was very late, and we were all tired. Amongst us, we must have attended to two hundred and sixty wounded men that afternoon and night. We all slept the sleep of fatigue, but our quarters were none of the most comfortable. We took possession for ourselves of two rooms on the first floor, each containing eight beds. These were the same as those in the wards, very narrow, covered with the soldiers' bedding, and filled with bugs, which disturbed our slumbers fearfully. There were no washing utensils, or other conveniences of any kind. Such a thing as a chair was not to be found in the whole establishment.

In spite of our fatigues, we were awakened very early the next morning, September 1st, by the sound of heavy cannonading. Towards five o'clock, when it became light, we perceived that everything was enveloped in a dense fog. The troops could not have seen each other, yet the firing commenced between three and four in the

morning. It went on *crescendo*, and after the fog lifted, spread all along the lines, which were some four miles in extent. At each end, Floing and Donchery on the north-west, and Bazeilles and Balan on the south-east, the infantry and cavalry came into collision,—while on the rising ground in front of us, about a mile and a half distant, we had a fine view of the Prussian batteries of artillery, which, from ten o'clock in the morning until four in the afternoon, literally rained shells upon the French positions just in the rear of the hospital. The French, of course, replied, and there was in consequence a storm of projectiles flying close over our heads in both directions all this time. The heavy guns of the citadel just alongside of us were also firing; and all these, together with the incessant *hurr-r-r* of the mitrailleuse and the musketry fusillade, made us feel as if our quarters were exceedingly hot. Several times the Prussian shells struck the building, and some of them burst in the enclosure, killing and wounding several persons—amongst the rest, two of our male nurses or *infirmiers*, and a number of soldiers. About four in the afternoon, the German fire was turned in another direction, and the feeling of relief which we all experienced was as agreeable as it was great. By six o'clock, the cannonading and fighting had stopped altogether.

During the entire day the wounded were arriving, some hobbling along on foot, others carried upon stretchers. Our guards at the door had no easy task, for, besides the wounded, numbers of demoralized soldiers demanded admission, seeking shelter and protection. In the barrack square not less than 4,000 men of all arms had accumulated, and, as night came on, they lay stretched side by side upon the ground, their arms piled beside them, and so closely as to render it almost impossible even to pick one's way amongst them without trampling on somebody. The camp fires flickering here and there added to the strangeness of the scene.

During all that day I was busy examining the wounded carried into the hospital, and performing operations on those who needed them. These last were done at one of the ward windows in order to get a good light, and we were unable wholly to divest ourselves of the unpleasant conviction that at any moment a shell might burst in our midst, dealing destruction to all around. I suppose one might perhaps become accustomed to it in time, but, at first, operating in the direct line of fire, as we were, with the shells continually whizzing in our ears, and hitting the building from time to time, has a somewhat disquieting influence. One of our party while on duty at the door saw a shell explode a few

paces off, killing and wounding several of the soldiers.

I did not succeed in keeping a record of all the work that was done that day. Indeed, I only wonder I kept any record at all. I find, however, that I performed several amputations of the leg, the thigh, the forearm, and the arm, that I excised the shoulder and the elbow joints, and also performed partial resections of the upper and lower maxillæ, and of nearly the whole ulna. The number of bullets and pieces of shell that were extracted from various parts of the body are too numerous to reckon. Thus came to an end, late on in the night, our second day's work.

As closely as I have been able to calculate, we received, during the course of that day, 274 patients into the hospital, and dressed and otherwise attended to, at the door, 250 more, at the very lowest calculation. It was very hard to turn many of these wretched, hungry men away, but we could not help it. We should otherwise have been overrun. Towards the end of the day our discipline, to a certain extent, relaxed, and we allowed a number to get a night's rest and food, which they took lying about on the staircases and in the passages of the hospital, which were thus everywhere crowded.

We were all by this time pretty well exhausted, and, although there were many whose

cases demanded interference, we felt it necessary to take some hours' rest. All within the house had been attended to more or less, temporary dressings had been applied to the wounds, opiates were administered to all those suffering pain, and some food was given to the hungry. Nearly all the men were tired out with fatigue and suffering. Outside, all was quiet. The soldiers in the barrack square lay stretched in profound sleep by their expiring camp-fires. But looking over the town and country we saw the flames of houses burning in several places, and a loud continuous hum of thousands of voices rose in the night air from the caged soldiers in the town. In particular, I noticed the masses of flame and smoke which rose from burning Bazeilles. We went to bed all uncertain as to what might happen on the morrow, and wondering if the bombardment would recommence. Rumours of the most varying kinds reached us, but the prevailing opinion was that all had been lost, that regiments had given themselves up *en masse*, that even generals had fled. A Colonel who had been at Weissenburg, Wörth, and Forbach, whose eagles had been decorated, told how, when he could fight no longer, he had burnt his colours, and buried the eagles along with his decorations, that they might not fall into the enemy's hands. He and other officers declared, with tears in their eyes, that

their country had been dishonoured, betrayed, and lost by incompetence of the grossest kind.

Next morning, the 2nd of September, the sun shone out bright and beautiful over the wreck and ruin of the previous day. We rose early. From the ramparts, we saw the dead soldiers strewn all about. A little further off we saw Prussian burying parties busily engaged interring the killed, an office which was not wholly completed for nearly a week. Our own dead during the first few days, and they were not a few, were interred in a trench some little distance from the hospital. After the affairs of the town became again somewhat *en règle*, the civil authorities took charge of the burials, and relieved us from further trouble.

We commenced as soon as possible to attend to those cases which had not been thoroughly examined the day before. I may here repeat what has been insisted upon elsewhere, and by none better or more forcibly than Professor Longmore, that it is of the very last importance to make a complete examination of gunshot wounds during the primary stage, that is, as soon as possible after the receipt of injury, and before inflammation sets in, and that no probes and no apparatus will adequately subserve the use of the finger. If necessary, too, the wound may be somewhat enlarged. It is but of small con-

sequence to do so in comparison with leaving the extent of comminution in an injured bone undiscovered, or a lodged bullet unextracted. It is more difficult than might be supposed to estimate the gravity of a gunshot injury, or to ascertain, by means of a probe, the existence of a bullet in a wound, more especially if it be a wound of bone, as, for instance, a bullet lodged in the spine. The extraction of bullets also requires both skill and patience. Much injury may be inflicted on surrounding parts by the incautious use of the bullet-forceps.

The mortality consequent upon primary amputations is so very much smaller than that attendant upon those called secondary, that this point cannot be too strongly insisted upon. Quite a large number of poor fellows were sent to us from other ambulances, ten days or more after the battle, whose limbs should have been removed in the first field-hospital they reached. We were obliged to amputate them, but the mortality was distressingly great. Again, it may not perhaps be sometimes of vital importance to remove a lodged bullet, but were it only for the mental solace afforded to a soldier by the extraction of the ball, it would prove a sufficient reason to do so if possible. A soldier seems generally to imagine that his life almost depends on the extraction of the missile that has

injured him, and his joy is proportionately great when it has been successfully removed, while he never appears comfortable, either in mind or body, so long as it remains in the wound. Of course the great difficulty consists in there being neither hands nor time sufficient after a great battle to make these examinations so fully and so completely as the occasion demands. The bullet-forceps I preferred was one with claw points, at a right angle with the handle, and slightly overlapping, so as to admit of easy ingress. When these catch the bullet, they rarely let it slip. All that is required is to ascertain beforehand the exact position of the foreign body, and then to pass the forceps gently down to it. I must confess, in spite of high authority to the contrary, I did not like Coxeter's ingenious bullet extractor. I think there are some objections to, and few advantages in, its use.

Meanwhile, the day wore on, and the fighting did not recommence. The batteries on the hill-slopes opposite did not reopen their deadly fire. We saw heavy columns of Prussian infantry posted inactive in the fields. First came to us the report of an armistice of forty-eight hours, to bury the dead, then the stupendous news that an army of 100,000 men, 400 pieces of artillery, 70 mitrailleuses, and an Emperor to boot, had

capitulated without being able to strike another blow for their country or their liberty.

Once in Sedan, there was no way out of it. The French army had become transformed into a disorganized mob. The officers knew not where their men were, the soldiers knew nothing of their regiments or their officers. Men of all arms were mixed up together in irremediable confusion. Some were cooking horseflesh, some were eating it even raw. Many were lying about the streets in the deep sleep of fatigue. Everything and everybody looked utterly wretched and miserable. At each corner were the bloody skeletons and entrails of horses, from off which every scrap of flesh had been cut, but bread was not to be had for love or money. In the hospital *enceinte* the same thing was going on. Four thousand men had been collected there, and the *débris* they left behind required the hard work of relays of men, during several days, to remove. All the 2nd of September, like the 1st, we were engaged performing amputations, excisions, and in removing deeply lodged balls and pieces of shell, only interrupted, from time to time, by calls to see some fresh arrival.

In the evening, after a hard day's work, we got a summons to say that in the town were large numbers of wounded still untended. A party of us went down. In every second house,

almost, there were wounded men. The theatre was full of them, the church was full of them, other public buildings were equally full. Some we had transported to our own hospital, while to others we administered what comfort we could. Subsequently, aid arrived from other ambulances, and from the military medical officers, but for the first few days the *encombrement des malades*, as the French call it, was almost enough to make one give up in despair.

That evening, to my great relief, I heard from Dr. Frank, and that he was safe. When I saw the village in which he was in flames, and knew that it had been the scene of a desperate fight, I feared we might never again see him alive. Indeed, at one time, and with only too much reason, he had given himself up for lost. All by himself, he tied the carotid artery for a wound of the face, and performed other operations, but he had not had sufficient help. There were two cases, he afterwards told me, where amputation should have been performed at the hip-joint, but this had to be left undone for want of assistance.

CHAPTER IV.

THERE were many cases which came under our care on that day, September 2nd, of deep interest. Amongst the rest were two in which I was afterwards compelled to tie the common carotid for secondary hæmorrhage.

CASE I. was that of a French Colonel, who had been wounded near Balan on September 1st. The ball had entered the right cheek, passed downwards through the horizontal ramus of the inferior maxilla, comminuting it extensively, and then lodged deeply beneath the right sterno-mastoid muscle, where it was with great difficulty detected. On the day following I removed it through a very deep incision along the posterior edge of the muscle, at a point level with the angle of the jaw. The ball was much altered in shape, and a piece of the bone was firmly impacted in it. We thought the Colonel was quite convalescent, he was walking about, his wounds were healing fast, when, on September 10th, he had a severe attack of hæmorrhage both from the mouth and from the wound made for the extraction of the ball. This was checked. He had a second attack, which was also arrested, then, all on the same day, a third, and more profuse than the others, took place. At midnight, I cut down upon and tied the common carotid. No return of the bleeding took place. The ligature fell in

fourteen days. I brought the colonel away with me when I left Sedan, and he is now staying in Brussels, his wounds all but healed. His father, also a colonel, was shot almost in the same manner at Waterloo, and recovered, like his son.

Case II.—My other case, similar in many respects to that just narrated, was not so fortunate in its issue. Jacob Nieder, a Prussian, aged 22, was wounded on September 1st. The ball entered just beneath, and slightly external to, the left ala of the nose. It then ripped up the whole of the hard and soft palates in the central line, with the exception of the alveolar ridge. Three days afterwards, the bullet was extracted through a deep incision opposite the middle of the posterior border of the right sterno-mastoid. This patient made good progress until the afternoon of September 11th. He was, like the Colonel, apparently convalescent, and able to walk about. On that day very profuse bleeding took place. The blood poured down through the wound in the roof of the mouth so fast as almost to choke him, and free bleeding also occurred from the incision behind the sterno-mastoid. The difficulty was to ascertain whence the hæmorrhage came. Pressure exerted alternately on each carotid failed to afford the clue, as no decided effect was thus produced. There was no time to hesitate, the man was rapidly bleeding to death. I decided that, although the mouth-wound was mesial, the bullet had, in traversing the right side of the neck, probably injured some branch of the right external carotid. I tied the right common carotid, and, to my great relief, the bleeding was permanently arrested. Otherwise one might have had the undesired opportunity of witnessing the effects of simultaneous ligation of both carotids, for I would have tied the opposite external carotid, had the first ligature failed to stop the bleeding. Nieder, for five days, progressed favourably, acute double pneumonia then set in, and he died.

The Chassepôt bullet which caused the injury is represented in the accompanying wood-cut. It

has been greatly altered in shape during its passage through the bone.

FIG. 1.

CASE III.—A third case, very similar to these two, except that there was no secondary hæmorrhage, was that of an infantry soldier named CHARLEROI, aged 27. He was wounded on September 1st. The ball entered one inch and a half external to the left commissure of the lips, and emerged behind the middle of the right sterno-mastoid muscle. The lower jaw was fractured at its angle on the left side. This man died exhausted eight days afterwards.

CASES IV. and V.—We had two singular cases, in each of which a piece of shell traversed horizontally across the face, passing beneath the bridge of the nose, but leaving the bridge complete, and the nose but little altered in form. In each case one eye was destroyed, and the lids of the other grazed. Both patients were in a short time discharged convalescent. There were three other cases in which one eye was destroyed, and a remarkable example of temporary loss of vision from a shell-explosion close by, which caused no further injury.

There were several other cases of wound of the neck and face admitted on the 1st and 2nd of September, of some of which I may furnish a few details.

CASE VI.—I only recollect one example of extensive injury to the upper maxilla. A man came in during the heat of the fighting on September 1st, with his left cheek partially torn

away by a shell. The bone was a good deal comminuted, and the antrum of Highmore laid open. The soft parts were lacerated and contused throughout a length of four inches, and the greater portion of the masseter muscle was torn off. I removed all loose pieces of bone and shreds of flesh, sutured the wound, and applied carbolic dressings. I never saw this man again, nor heard of him. I believe he left the hospital after getting his wounds dressed.

Case VII.—About the same time of the day Captain Bera came to us with a large portion of the body of the lower maxilla carried away by a shell. Fortunately, the alveolar ridge was intact. I removed all loose portions of bone, and adjusted the soft parts. He recovered with scarcely any deformity. He was a very handsome young man, and was chiefly anxious that his good looks should be preserved to him.

Case VIII.—An infantry soldier, named Mathie, was shot through the face the same day. The ball entered just beneath the zygoma, rather less than an inch in front of the left ear. It then crossed the nasal fossæ, and emerged through the right cheek, fracturing the right malar bone. This man did not appear to be even inconvenienced by his wound, and soon left the hospital quite convalescent.

Case IX. is very like the preceding. Bulion, 1st Zouaves, was also shot across the face. The ball entered under the left malar bone, immediately in front of the edge of the masseter muscle. It ripped up the hard palate on the left side, and then, being diverted upwards, emerged beneath the right zygomatic arch, three-quarters of an inch in front of the ear. After a fortnight's treatment, this man left the hospital convalescent.

Case X.—Navel, 4th Regiment of Marines, was wounded by a ball, which entered beneath the centre of the left zygomatic arch, and made its exit exactly at the tip of the right ear. The last molars of the upper jaw on the right side, half of the soft palate, and the uvula, were torn away. This man also recovered.

Case XI.—Private Fays received a ball on September 1st, which entered the left cheek close in front of the masseter muscle, and emerged just over the vertebra prominens. The front of the chest was ecchymosed. There were no symptoms of serious injury, and in three weeks he was discharged convalescent. The wound, however, remained fistulous.

Case XII.—Galliard, *Chasseur à Pied*, was struck on the 1st of September by a ball, which entered beneath the left eye, and after smashing the left malar and palate bones, emerged below the right ear, to re-enter the anterior border of the trapezius, then passing downward and backward, it made its final exit over the inferior costa of the scapula. This man quite recovered in a short time.

Case XIII.—Antoine, 53rd Regiment of the Line, was also wounded on the 1st, *en battant la retraite*. The ball entered just to the left of the sixth cervical vertebra, and emerged through the right cheek, in front of the insertion of the masseter muscle in the lower jaw. The wound of entrance, with its bruised and inverted edges, was much larger than the wound of exit, whose edges were as if cut and everted. For a fortnight, Antoine did well. He then took typhoid fever, and died.

Case XIV.—This is a case almost identical, except in result, with the last. Fritz, a soldier of the 89th Regiment of the Line, was also wounded *en battant la retraite*. The ball entered a little below and to the left side of the vertebra prominens, and emerged through the middle of the left sterno-mastoid muscle. The wound of entrance was much larger than the wound of exit. He recovered without any symptom of importance.

Case XV.—Bernard, 5th Regiment of the Line, was struck by a ball, which entered one inch externally to the left commissure of the lips, fractured the left ramus of the lower jaw, and emerged through the central point of the fold where the chin joins the neck. The same ball, passing downwards, again

entered just below and outside the right sterno-clavicular articulation, and, after fracturing a couple of ribs, was cut out on a level with the nipple, but four inches external to it. For a time, this patient did well, but he ultimately died of pleuro-pneumonia excited by the fractured ribs.

Case XVI.—Renan, wounded, like most of the others, on September 1st, was a soldier of the Marines. The ball entered just below the left ala of the nose, passed through the upper lip, knocked away the two left incisors, also the canine and first bicuspid teeth, grooved deeply the dorsum of the tongue, left the cavity of the mouth by piercing the right posterior pillar of the fauces, and finally emerged behind the right sterno-mastoid muscle. This man was discharged convalescent in a fortnight, having only suffered the very smallest possible amount of inconvenience.

These cases are chiefly remarkable on account of forming a series very similar to each other in most important particulars, and in none more than the marked smallness of the mortality, or the absence, indeed, of any serious consequences whatever. The great majority convalesced rapidly. The same fact has been observed in other wars with regard to wounds of the face and neck, which appear, as a rule, to be readily recovered from.

We had, besides, a large number of gunshot wounds traversing the neck in various directions, also without injuring important parts. In one case only was the trachea wounded.

Case XVII.—Farjonel was struck by a ball which entered in front of the left sterno-mastoid muscle, and emerged just above the centre of the right clavicle, wounding the trachea in

its passage across the neck. During respiration, the air flowed freely out of each aperture. He made, nevertheless, a good recovery.

There must occur many instances of combatants with wounds of the great vessels of the neck, who die immediately, and are never carried off the field at all, but the surgeon has his hands too much occupied with the living wounded to have much time to examine the injuries received by the dead.

Coming down a little lower in the body, there were under our care five cases in which the clavicle was smashed by a ball, which afterwards wounded the lung. In two of these I found it necessary to excise at least one-third of the clavicle. In a third, the ball was cut out from the back, having traversed the lung with a piece of the clavicle sticking in it. Four of these patients died. The fifth recovered. In this last, the ball, besides fracturing the clavicle, had passed out through the infra-spinous fossa of the scapula, starring it. In all of them there was profuse hæmoptysis.

The longest day must come sometime to an end, and so did the 2nd of September. It was only in the evening that we learnt authoritatively what our position really was. General De Wimpffen, who had succeeded in command of the army, when MacMahon was shot

through the hip, posted a proclamation in Sedan, in which he announced that he felt constrained to capitulate in order to avoid a useless massacre, that the whole army could have been destroyed, without being even able to reply to the enemy's fire, and that, further, when on the evening before he had appealed to the courage and devotion of his troops to make a sortie and cut their way out through the German lines, only two thousand men could be found willing to rally round his standard.

September 3rd.—It has been raining heavily all night, and the unfortunate soldiers must have found it difficult to keep their fires alight. They could not have slept much, as nearly all night through we heard the confused noises which masses of men so crowded together are sure to make. In the morning they presented a sad and sorry plight. Outside the town we saw the German troops being paraded, and could hear distinctly the huzzas and cheering with which they received the news of their wonderful success when the king passed them in review. About nine in the morning, to the strains of splendid music, the Prussians marched into Sedan, occupying as their head-quarters the Sous-Préfecture, which the unfortunate Emperor and his staff had only left a few hours before. I was particularly struck

by the fine appearance of both men and officers, and especially of their horses. They looked more as if they had just left the parade-ground in Berlin than like troops who had been for two months campaigning in the heart of an enemy's country. During the day a somewhat exciting little episode took place. A patrol of soldiers came up to take possession of the barrack. Chezelles and I went to the gate to meet them, on which they levelled arms at us. We explained that we had no soldiers amongst us, but only wounded men, both French and German, in the barrack. Immediately after receiving our explanations they retired, expressing themselves as perfectly satisfied, and from that time forward we were in no wise interfered with by either the Prussian medical or military authorities, except in one particular, which is a matter requiring some explanation, which I shall now endeavour to make.

For the first fortnight we had for the nursing of our patients to depend exclusively upon the service of military *infirmiers*, or male nurses. Several of these men were most excellent fellows. Some were quite invaluable, having received a thorough training in nursing the sick and in dressing wounds at the great French Military Medical School of Val-de-Grâce. Others, again, were as bad as the first were good.

There is a regular service of *infirmiers* in the army, and these men are held to be inviolable, just as the sick themselves, or the surgeons are, according to the terms of the Geneva Convention, to which both French and Germans had agreed. Under such circumstances we were naturally made very indignant when, on two occasions, a large number of our *infirmiers* were marched off and sent prisoners to Prussia. The first abstraction took place on September 10th. We then got fresh supplies, with the assurance that these should be left to us. And yet, on September 15th, a large proportion of these also were removed, after we had both times had all the trouble of training them, as well as they could be trained, to their work. The annoyance, and inconvenience, and loss in every way, both to ourselves and to our patients, can, perhaps, be imagined, but scarcely described. Besides, it seemed to be so direct a violation of the Geneva Convention. What, however, I did not discover till afterwards was, that only those men not regularly inscribed as *infirmiers* were removed. The staff of *infirmiers*, properly so-called, was never interfered with. This statement I make on the authority of the French *Officier d'Administration*, M. Billotte, with whom we were associated, and whose valuable assistance on all occasions I wish to acknowledge in the

strongest manner. The Prussian authorities were distinctly *dans leurs droit* in seizing upon those *quasi-infirmiers.* But their action did not on that account embarrass us the less, and when the vast number of wounded French soldiers accruing from the battles around Sedan is considered, one cannot help wishing that the Prussian Commandant might have been a little less *exigeant.*

We received only twenty-two fresh cases this day, Sept. 3rd, and there were comparatively few out-patients to look after, but, if so, of work inside the Hospital there was no slackness. There were still several cases requiring operation, and many amputations were performed. It is unnecessary to go into many details about these at present, further than to say that in every instance chloroform was employed, that, during the operation, bleeding was controlled by digital pressure, the tourniquet being never used, and that the arteries were twisted, not tied, with the exception of the first few cases. Unlimited torsion was the method employed. The amputations were performed by long anterior and shorter posterior flaps, the first cut from without inwards, never formed by transfixion and embracing only the skin and its subcutaneous connections, or sometimes a thin layer of muscle, but the general mass of muscles was divided by a circular sweep of the knife. The short posterior

flap was usually formed by transfixion. Wire stitches were frequently employed to unite the edges of the flaps, leaving usually a portion unclosed to allow the easy escape of the discharges. The dressings were simple, consisting of a few strips of lint dipped in carbolic lotion, and a turn or two of bandage to keep them in their place.

The resections of the elbow and shoulder were done through a single straight incision, in the former case behind the joint, in the latter in front, unless when the scapula was injured, and then the incision was made behind. The knee-joint resection was performed through an oval incision in front.

CHAPTER V.

September 4th.—Not many fresh cases were admitted, and on this and the next few days we enjoyed a respite to a certain extent. Most of the fatally injured had by this time died, and we were able to discharge several, amongst whom were some malingerers, fellows with trivial wounds of the hand and foot, who had contrived to elude our vigilance at the door. In consequence of this, the wards were not quite so overcrowded. We found time to number the beds and wards, to assign them to different surgeons, to organise our nursing staff better, and to put our commissariat into good order. Some of our surgeons had forty-eight beds to look after, some had fifty-eight, and some so many as seventy-two. I devoted all the leisure time I could spare to taking short notes of the cases. These notes, of course, are very imperfect. It was very difficult to take them at all, on account of the little available time there was, and the difficulty

was frequently increased by the patients being moved from one part of the building to another. My notes, too, do not comprise the cases of some patients who died during the first two days, when it was all but impossible for any record to be taken, as everyone was fully occupied with other and more pressing work. Such as they are, however, the brief histories which I was able to take of our patients and of the nature of their injuries, are all that there is to form the basis of a surgical report of our work at Asfeld, and become, therefore, a valuable record.

We tried to-day, for the first time, to get some letters conveyed to Belgium, in order that our friends might hear of our safety, and we sent off two of our corps to the Belgian frontier in order to get to Bouillon, the nearest post-town, where they were to post our letters and procure as many eggs and fowls, as much butter and vegetables, and other food, as they could. One of the gentlemen spoke French and German, the other, neither. Not knowing the route, in place of going to Bouillon, they strayed into the road to Mézières, and soon fell in with Prussian patrols, who considered it very strange that, while purposing to go to Bouillon for supplies for an ambulance, they should be striking straight for Mézières, a fortress then in the hands of the French. In short, they were

looked upon as spies, and taken before the officer commanding. We only learnt on the return of the party, how very great a risk they had run, for it appeared that one of the letters they carried contained matter tending to implicate a person in Paris as a Prussian spy. Just when about to be searched, our messenger recollected this document. He was certainly endowed with much presence of mind, for, immediately feigning sickness and diarrhœa, he begged to see a surgeon, who administered a dose of laudanum. He got thirty drops, though he would not, he said, have hesitated to swallow a hundred, if necessary. He was then permitted to go aside, when he effectually disposed of what might have been the means of placing his life in very great danger. Our letters were afterwards given to an Englishman, an officer in the Prussian army, who promised to send them for us by an early opportunity, but up to the present time they have never reached their destination, and now, I suppose, they never will.

During the day I was able to take a walk for the first time. Standing on the ramparts just behind the hospital, we could see over the late French positions for two or three miles. Dead soldiers and dead horses were still lying in great numbers on the field, and we could see a few burying

parties at work. In the fosse at our feet and on the glacis the dead were lying in some places quite thick, and the heavy sickening odour that pervaded the air was very shocking and indescribably offensive. In the afternoon, Dr. Tilghmann and I rode over the battle-field. It was a sad, sad sight. For miles the ground was studded over with dead men and horses. Decomposition was fast setting in, which rendered the sight still more ghastly. In most instances the men were lying with arms and legs extended, generally on their backs, sometimes on their faces. Several soldiers had died preserving the last attitude they had assumed in life, with their arms raised, and as if holding the gun which they were about to fire. We passed the body of a poor officer who had died in a ditch after having had both legs amputated, and a dog watching by the grave of his dead master. Next day I sent a person to find the dog and bring him to me, but my messenger failed to execute his mission, perhaps he never tried. We passed along roads encumbered with guns and ammunition of all kinds, inspected houses burnt by shells, went through gardens once beautiful, now scenes of utter ruin, everywhere the same desolation, and no living thing anywhere. The stillness during our ride that bright sunny autumn afternoon was most oppressive, and the

beautiful sky overhead formed a contrast to the earth beneath, outraged by human passion and violence, that afforded food for reflection.

To-day I used the trephine in a case of depressed fracture with compression of the brain from effusion, of which I may give a few particulars.

Case XVIII.—This man had been struck at the apex of the occipital bone. He became violently delirious, the left pupil was contracted to the size of a pin's point, the right was normal in size. The left side was completely paralyzed, while the right arm and leg were in constant convulsive motion. After the depressed skull had been elevated, a quantity of grumous blood, mixed with portions of the brain, flowed away, and the patient became quite tranquil. But, as might be expected, the result was not satisfactory.

Of injuries of the head generally we have not had many examples.

Case XIX. is interesting, as being typical of the uncertainty both in diagnosis and prognosis often found in this class of injuries. Dupré, Captain of the 36th Regiment of Infantry, was struck by a ball which entered the crown of his kepi at one side, and, after making a *ricochet* off the vertex, came out at the other. There are the two holes in the cap in the flat oval disc which forms its upper surface, quite plain to see, as the cap was preserved. On examining the head, a contused wound was observed at the middle of the sagittal suture. With the probe, the bone could be felt fractured and somewhat depressed. The patient was perfectly sensible, said he had no headache, and there was absolutely no symptom whatever demanding interference. I thought it likely, from the oblique blow the skull must have received, and from the absence of any symptoms, that the fracture might not be extensive, probably

involving the outer table only, and that it would be wiser to let the patient alone. He got on quite well for ten days, never during that time suffering even from headache. I thought he was going to recover. Then he appeared to become stupid, and persistent hiccough came on. On the 12th of September, I made a crucial incision, through which were removed several loose pieces of the skull which had been pressing on the brain. I found the dura mater intact. The operation was not followed by any change for the better, and he died on the 18th September. No *post-mortem* examination was made. Possibly the result might have been otherwise had an operation been performed in the first instance. But in the absence of symptoms it is usually wiser not to meddle.

Case XX. forms a contrast to the last. It was one of simple scalp-wound, with exposure of the bone, received on September 1st. Neither fissure nor fracture could be discovered in it, nevertheless, the right side of the body was completely paralyzed. On the 10th September, the power of motion had partly returned to the arm, but the leg still remained paralyzed. The man was discharged on the 22nd with imperfect use of the leg persisting, but otherwise convalescent.

Case XXI.—Chaumont received a small scalp-wound, exposing the bone. He died quite pyæmic, and with well-marked trismus. I have not notes of any other cases of pyæmia following scalp-wound with injured skull, but it is a very frequent result in both military and civil practice.

The principles on which to conduct the treatment of injuries of the head are so generally recognised as to need little allusion to them here. One point regarding which opinions vary somewhat is respecting the treatment of depressed fracture, unaccompanied by symptoms, and with an external wound. When there is

no wound, he would be a hardy operator who should cut down upon a depression in the skull, in the absence of any symptoms of compression. When there is a wound, however, the case is different; but even here I question much if the surgeon ought to do more than simply remove such loose fragments as can readily be got at. Where depression of the skull and symptoms of brain-injury coexist, it may seem advisable to interfere. As a general rule, however, the largest proportion of good results will obtain amongst those cases where the amount of operative surgery has been at a minimum.

September 5th.—Every morning at six o'clock we hear the lively strains of martial music, to which the unfortunate French prisoners, many of them sick, footsore, and half-starved, are daily marched out of Sedan, on their road to Germany.

To-day I was annoyed to find that a cut I had received on the finger had become poisoned, and that the lymphatics up the arm were inflamed. I had a smart rigor, and felt very unwell for a day or two, but then I got quit of it, and, although I afterwards repeatedly jagged myself with needles, and had several cuts on my fingers, which were constantly being dabbled in the offensive discharges from wounds, it seemed, strange to say, as if the first inoculation had procured for me future im-

munity, for I experienced no further trouble from that cause whatever, although the hospital was for a long time in a very poisonous state.

On account of the indisposition I felt, I went out for a walk towards Balan, where I first visited my two amputation cases, which I had not seen since the battle. Mr. Blewitt had been taking capital care of them, and they were doing first-rate. I then, with Dr. Frank, saw several of his more interesting cases. He had about one hundred and twenty patients, chiefly Bavarians, under his care, most of them at this time getting on well. They were distributed, part in the Mairie, part in the houses of the village, and it occupied both Dr. Frank's and Mr. Blewitt's entire time, for they were alone, to attend to them. They just worked, they told me, quietly all day long, and in that way succeeded in getting over their patients. They were at that date just about to take possession of a beautiful château, belonging to the Comte de Fiennes, the château of Montvillet, in a lovely park, with nice old trees, an orangery and aviary, with splendid gardens, and ornamental waters around it. A more lovely spot I never saw. This château is at the now famous town of Bazeilles, or rather what was once a town. When I saw Bazeilles, it was a heap of smoking ruins, literally a city of the dead. The sloping lawn of the château had been the scene of a fierce

fight, and many were the wooden crosses dotted over it. Dr. Frank organized a hospital here, and the wounded soldiers treated in it were in clover during their convalescence. It was beautiful autumn weather a good part of the time, and I often saw them wandering about the orange-trees with their crutches or their bound-up arms or heads, or paddling about the lake in the pleasure-boat. Dr. Frank offered me the use of the place as a convalescent hospital for our secondary operations, but we found it impossible to manage it.

Indeed, the country all about Sedan is very lovely, consisting of undulating hill and dale, with the Argonne mountains in the distance, with the Meuse meandering through the valleys as much as does the Meander itself. The natural beauty of the country serves only to throw out into blacker, more fearful relief, the horrible desolation of the battle-field.

Case. XXII.—That evening, before I returned to Asfeld, I assisted Frank to amputate the thigh of a poor *chasseur de Vincennes*, named Lyon. He was only just then brought in from the field, having lain in a trench, where he had been wounded, until that very day. He said, I am sure with truth, that for two days before the battle he had not tasted food, and that he had had hardly anything since. He was struck by a Bavarian ball, which flattened itself out against the right femur a little above its middle, shattering the bone extensively. The accompanying wood-cut shows the altered form of the bullet. He told us that for four hours after he fell he was lying under the hail of the *mitrailleuses*, whose fire passed just over him. The limb was

greatly swollen and emphysematous in the neighbourhood of the wound; but his pulse was good, his face tranquil, and his courage prodigious. The first thing Lyon demanded was a cigar, and this he continued to smoke until with reluctance he laid it aside in order to inhale chloroform. The operation was most beautifully performed by oval skin-flaps and circular division of the muscles. No blood was lost. And although the amputation was through the upper third of the thigh, the shock was comparatively trifling. The first thing the brave fellow did, on rousing out of his chloroform-sleep, was to demand his cigar, saying that he might as well finish it whilst we were getting ready to amputate his limb. He went quite gaily to bed when assured that all was over, and, puffing his cigar the while, declared that he did not now care how many of his legs we cut off. Such a man should have recovered, and every one was shocked and grieved to find symptoms of tetanus supervene on the fifth day. These increased in violence, and he soon died. No doubt the exposure and privation to which this gallant fellow was subjected, enough, as it were, to kill three men, had been the important antecedents in causing the attack of tetanus.

I found the ball lying close against the femur. It seemed spread out against the bone somewhat

Fig. 2.

as is a pellet of clay when thrown against a wall. The wood-cut represents the surface from the bone, the one next it was smooth and flattened.

Dr. Frank had two or three cases of perforating chest-wounds, in which, with marked temporary relief, he made free counter-openings for the escape of fluid accumulated in the pleura.

We also had at Asfeld a very large number of wounds of the chest, about which there could be no manner of doubt that they were penetrating. As near as may be, half of them died, some from the immediate inflammatory consequences of the wound, some from mere exhaustion, and others from pyæmia. Two bullets were cut out of the back, as is elsewhere mentioned, in one of which a piece of clavicle was imbedded, while a portion of rib was found sticking in the other. The latter is figured in the wood-cut. It is a needle-gun

FIG. 3.

bullet which traversed the right lung from before backwards. It was cut out from beneath the skin of the back.

In four instances, the ball which lodged in the lung had first traversed the centre of the deltoid muscle, and passed straight through the head

of the humerus, before piercing the thoracic cavity, just as in the case I saw at Balan the night of the 31st August. Of course, operative interference of any kind was not thought of under these circumstances. It would have been, I think, rather reckless surgery.

In some instances of penetrating lung-wounds, as I have mentioned, the clavicle was fractured, in others, one or more ribs, in several, one of the scapular fossæ was perforated.

Case XXIII.—Reyet, 3rd Chasseurs, was shot through the infra-spinous fossa of the right scapula. The ball passed forwards and upwards, smashing the centre of the right clavicle as it emerged. In spite of so extensive an injury, the man rapidly recovered.

Case XXIV. illustrates the tenacity with which life clings to some persons. Captain Fournel was shot through the left lung, and through the pelvis on the opposite side, with implication of the serous sac of the peritoneum. He was also shot through the forearm. Notwithstanding great difficulty of breathing, and acute peritonitis, along with pneumonia, he lived until September 8th.

The lung was, however, completely traversed several times, in which the injury appeared to give rise only to the most trivial symptoms after the first day or two. Invariably there had been profuse hæmoptysis and difficulty of breathing, lasting often two or three days.

I am sure the plan so unhesitatingly denounced in the report of the Surgeon-General of the

United States Army, is a bad one, and worthy of the censure with which it is there stigmatised—viz., hermetically closing chest wounds. On the contrary, the better practice would be to make free counter-openings, and let the collections of purulent fluid, almost sure to supervene, have the readiest possible means of escape.

We treated a considerable number both of shell and bullet-wounds which extended around the walls of the chest without penetrating into the pleural cavity. I have seen bullet-tracks ten, and even twelve inches long, not causing penetration, or even fracturing the ribs whose elasticity and freedom of motion must, to some extent, protect them. In several instances we had one or more ribs fractured, always producing more or less serious symptoms, and sometimes even death. We had a remarkable case in which a bullet traversed the axilla from behind forwards. The points of entrance and exit were such as to make it seem impossible that the great vessels and nerves could escape. Yet there was no damage done to any important part.

Of penetrating wounds of the abdomen we saw but few, and the subjects of these died rapidly of peritonitis and shock. We were not tempted, as was suggested by an eminent German professor, to perform an operation, as if for ovariotomy, to find out the perforated stomach, intestines, or

liver, as the case might be, sew the wounds up, clean out the cavity of all clots and foreign substances, close the external wound, and then hope for a favourable result. I fear the hope of such a success will have to be deferred for a very long time.

We treated several instances of wounds of the abdominal parietes without penetration. There was little that was peculiar about them, and it is sufficient to cite one example.

Case XXV.—Blondel was sent to us from another ambulance on the 14th September, having been wounded by a fragment of shell on the 1st. Dr. Clarke extracted two large pieces of lead-casing, photographed with the other shell fragments in Plate I., which had lain imbedded in the abdominal muscles all that time, causing very little trouble. The patient soon recovered sufficiently to leave the hospital. It is a little remarkable that such weighty masses of metal could have remained so long in a superficial wound without falling out.

In the first of the plates a number of shell fragments have been heliotyped. Those alluded to above lie immediately to the right of the entire shell.

We observed two or three examples of extensive subcutaneous ecchymosis of the abdomen and thighs from shell-explosions, which did not cause further mischief. And in one instance, a man was knocked clean over by a bomb bursting near him. He was bruised, but sustained no more serious injury, although the shell must have exploded

close at hand. In contrast to an effect so slight, was the injury sustained by two *infirmiers*, who were killed at the gate during the bombardment of September 1st. They were lying together, a sort of confused heap of scorched and blackened flesh, perfectly shapeless. Their heads were partially blown away, so were the pelvis and lower extremities in each of them. In fact, they lay a shapeless mass of *débris*.

In connection with injuries of the trunk, the following cases of pelvic wound are of considerable interest.

Case XXVI.—Jean Allary, 5th Regiment of the Line, was wounded on the 1st September. The ball entered the outer side of the left thigh, three inches below the great trochanter, and slightly anterior to it. The wound of exit, much smaller in size, was situated a little to the left of the fourth lumbar vertebra. He was admitted to Asfeld, September 10th, and when the dressings were removed, a large quantity of fluid fæces came away from both wounds, chiefly from the inferior one. The patient himself remarked that all he swallowed flowed the wrong way. When the abdomen, which was neither swollen nor painful, was pressed upon, the bowel contents could be made to jet out through the wound in the thigh. In the course of a fortnight the aperture in the loin closed. In three weeks exactly the fæces ceased for a time to flow by the lower opening. This wound re-opened for a short time, but when the patient left the hospital, on October 8th, the discharge had ceased, and he was quite convalescent. Allary was lying down when he was hit, and the ball must have twice perforated some portion of the descending colon without opening the peritoneal cavity.

Case XXVII. was also an example of double fæcal fistula.

The ball entered near the apex of Scarpa's space on the left side, and emerged through the centre of the right buttock; fæculent matter flowed from both wounds, but the convalescence was rapid. In this example, the rectum must have been traversed. It would be interesting to learn if any constriction followed upon recovery.

Case XXVIII.—Hautefeuille, a young fellow of twenty-two years of age, a soldier of the 1st Marines, also wounded on the 1st September, was struck by a ball, which entered on the left side of the coccyx, traversed the rectum and bladder, and emerged just above the symphysis pubis. For a considerable time all the fæces passed by the posterior opening, while the urine flowed entirely from the anterior wound. He recovered without one single unfavourable symptom. Both wounds had closed by the 18th September, and remained so until his discharge from hospital on September 25th, when he appeared as well as if nothing had happened to him.

In a Belgian ambulance I saw two cases of urinary fistula recovering without a bad symptom. In one the ball had entered just above the pubic symphysis, and as it had not made its way out, the patient will probably have to submit to a future operation for the extraction of the bullet, as was the case with a soldier wounded during the American War, from whose bladder a piece of shell, weighing 898 grains, was successfully removed by the lateral operation. In the second case the ball entered just above the tip of the right trochanter major, passed through the iliac bone, and emerged a little to the left of the symphysis pubis. In both these instances no

untoward symptoms were manifested. I saw, on September 20th, at the Château de Bazeilles, under Dr. Junker's care, in a man who had been wounded on the 1st, another instance of bladder injury. The ball had passed through the body of the pubis, and emerged through the right buttock. The urinary fistula persisted, and some pieces of bone had been extracted by Dr. Junker, but the man was going on well.

The Château de Bazeilles is situated just outside the burnt village, and close to the scene of a hotly contested fight between the Bavarians and the French Marine Infantry. It is an old French château, with ornamental gardens, and quaint statues on the terraces. It overlooks the winding Meuse, and belongs to a French general *en retraite*. It was, during the battle, speedily filled with wounded from garret to cellar, and the old-fashioned ornamented rooms, with their antique furniture, formed a place but very ill-adapted for the reception of wounded men.

There were some other cases of similar injury which I did not see, but which, I was informed, were doing well. *A priori*, one would certainly not expect that such serious visceral lesions should produce so little constitutional disturbance. But when the pelvic fascial layers are intact, wounds of this form usually do well.

CHAPTER VI.

September 6th.—There is nothing very eventful to remark of this day. Some of us paid a visit to the camp of French prisoners, of which so much has been said in the newspapers. At least 100,000 men were confined on an island, formed by a canal and a branch of the Meuse. But few of them had any cover, and food of every kind was exceedingly scarce. It had been raining for several days, and the ground was churned into mud ankle deep. At every step, some of the soldiers, seeing our red crosses, would stop us, say they were very sick, and beg to be taken to hospital. They looked what they said, poor fellows, but we could do nothing. The colonel of the 4th Chasseurs d'Afrique, the Marquis de Galliffet, asked me if I could give him some quinine, as he was then suffering from an accession of African fever. He was out in the drenching rain like the rest, protected only to a certain extent by the hood of a rude *char à banc*. I gave him the quinine, and he begged

me in return to accept his Arab horse. It is a beautiful animal, and I brought it home with me. It served me when in Sedan, in place of my own horse, a very good one, which I had brought from Paris, and which was stolen from me. The only difficulty was to feed him, fodder being almost unattainable, so his daily dinner consisted for some time of the fragments of stale bread which had been left uneaten by the patients in the wards.

September 8th.—I find I have mentioned in my diary that even up till this date large numbers of dead horses lay unburied, and that it would be several days before all could be put under ground. A great many also had to be killed and thrown into the river. There was no food for the unfortunate beasts, many of whom, like their masters, had been severely wounded. To-day, for the first time, we got our boots cleaned, and towels to dry our faces after washing — luxuries to which we were previously quite unaccustomed, and which we appreciated accordingly.

On the 9th, 10th, and 11th of September, 102 new patients were sent to us from different other ambulances. All were cases of very serious injury, and some had been previously subjected

to amputation on the field. This influx of patients overcrowded us a good deal, and we were most anxious to get tents, into which we could put any cases of fever or of erysipelas which might arise, and those patients threatened with pyæmia, also cases likely otherwise to poison the hospital atmosphere, so as thus to relieve the *encombrement* of the wards. Of course there were many amongst these new cases on whom operations required to be performed. There were injuries so severe that one could scarcely understand why any attempt whatever had been made to save the limb. I suppose it was everywhere else the same as it was with ourselves, far too much work for the surgeons to do.

For instance, it was so in the following example.

Case XXIX.—Guerieri, 4th Marines, wounded on September 1st in three places, was admitted to Asfeld on September 10th. A ball had traversed the right thigh without injuring the bone. The left tibia was extensively smashed, and so was the upper part of the left femur, close to the trochanters. He was in a very weak exhausted state. It was evident from the moment we first saw him that it was hopeless to attempt to save the limb, but his condition was not such as to warrant immediate interference. He was accordingly carefully tended and fed; and on the 18th, when he had made a considerable rally, it was decided to afford him the only chance he had, that of disarticulation at the hip-joint. The operation was performed in the usual manner with a long anterior flap, and the femoral and other arteries were twisted. The poor fellow died very shortly afterwards. He never rallied from the effects of the shock,

and I think the amount of chloroform he took had a large share in the rapidity of the fatal issue. In no operation, perhaps, does the administration of chloroform demand greater carefulness than in this one.

Case XXX.—The only other instance of disarticulation at the hip at Asfeld was admitted also on the 10th. The upper and back part of the left thigh, as well as a great portion of the outer side of the limb, had been carried away by a shell-explosion, which tore off a considerable portion of the left buttock as well. As the bone was uninjured, and also the main vessels, an unsuccessful attempt had been made before admission to preserve the limb, or at all events to avoid immediate amputation at the joint, a procedure so uniformly fatal. This, however, failed, and the operation became necessary on the 15th September. The flap required to be made of unusual length, and was taken from the inner aspect of the limb, as the soft parts on the outer and back part of the thigh were almost completely removed. The femoral was twisted. The after-shock was considerable, but the administration of brandy and beef-tea produced, after some time, a good reaction. The man was placed in a tent by himself, with a special attendant, and under the particular charge of Dr. Nicholl, who was most assiduous in his care of him. On the next day, the patient's condition was excellent, the pulse 120, and pretty strong; he had slept and eaten well. For five days I felt quite sanguine as to his ultimate recovery. Each day he appeared stronger and better. On making my evening visit on the sixth day, however, I found Liprendé, for that was his name, weak and exhausted. He said that the attendant had neglected him all day, and that he had got neither food nor wine. It was, unfortunately, too true. The rascally *infirmier*, tired of his work, had bolted, leaving his unfortunate patient to take care of himself. He had been seen two or three times during the day, but, as he made no complaint except to myself in the evening, the neglect was not discovered till too late to remedy it. I do not say that the patient would otherwise have eventually recovered,

but there was everything about him and his condition to make us hope and expect that he might do so. He died, however, during the course of that night.

Mr. Blewitt disarticulated the hip at Balan, but with no better success than in our two cases.

Four cases of resection of the elbow-joint were admitted on the 10th. One of them had been only partial, and proved fatal. In another, amputation had to be immediately performed. The joint had been cut out through a transverse incision across its posterior aspect. There was no attempt at repair, and the wound was a large hole, into which one might almost put a closed fist. The forearm was only attached to the arm by a narrow isthmus of skin and muscle in front. We received some other cases of resection of the elbow, which had been performed outside in this manner—that is, by a transverse in place of a longitudinal incision. The men told us that they had been operated upon by German surgeons, but the method adopted is one which would find little favour in this country.

A few cases of injury of the spine were admitted about this date, of one or two of which I may here give particulars.

Case XXXI.—Jean Pujolle, farrier in the 5th Cuirassiers, was wounded in two places on the 1st September. He had received a flesh-wound, caused by a fragment of shell, in the

right arm, and his neck was traversed by a ball, which, entering opposite the anterior edge of the left sterno-mastoid, at the mid-point of the muscle, emerged a little to the right side of the fifth cervical vertebra. On his admission, nearly a fortnight after the injury, we found the body almost completely paralyzed, from the chest downwards. The respiration was diaphragmatic, the cheeks were flushed, the countenance was exceedingly anxious, and the bronchial tubes were partially choked with mucus, which was only imperfectly expectorated. The pulse was 110. Both arms were completely paralyzed,—there was not a trace of power of motion in either. The left leg was completely paralyzed, but there was slight power of voluntary motion in the right. We found, however, sensation almost perfect in the left leg, while there was none in the right, and we found complete sensibility to touch in the right arm, while the left was quite anæsthetic. Reflex action could be excited in the paralyzed leg. The patient passed both urine and fæces involuntarily. Frequently he cried out on account of pains in his limbs, and the slightest movement in bed caused him great agony. The temperature was usually very high. In this helpless condition this poor creature lingered on. Each day we hoped death would rid him of his great suffering. Bed-sores formed of course, but his general condition remained throughout pretty much as I have described it. I expected before I left to have had an opportunity of performing what must have proved a most interesting autopsy. The patient, however, did not give up the struggle till after I quitted Asfeld. I transferred him, with a few others, to the care of the surgeons of a Dutch ambulance just arrived at Sedan, who faithfully promised they would make a *post-mortem* examination and let me know the result. I regret much it has not been done. I have written on the subject to know, and received a reply in the negative.

Case XXXII. is somewhat remarkable in consequence of being an example of almost exactly similar injury. Bonnevey, wounded on the 1st, was also admitted on the 10th September.

The ball entered through the upper part of the right sterno-mastoid muscle, and emerged two inches and a half to the left of the *vertebra prominens*. The right side was completely paralyzed. He died the following day, and there was no leisure at this time for any *post-mortem* examination.

Case XXXIII.—Pescher was shot in the region of the second lumbar vertebra. He was also one of the later admissions. A careful search was made for the ball, and it was found impacted in the body of the vertebra, having smashed the transverse processes. It had become, doubtless, altered a good deal in shape, for, though it could be seized by the forceps, no reasonable efforts sufficed to remove it. A few pieces of cloth were alone pulled out, and a short time after, very profuse hæmorrhage occurred. The wound required to be plugged to arrest it, and the patient died the same afternoon, the day, in fact, he was admitted. This case illustrates one of the dangers attendant on meddling with bullets deeply lodged in the spine; and it shows that in some cases the extraction of a bullet, even with a good hold of it, is no simple task. We had a few other cases of spinal injury, but it is unnecessary to mention any details concerning them.

The great number of buttock-wounds which we had under treatment is sufficiently remarkable. They were of all shades of severity—some being slight flesh wounds, caused by the grazing of a shell or piercing of a bullet, while in others, the greater portion, or even the whole, of the glutei muscles of one side had been carried away by the explosion of a shell, and the ilium or sacrum injured at the same time. We had in all about eighteen such cases, and since it is true that the valiant Maréchal de MacMahon was wounded in this region, it can be taken as

no indication of want of bravery if a soldier should unfortunately be struck there.

Case XXXIV.—Claude Saunier, artilleryman, was wounded by a piece of shell on September 1st. He was admitted to Asfeld twelve days afterwards. We then ascertained that almost the whole of the left ilium was exposed, as well as the upper part of the sacrum. The glutei muscles were, on the left side, completely stripped off the bone, and torn from their attachments throughout almost the entire length of the crest of the ilium. On the right side of the sacrum, the soft parts were also much injured, and the sacrum itself was fractured. The entire length of the wound was twelve inches, and it was six inches wide at its broadest part. In the bottom, a considerable portion of the sacrum lay exposed, and almost the whole of the dorsum ilii, which was fissured in several directions. A portion of bone seven inches long and five inches wide was exposed, black and dead. The wound around looked healthy, the granulations were springing up at the edges. Some fragments of bone showed signs of beginning to loosen. The patient lay constantly upon his face. His bowels were regular, he passed urine readily, and his appetite was good. He suffered absolutely from nothing. He was twenty-two years of age, and looked a placid, good-tempered fellow. Nothing was done save dressing the wound carefully, until October 6th, when I extracted several inches square of the outer table of the iliac bone, which had become loose. The whole length of the crest itself would in time exfoliate, but, although loosened, it was not as yet ready to come away. I transferred this fellow, in the best possible condition, to the surgeons of the Dutch ambulance, on October 8th, who subsequently removed the loosened crest of the ilium. From first to last the wound seemed to give but very little annoyance. Saunier never complained, and I never saw in his face an expression in the very smallest degree indicative of suffering.

In a letter I received from my Dutch friend,

he reports that on November 21st Saunier was doing quite well, a large portion of the *crista ilii* had been removed, and the wound had filled up so nicely that he was able to go about on crutches. We may therefore fairly assume his final convalescence.

Case XXXV.—Jean Cabirol, 22nd Regiment of the Pine, was wounded and admitted to hospital the same day as Saunier, and the nature of his wound was very similar, though not quite so extensive. It involved, however, about half of the left buttock, the muscles being torn away, and the bones exposed and fractured, both the ilium and the sacrum. The right buttock was also extensively lacerated, but it did not look by any means so horrible a wound as the last. Until September 25th, Cabirol got on pretty well, when he had a rigor, followed by sweating. The left leg began to swell enormously, into a condition of hard œdema, probably from occlusion of the iliac vein, and he died on October 1st with all the symptoms of pyæmia. A *post-mortem* examination showed well-marked hypostatic congestion all over the front of the body. He had been lying constantly upon his face, like the last man. The left profunda vein was found to be full of pus. There could be no mistake about it. The pus was seen flowing up whenever the part was compressed, after slitting up the femoral vein, which, as well as the iliac, contained a soft red clot. The liver contained numerous abscesses, and in the lungs was a number of large yellow softish masses, like tubercle, which must have been deposits of pus, not yet softened down into ordinary abscesses.

There were two cases in which buttock-wounds proved fatal from secondary hæmorrhage, and it may here be observed that the secondary hæmorrhage so frequent in gun-shot wound is one of the most serious of complications. It

indicates that the fluids of the organism are vitiated by some poison, pyæmic or other. The already weakened forces of the constitution are still further lowered by the losses of blood, difficult to check, and ever ready to return, and the result generally is, that the patient yields in the struggle, whether the original injury be very severe or one comparatively slight. The main vessel of the injured part may be ligatured, but too often this serves merely as a temporary check, and if the patient do not succumb previously to the disordered state of his blood, the bleeding will probably recur when the ligature falls. The great frequency of secondary hæmorrhage has for its chief causes the absence or faultiness of sanitary conditions, and the debility of the patients reduced by privation from nourishing food, as well as the exhaustion and exposure to which they have been previously subjected. The means calculated to remove or anticipate such evils will, if applied, be of more value than is the ligature in coping with secondary bleeding after gun-shot injury.

About this date, Sept. 11th, we had a visit from Captain Brackenbury, chief representative on the Continent of the English National Society for Aid to the Sick and Wounded in War. His appearance was most acceptable. Up to that time we had heard nothing from the outside world. We knew not if Paris were besieged or taken, or if a vic-

torious Republic had routed the hitherto irresistible German legions. Soon after his visit, we received stores of all kinds—blankets, bedding, food, and surgical assistance at the hands of several members of the English Society. Amongst others, Dr. Markheim, Mr. Marcus Beck, Dr. Duncan, and Mr. Parker. What we had been up till then relying upon were the stores which we had brought with us from Paris, partly supplied there by the French Society, and in part too by the English. During all the time we were at Sedan, the French Military Intendance supplied us with rations and with wine, and with a staff of hospital servants. Dr. Sims has, in his report, already awarded a just tribute of praise to the lady-nurses, Miss Pearson, Miss Macloughlin, Mrs. Mason, Miss Barclay, and Miss Neligan, who arrived also about this time. I cordially endorse what he has said. I only wish we had had them from the outset. In that case, lives which were sacrificed through want of adequate nursing, or rather through the absence of any proper nursing at all, might have been saved.

Women are better adapted, both physically and morally, for the charge of the sick than men. They should, however, in order advantageously to fulfil their mission of good, be adequately trained, and then they become simply invaluable. No male nursing is to be compared to woman's, and

I am sure both the French and German soldiers, in our hospital at least, very much preferred it. Female aid cannot, perhaps, be rendered available on the battle-field itself, but there seems to be no reason why it should not be procurable immediately afterwards.

To-day we tasted, for the first time since our arrival, a most welcome treat. Some cans of Irish preserved milk, which is most excellent, reached us. This pleasure was, however, more than counterbalanced by a discovery which we made the same day. During the heat of the bombardment of September 1st, a couple of fugitive Zouaves made their way into an underground cistern of water which supplied the hospital, all other supply from the town having been cut off. They went in to escape one form of death, only to meet, poor fellows, with another. They were drowned, and their bodies were not discovered until the water becoming low in the cistern, it was found necessary to descend into it to get the daily supplies for the house. I did not object to eating horseflesh, to which for a day or two we were reduced, although I confess I did not like it, but, when we discovered the nature of the infusion with which we had been washing it down, I admit that I for one, and I believe all the rest also, felt very uncomfortable, and we did not drink any more water for some time.

CHAPTER VII.

September 12*th.*—All our tents, supplied to us by the *Intendance Militaire*, were by this time pitched. They were thirty-six in number, and were soldiers', not hospital tents, calculated to hold eight persons each. We considered four about the proper number. The tents were spread over the hospital enclosure, now made clean, and trenches were dug around them to keep the inside dry. We were busy distributing some of our cases amongst them, when the even tenour of our way was disturbed by the arrival of a message to prepare to receive a number of fresh cases of sick and wounded, and forthwith the patients appeared, borne upon stretchers. The weather was as bad as bad could be, cold and stormy, and the rain came down in torrents, without a moment's cessation. The inequalities of the coverlets over the men served but to form receptacles for little pools of water. There were one hundred and thirty of these

poor fellows, all French, sent up to us that fearful day. Some of them were in a truly wretched plight. These patients were transferred to us from the ambulance installed in the fine large building of the College or District Public School, previously occupied by the wounded French, who were removed by the German authorities to make room for their own wounded. And this was done, under the circumstances which I have detailed, in most villainous weather. These patients were not convalescents. There were amongst them two cases of tetanus. One of the patients died on the day of his arrival, two died the following day, several in three or four days afterwards. Some absolute necessity for it, or some adequate explanation, may be forthcoming of what certainly appeared to us at the time, and under the circumstances, a most unwarrantable and cruel act. I, for one, should be delighted to receive an explanation. But, as it stands, the case seems to me to be a distinct violation of the Geneva Convention, since a wounded man becomes *ipso facto* a neutral, and should cease, so far as the doctors are concerned, to possess any nationality whatever. I would not dwell upon this painful topic, but that it had so direct and unfortunate an influence upon our own well-being. Upon the accession of so many fresh cases, the hospital became at once fearfully overcrowded. One

hundred and five of the new-comers had sustained serious injuries, demanding in many instances severe operations. The remaining twenty-five were cases of fever and dysentery.

Very few days passed until the wounds of our original patients began to alter in appearance for the worse. Secondary hæmorrhage became frequent, and, worst of all, some of our best and most promising cases of operation began to show symptoms of pyæmia. Nearly all the patients, in fact, sickened more or less. The difference was felt even amongst the staff; for one and all of us got attacks of some sort of illness. One had severe diarrhœa, another a feverish attack, a third violent headache, a fourth an attack of vomiting, and so on. Dr. Sims alone amongst us was happily exempt.

There can be little doubt that the overcrowding which we suffered from at this time was a most potent cause in inducing an increased death-rate. For instance, in thirty-three cases death arose from acute pyæmia, in its most typical form of rigors, followed by drenching sweats, diarrhœa, jaundice, and finally death. The *post-mortem* examinations revealed multiple abscesses, often in the joints and limbs, but most frequently in the liver and lungs, never in the spleen or kidneys. Without doubt, the agglomeration of bad cases has, whatever else may have, a great

deal to say to the production of pyæmia. That many other deaths besides were due to the same cause I am very certain, although it has not been so recorded.

Amongst the patients admitted during the first two days of September, and those sent in on the 9th, 10th, and 12th, the deaths from pyæmia were about equal, namely, seventeen of the one class, and sixteen of the other. It is perhaps noteworthy that of the seventeen deaths from pyæmia, occurring amongst our original patients, twelve took place between the 21st and 27th days of the month, seven of the twelve being on the 21st and 22nd September. Again, eight of the sixteen deaths from pyæmia amongst the patients admitted from the 9th September to the 12th September took place also from the 20th to the 27th of the month, five of the eight being on the 20th, 21st, and 22nd September. Assuming the duration of a case of acute pyæmia to be from ten to fourteen days, this would determine the commencement of the disease as the very time at which we became encumbered with the influx of new cases.

I am aware it is rather dangerous to draw large deductions from limited premises, but it is a fact well worthy of remark, that so many as twenty of the thirty-three noted deaths from blood-poisoning took place within a very few

days of each other, and that twelve of the twenty occurred within a few hours of each other. If the disease run an approximately fixed course as to time, the inference clearly is, that it commenced in these different cases about the same date, and other considerations fix that date as being from the 9th to the 12th of September, when the large numbers of fresh patients were crowded in upon us.

In the great majority, pyæmia was found to arise only in those cases in which the bone had been injured, or in which amputation had been performed. It was far more frequent also after secondary than after primary amputations.

Before proceeding to consider wounds of the extremities, with or without fracture of the bones, necessitating in some cases amputation, in others resection, I should wish to narrate briefly the particulars of some other cases of pelvic gunshot injury.

Case XXXVI. — Lieutenant Sécheras, *Chasseur-à-pied*, was struck by a ball on September 1st. The point of entrance was three inches below the tip of the great right trochanter, but a couple of inches anterior to the bone. The point of exit was almost symmetrically placed on the opposite side, being three inches below the tip of the left trochanter. In place, however, of being in front of the femur, it was two inches behind that bone. The urethra was wounded, but not completely divided by the ball in its passage across. There were frequent

fits of retention of urine, and the greatest difficulty was experienced in introducing the catheter. The laceration, which was in the lower wall of the urethra, could be distinctly felt while the instrument was being passed. The particular charge of this case, as well as of the other wounded officers, of whom we had nearly one hundred, was entrusted to Dr. Tilghman, than whom none could be more faithful or intelligent in the discharge of his duties. He conducted this case to a successful issue, and the officer left the hospital quite convalescent, and warned of the necessity for combating the tendency to traumatic stricture which must inevitably ensue after a contused wound of the urethra.

In two other instances, where the upper part of the thigh was pierced, a large part of the scrotum was torn off. In one case the testicles were injured, and in the other the corpora cavernosa were almost completely divided, the urethra being left intact. Recovery took place in all.

CASE XXXVII.—COLOMBAIN, a soldier of the line, was struck by a bullet just over the right anterior superior spine of the ilium. He must have been carrying his watch just at the place where the ball struck, for it was carried bodily into the wound. Dr. Duncan extracted portions of the watch and of cloth from over the sacro-iliac synchondrosis of the same side. Unfortunately, the watch was not in such a state of preservation as to be of much further use as a time-keeper. The man made a good recovery, and was discharged convalescent from hospital.

In another case, a Prussian bullet entered external to the anterior superior spine of the ilium, striking the bone obliquely. It lodged

in the buttock, whence it was cut out, presenting the curious flattening shown in the cut. No fracture, or injury of the bone could be detected, and the patient soon perfectly recovered.

FIG. 4.

We had altogether 152 cases of injury to the upper extremity, twenty-one of which terminated fatally. These may be analysed and tabulated in the following manner:—

	Cases.	Deaths.
Wounds around the shoulder not penetrating the joint	7	0
Penetrating wounds of the shoulder-joint	6	3
Wound around the elbow-joint not penetrating	1	0
Penetrating wounds of the elbow-joint	15	6
Gun-shot wounds of the arm without fracture	33	1
Gun-shot fractures of the humerus	25	11
Gun-shot wounds of the forearm without fracture	22	0
Gun-shot fractures of one or both bones of the forearm	10	0
Gun-shot wounds of the hand with and without fracture	33	0
	152	21

The operations which these injuries entailed were as follow:—

	Operations.			Deaths.		
	Prim.	Sec.	Tot.	Prim.	Sec.	Tot.
Disarticulation at shoulder-joint	1	1	2	1	1	2
„ elbow-joint ..	0	2	2	0	2	2
„ wrist-joint ..	2	0	2	0	0	0
Amputation of arm	14	6	20	6	3	9
„ fore-arm ..	4	0	4	0	0	0
Partial amputation of hand ..	12	0	12	0	0	0
Resection of shoulder-joint ..	1	3	4	1	1	2
„ elbow-joint ..	4	7	11	1	5	6
Double resection of shoulder and elbow-joints in the same arm	0	1	1	0	0	0
Resection of three-fourths of ulna	2	0	2	0	0	0
Total	40	20	60	9	12	21

There were, besides, three instances of double amputation in the upper extremity. In one case, the arm and forearm were removed, in another, amputation of the arm and disarticulation at the shoulder were performed. Both these patients died, but a double forearm amputation which had been performed, recovered.

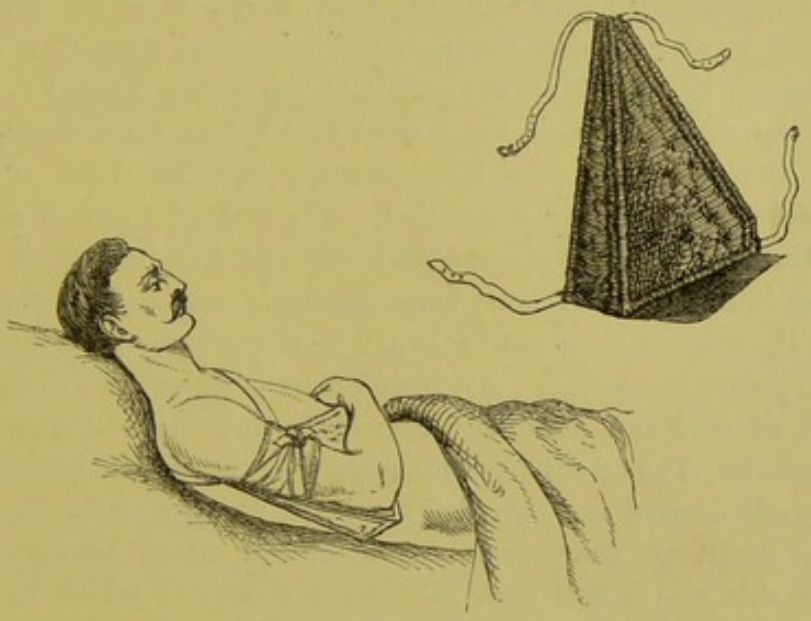
On the whole, the recoveries, both after wounds and from operations, in injuries of the upper extremity, are, as might be anticipated, tolerably satisfactory for military practice. The proportion of deaths, both after amputation and resection, was comparatively small, and the patients recovered well, with scarcely any exception, from simple flesh-wounds. The proportion

of deaths among the fractures of the upper arm seems very high, but in many of the cases so noted, amputation had to be performed, either primarily or at a subsequent period.

While on the subject of gun-shot fracture of the upper arm, I should like to notice the triangular cushion used by Stromeyer, that veteran authority in military surgery, for the treatment of such fractures. He has observed, he told me, the excessive danger which exists of producing gangrene, or other unfavourable result, when any constricting apparatus is applied to the fractured upper limb, and he says there is a fatal facility for gangrene to occur if any tight bandaging or splints be applied, and the circulation is materially interfered with. The cushion may be described as a right-angled isosceles triangle, four inches thick at the apex, which rests against the chest and supports the elbow, the fore-arm being bent at a right angle with the arm. The cushion gradually thins down till the base is a mere edge, and of the two other angles, one is passed up into the axilla, while the other rests on the chest under the wrist. The cushion is readily fastened in its place by a tape round the neck, and one round the body. When this simple apparatus is applied, the arm rests upon it, beautifully supported, and in excellent position. Whilst lying in bed, nothing beyond the

ordinary dressings are required for the wound; and if the patient need to be transported from one place to another, or is fit to walk about, this can be arranged for with the utmost facility, as cushion, arm, and all can be bound by a broad bandage to the body, and thus form an immoveable whole. Stromeyer himself told me, so highly did he estimate the value of this

FIG. 5.



Stromeyer's Cushion as applied for Gun-shot Fracture of the Humerus.

cushion, that he considered it the most valuable appliance he had invented during his life, which is very strong language from a man who, like him, has done so much for surgical science.

I have tried this mode of treatment myself, and found it answer every purpose. The cushions are very readily made, and can be manufactured

of different sizes. A very good size is one in which the sides measure about fourteen or fifteen inches in length.

I may here put upon record one or two of the more interesting cases of injury of the upper extremity which fell under our notice.

Case XXXVIII.—Roux, a soldier of the Marines, was wounded on the 31st August by a fragment of shell striking the front and outer part of the left shoulder. The greater portion of the pectoralis major was torn away, and part of the deltoid muscle, leaving between the two wounds a species of bridge of skin and other tissue. Most of the deltoid was in fact divided across, and the wound in front was a deep hole five inches in diameter. The shoulder-joint was fully opened, and the head of the humerus somewhat comminuted. The first and second stages of the axillary artery were exposed, and the beating of the great humeral vessel was very distinctly seen. The clavicle and the scapula were not broken. This patient was treated in a very simple manner. All loose pieces of bone were removed, both at first and whenever afterwards they were disposed to exfoliate. The wounds, which were of enormous size, were carefully dressed and attended to by Mr. Hayden, who deserves great credit for the painstaking attention which he bestowed upon this, and indeed upon all the other cases of which he had the care. Pieces of bone from time to time came away, and the wounds began to fill up. Three weeks afterwards, the report states that the patient had been getting on admirably, and was then all but convalescent, and that the expectant mode of treatment had proved most satisfactory. The Dutch surgeon under whose care he was left wrote me a report up to November 21st of this and the other cases left behind, and I am sorry to chronicle an unfortunate issue to this man's history. "Roux," he writes, "died a few days ago. At first he was doing nicely. The caput humeri, and also a large piece of the humerus, became loose, and had been removed; the wounds had been filled up

with good granulations, but an attack of fever and diarrhœa soon made an end of him." His death, therefore, could not at an interval of ten or eleven weeks be attributed, except indirectly, to the injury from which he was then rapidly recovering.

CASE XXXIX.—I mention the following case, not for its surgical so much as for its psychical character. PAYEN, a private soldier in the 50th Regiment of the Line, received a gunshot wound which traversed the left wrist-joint, shattering the bones so extensively as to render resection of the articulation impracticable. The soft parts were also a good deal injured. I amputated in the middle of the forearm, and the patient was removed to the next ward to bed. The curious part is to follow.

I should also mention that our operations were performed at the end of one of the wards opposite the large window, and in the presence of a number of the patients. Since all the beds, for a considerable time at least, were full, we could not empty any portion of the hospital to make an operating theatre. The operation was performed on September 1st, and during that entire day we were exposed to the heavy fire of the Prussian batteries just opposite, whose shells often struck, but fortunately never entered, the hospital-building. The constant whizzing of the shells in our ears was anything but reassuring. But, to return to our patient. In about ten minutes after he had been sent to bed, he left his own ward and returned to the operating-

ward, whilst we were administering chloroform to a poor fellow whose leg required amputation. We were all amazed at Payen's *sang froid.* He asked for a cigar, which he commenced to smoke, and chatted to those around him unconcernedly. We could not persuade him to return to bed, and as we had not any time to lose, he was permitted to remain. He inspected all the steps of the operation with much interest. He said he could not understand in his own case why he had felt no pain, and he wanted to see how such a feat of magic was accomplished. After he had seen the stump put up, he returned to bed perfectly satisfied. It is perhaps unnecessary, though not without interest, to add that this young man rapidly recovered. His wound healed almost by the first intention, and he left the hospital on the 22nd of September, quite well.

I do not think I have anything to note about amputations of the arm. They were generally performed with oval skin-flaps and circular division of the muscles. In respect of the mortality after this operation, we find, as before stated, that it is very large. The cases of double amputation were, with one exception, fatal. In one curious case, the same ball traversed both arms without injuring the trunk.

CHAPTER VIII.

I HAVE now to speak of resections as performed in the upper extremity. There were but four of the shoulder, eleven of the elbow, and none of the wrist. There was one remarkable case, to be given afterwards in detail, in which I performed resection of both the shoulder and the elbow joints in the right arm. A reference to the table will show the proportion of secondary to primary resections, and the deaths after each, which were much greater in the former than in the latter type of operation. Of the four primary elbow excisions, only one died; while of seven secondary, so many as five perished. Resection was performed whenever it was practicable in injuries of the upper extremity. Amputation was never practised for gun-shot injury of the elbow or shoulder, which would admit of excision of the injured joint. On the whole, the results may be pronounced satisfactory. I shall, however, quote the particulars

of the case of excision of the shoulder, which proved fatal, as an example of how our very best operations proved fatal under the pyæmic influences which became so rife amongst us. In a second case a very similar result had nearly ensued.

Case XL.—Gaugeard, a nice young fellow, a *sous-lieutenant* in the 53rd Regiment of the Line, was wounded at three o'clock on September 1st, near Balan. The ball passed through the head of the right humerus from before, backwards. The head and two inches of the shaft of the bone were removed by means of a single anterior incision, and carbolic dressings were somewhat carefully applied. On September 3rd, the wound was dressed. It was almost all healed. Some serous fluid flowed from it. There was neither general nor local disturbance. On September 9th, he was going on extremely well. He had so far no fever nor other untoward symptoms at any time. So runs my brief report. In short, the patient was so far convalescent as to be walking about with his arm in a sling, quite happy and comfortable at the thought of his limb being preserved to him. He was regarded by everyone as quite convalescent, when, on the 14th, we noticed beads of sweat upon his face, he had complained of feeling hot before, there was no distinct rigor, but the sweating became very profuse. The skin soon assumed a sallow tint, and his eyes became sunken. An attack of secondary hæmorrhage, the prelude to the fatal issue, took place on September 21st; and, on September 22nd, he died. Thus in a short ten days ended one of our best and most promising cases, and this is but an example of what happened in a dozen similar instances.

Case XLI.—Gallerand, *Maréchal du Logis* 7th Artillery Corps, was wounded on September 1st by a ball which entered behind the left shoulder-joint, and, passing directly forwards, smashed the head of the humerus, and emerged in front. He was only sent to Asfeld on September 12th. On September

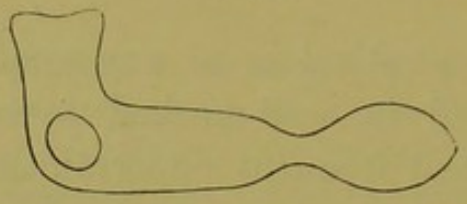
14th, I excised the head of the bone, just as in the last case, by a single anterior incision. Up till September 29th the patient got on famously, and then symptoms threatening pyæmia made their appearance. He also had sweatings, but no marked shiver. Fortunately, these unfavourable symptoms soon abated, and GALLERAND made an excellent recovery. He left the hospital perfectly convalescent on October 6th.

I am very sceptical as to any treatment being of much avail in well-marked pyæmia. Some time ago, I had frequent opportunities of trying Professor Polli's antizymotic treatment by the bisulphites of soda or magnesia. It always appeared to me to do a good deal of harm, and never much, if any, good. Diarrhœa was induced by it, as well as vomiting, the abdomen swelled up with flatulence, and food was soon rejected. Perhaps the internal administration or inhalation of carbolic acid, which in the hands of some would seem to prove an universal panacea, might succeed better. It would be well worth a trial, although I did not feel disposed to accord it one at Asfeld. For myself, I can place but little reliance in anything save quinine and opium, and plenty of fresh air, and not much even in these means, for staying the progress of acute pyæmic poisoning. When once fully developed, it is very rarely checked.

We had, as before mentioned, no cases of excision of the wrist-joint, but I may take this opportunity of mentioning the excellent apparatus of

Professor Esmarch, who has treated cases of resection of the wrist with great success. The hand and arm are placed in a prone or semi-prone position on the splint (Fig. 6), whose form is such

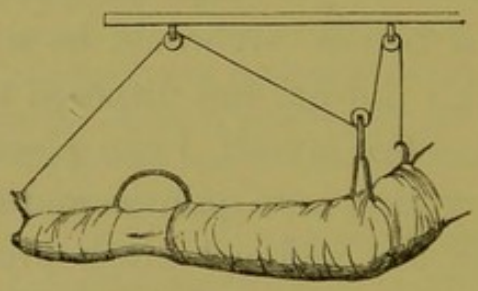
Fig. 6.



Professor Esmarch's Splint for Resection of the Wrist.

as to leave the wrist exposed, and easy to be got at for the application of dressings. The whole apparatus *en fonction*, consisting of a suspending rod, a plaster of Paris, or other form of bandage, and the splint, is represented in Fig. 7, and the

Fig. 7.



The Splint applied.

facility with which the patient can move about in bed, or readjust the position of his arm, is at once perceived. Dr. Patrick Heron Watson's anterior splint for resection of the knee-joint,

and the American anterior fracture-splints, are similar in principle and application.

A modification of this apparatus might readily be applied in cases of resection of the elbow. But, unless for purposes of transport, it is not often necessary, nor even, I consider, desirable, to apply splints of any kind to excisions of this joint, any more than to those of the shoulder. The after-purpose of the operation is to secure free motion in the new articulation, and the arm and elbow can usually be adequately and well supported by pillows. I myself never used any form of splint after excision of the elbow, and I found that great comfort to the patient, and great facility in applying new dressings, were thereby secured.

Besides those cases operated upon in hospital, several cases of resection which had been performed elsewhere were sent to us, and in some of these a very rough-and-ready method had been adopted for entering the wounded joint. The operator had cut transversely across the back of the elbow from one side of the limb to the other, sacrificing the ulnar nerve, of course, and making a huge unsightly wound. Pott's plan of a single longitudinal incision was the method I adopted in all save one instance, when I used the H-shaped cut, on account of the nature of the wound. The single incision may cause the operation to be

perhaps somewhat more tedious, but it gives sufficient room, inflicts less damage on the soft parts, and the cicatrix is more satisfactory than after any other operation. The incision should be made towards the inner border of the olecranon, and, by keeping the edge of the knife close to the bone, the ulnar nerve need be neither exposed nor endangered. I did not consider it expedient to attempt sub-periosteal resection. In several instances, amputation was performed for injuries of the elbow, but then the injuries were so extensive as to preclude the idea of saving the limb, and had ordinarily been produced by the explosion of a shell.

The number of cases of penetrating wound of the elbow under our care was very considerable. In the great majority, resection was performed at once, as all secondary operations do so very badly. In a few cases of elbow wounds, for one reason or another, expectant surgery received a trial.

CASE XLII. is an example of recovery from penetrating wound of the elbow-joint, without operation. VIVIEN was wounded by a ball which entered half way between the internal condyle and the olecranon process of the left arm, and emerged in front of the articulation over the head of the radius. The joint was therefore traversed from behind, forwards, outwards, and slightly downwards. An examination revealed but a comparatively small amount of damage. The patient was a healthy young man, and it was decided to give him the chance of getting

better without operation. The case turned out in every way satisfactory, and he left the hospital convalescent.

Case XLIII.—Auguste Soitel, 89th Regiment of the Line, presented another example of penetrating wound of the elbow, in which recovery took place. He was struck on September 1st by a ball which entered the posterior surface of the elbow, just over the head of the radius, breaking that bone. The ball emerged, after traversing the joint, a little above the internal condyle. No serious symptoms were manifested, and the man soon left hospital convalescent.

The following may be taken as an example of the cases sent into us from without, in which an operation for excision of the elbow had previously been performed.

Case XLIV.—Louis Deroy was wounded on September 1st by a ball in the right elbow-joint. An operation had been performed in a Prussian field ambulance, on September 3rd, for removal of the injured joint by means of a single transverse incision across the back of the articulation. The patient was admitted to Asfeld on September 5th. The case did not get on well, and, on September 20th, the arm was amputated most skilfully by Dr. Wyman. The patient eventually recovered, leaving hospital on October 6th.

Case XLV.—Fauvartel was operated upon by excision of the joint in a manner precisely similar to Deroy, for a shell wound of the elbow, but in his case a fatal result ensued from exhaustion, without further operative interference.

Case XLVI. deserves especial mention, as it is of unusual interest, and, I believe, unique in operative surgery. Louis St. Aubin belonged to the 3rd Chasseurs d'Afrique, a corps which has distinguished itself for extreme gallantry in every action in which it has been engaged. This young man, only twenty-three years of age, had his horse shot under him, after receiving

a bayonet thrust in his left cheek, the only one I saw amongst all the cases that came under my notice. He then got separated from his comrades. They had been in action all day. It was the fatal 1st of September, and the French troops had been routed and were flying towards Sedan. ST. AUBIN, though wounded and alone, had no notion of turning his back upon the enemy. He provided himself with one of the numerous Chassepôts lying about, and shortly after fell in with a small party of Marines, a corps who have also proved themselves amongst the very finest troops in the French army. These brave fellows, a mere handful, started forward to meet the enemy. But they had not gone far before the deadly fire from the Prussian batteries laid several of them low, and amongst the rest ST. AUBIN, who was struck by the fragments of an exploding shell on the right arm, which severely wounded both the shoulder and elbow joints. He came under our care on September 12th, not having in the interval received any special treatment. On examination, we found both the head of the humerus and the elbow-joint extensively shattered. The soft parts were in both regions lacerated and contused. The injuries were so extensive that amputation seemed almost imperative, but I determined to attempt to save the limb if the extent of the deeper-seated injury would at all admit of it. The poor fellow himself would not consent, all we could do, to take chloroform, so much afraid was he we might take advantage of his being asleep to amputate his arm, a mutilation which, under any circumstances, he naturally enough refused to hear of. The operation had, therefore, to be undertaken without it, and, on September 14th, I thus proceeded to excise the shoulder-joint. It was only needful to extend the original wound, which had torn the deltoid muscle on its outer and anterior aspect, and through this I removed, in large fragments, nearly three inches of the upper end of the humerus. The operation was necessarily a protracted one, and the brave fellow bore it throughout, including the sawing of the bone, without a single murmur. I never saw such powers of endurance. It was, however, too much for my courage to inflict so much needless suffering, and, after faithfully promising to

him that I would not amputate his arm, I succeeded, almost having to use violence, in making him inhale chloroform, before I attacked the elbow. I found the injury was here chiefly confined to the radius and the ulna, which were a good deal split up. I cut off a thin slice of the condyloid end of the humerus, and removed the fractured portions of the bones of the forearm. The original wound was here, also on the back of the joint, in such a position as to admit of its being utilized in making the preliminary incision. The operation completed, the patient was removed to bed, and the injured arm laid carefully on a pillow. Antiseptic dressings and careful syringing of the wound constituted the after treatment. ST. AUBIN'S courage never flagged He never complained. "J'ai du courage, moi," he used to exclaim, and even when he was at the very worst, he would always assert, "J'en guerirai."

Up till September 23rd, he got on well, and then pyæmic symptoms declared themselves. His temperature rose very high. His skin became yellow. He had rigors, and was delirious for a time. Then a deep abscess formed high up in the left side of the neck. I thought he was going the road so many others were travelling just about this date. However, he rallied, as such a brave fellow deserved to do. The abscess was opened, and a quantity of unhealthy pus discharged. The wounds began to look extremely well, and his spirits and appetite regained once more their wonted sway.

On October 8th, he was transferred, with the few other remaining patients of the Caserne d'Asfeld, to a Dutch ambulance just then arrived in Sedan. The Dutch surgeon to whose care he was entrusted, courteously communicated to me the report of his condition up to November 21st. He says: "ST. AUBIN does not make much progress. The wound of the shoulder is healing up quite well, but at the elbow large abscesses have formed, which have undermined his constitution considerably. However, during the last few days he was again improving. He is now in the Civil Hospital at Sedan, under the care of Dr. Duplessy, Surgeon in Chief of the Military Hospitals."

A short time since, I had the satisfaction of receiving a letter

dictated by the poor fellow himself, in which he says, with grateful expressions :—" J'espérais écrire moi même, mais mon bras est plus malade depuis votre depart. Il est très enflé, de plus il s'est formé au coude quelques abcès qui me font souffrir, cependant j'ose vous le dire Monsieur, je ne me laisse pas abattre, j'ai du courage. Si vous étiez là j'en aurais davantage. J'ai bon appetit, je n'ai qu'à me louer des soins dont je suis l'objet. Je me trouve bien à l'hôpital."

It is to be hoped, for many reasons, that this brave young Frenchman will completely recover; and it will become an interesting question to learn what amount of usefulness an arm, from which both the elbow and the shoulder joints have been excised, will possess. I trust I shall be in a position, at some future time, satisfactorily to solve the problem. I have given in Plate II., Fig. 2, a heliotype representation of the portions of bone removed, which will serve, I trust, to enhance the interest attaching to this case.

CHAPTER IX.

September 13*th.*—Some short extracts from my diary of this date may not be uninteresting. I find it mentioned in this day's report that, after a busy morning's work, I walked out to Balan, where I assisted Dr. Frank to disarticulate an arm at the shoulder-joint, and Mr. Blewitt to amputate a thigh. I also performed an amputation of the thigh myself. When I returned to Asfeld in the afternoon, I found a poor fellow who had been sent about from one ambulance to another since September 1st, having been wounded in the thigh on that day, and I performed amputation of the thigh in his case also. I heard that 19,500 cigars are requisitioned daily from the inhabitants for the troops, and other things in proportion.

September 14*th.*—There were more operations to be performed again to-day, as indeed there were every day. Twelve o'clock was the hour upon

which we had now fixed as the time for performing such operations as were required. At first they used to be done at all hours—indeed, as it were, all day long, but, for several reasons, it was convenient to fix upon a particular time as soon as we were able to do so. To-day I had occasion to excise two shoulder-joints and one elbow-joint, to amputate the thigh, and to perform excision of the knee-joint, the only instance in which I performed that operation. It proved fatal, just as, I believe, have all resections of this joint during the present war.

September 15th.—I excised an elbow-joint, and amputated the thigh for a gun-shot smash of the femur. My thigh amputation of the 13th at Balan proved fatal to-day. My first case of amputation at the hip-joint died also to-day, having survived the operation only four days. The femoral artery had been twisted. There was no hæmorrhage. I suppose this is perhaps the largest arterial trunk to which torsion has been ever applied.

We were all put on the alert to-day by the circumstance of double sentries being posted all round the ramparts. The drawbridge, which we had to cross on entering the hospital precinct, was raised in the evening, and some of our staff were shut out that night, as, not being aware of

the change, they had remained till rather late in the evening in town. The alert was a false one. Bazaine was reported to have made that sortie from Metz which, in point of fact, he never did make, although opinions may differ as to the possibility of his having been able or willing to do so. From this time forth we were in a certain sort prisoners on *parole*. The sentries at the gate allowed the members of the Staff to go in and out during the day, but no one else, without special permission, could pass, and at night we were shut in as securely as in any fortress.

An incident, very unpleasant, and which might have been attended with the most serious consequences, occurred about this time. One of the junior members of the staff, who had recently joined, went out one evening in the dusk to forage for trophies. He passed into the deep wide ditch outside the ramparts by a covered way beneath them. He had not pursued his innocent avocations very long until the hail of the German sentry from one of the ramparts above recalled him to a sense of the situation. The unfortunate young fellow knew not a word of German, and but little more of French. Not much time, however, was lost in words or attempted explanations. The German soldier did not understand the nature of the appeal made to him, so he

solved his difficulties by firing. The dusk and a not unnatural acceleration of his pace saved our young friend, who got round the sheltering corner of a bastion, and gained the covered way again in safety. It is perhaps unnecessary to add that this gentleman was very careful in future not to venture much out after dark. Of course we remonstrated about this rather summary treatment, but were told that the sentries had orders to fire at once on any one found straying out after nine in the evening, who could not give the countersign, or otherwise account for himself. The difficult circumstance in respect of times such as these is, that a mistake, once made, is impossible to rectify.

September 16*th.*—To-day I tied the subclavian artery on the right side, for secondary hæmorrhage after amputation of the arm. The bleeding was stopped, but the poor fellow ten days afterwards died pyæmic.

Case XLVII.—Louis Dessoyes, *maréchal du logis*, 2nd Artillery, was wounded on September 1st. His arm was amputated in the upper third on September 3rd, in the Eglise St. Charles of Sedan, and he was transferred to our care on September 9th. He was doing well until September 17th, when serious secondary hæmorrhage occurred, and we were obliged to tie the subclavian artery. I cut down upon its third stage in the usual way, and the artery was then occluded by twisting a loop of silver wire round it, instead of tying a piece of

silk. Dr. Sims applied the silver wire with the dexterity and address which characterize all his operative procedures. The wound in the neck never gave any trouble. It healed up very kindly, and for some time we thought all would go well with our patient. By the 25th, symptoms of well-marked pyæmia had become fully developed. On the 26th, he was delirious, and on the 27th, he died. We found, at the *post-mortem* examination, abscesses in the left knee, left shoulder, right shoulder, and between the layers of the abdominal muscles. No internal abscess was discovered. The artery at the seat of ligature was carefully examined. A large firm clot occupied the vessel throughout the second stage up to the seat of ligature. In the distal portion of the vessel, hardly any clot was found. Had further hæmorrhage occurred in this case, it would have come, as usual, entirely from the distal extremity.

This mode of occluding a large vessel is not new. Dr. Le Vert, in the American *Quarterly Journal of the Medical Sciences*, many years ago published the results of a series of experiments in which he applied metallic ligatures to the arteries in dogs, and others of the lower animals. Dr. Stone, of New Orleans, at the instance of Dr. Physick, has tied a wire round the carotid and external iliac in the human subject, and with good results. The question is one which deserves further investigation, although in the present instance the termination proved so unfortunate.

September 20th. — Six thousand five hundred of the wounded after the battles of August 31st and September 1st have up to this date been "evacuated" on Mézières, for distribution

thence to different parts of France and Germany. These men were sent either to France or Germany, according to the category in which they had been arranged by the medical officers. Those certified as slightly wounded, and able to serve again in a month, were sent to Germany as ordinary prisoners of war. Those, however, who were classed as being gravely wounded, and, though capable of being transported, unable to serve their country for a space of three months, were allowed to return to their French homes without restriction. Doubtless, at this time, just after the disastrous capitulation of Sedan, the German generals did not anticipate a prolongation of the campaign for so long a period as the subsequent events have shown. The system of speedy "evacuations," so thoroughly carried out by the German authorities by means of their admirable *Etappen* system, offers many advantages, by disencumbering the neighbourhoods of great battle-fields of the enormous masses of wounded, which the gigantic scale on which some modern battles have been fought too surely produces. There are, however, the countervailing cases of individual hardship and death caused by the transport of men weakened by injury and disease through long distances, more especially when these have to be traversed during inclement weather.

The next few days were varied by visiting Balan and Bazeilles, where our detached ambulances were, in assisting Drs. Frank and Blewitt to do some operations, inspecting some of their more interesting cases, and in paying a visit to Bouillon, in the hope of there getting letters and newspapers.

The little frontier town of Bouillon, whence the famous Godefroi de Bouillon went to wage his numerous wars, and where his picturesque old chateau still remains, is one of the most beautifully situated places I ever visited. It lies in a deep valley, surrounded on all sides by the steep slopes of wooded hills, except the narrow gorge through which flows the Samoy, a tributary of the Meuse. The view from the donjon of the castle, which overhangs the river and the village, is exquisitely lovely, and I cannot perhaps convey a better idea of the first impression the place gives, as one descends the long steep hill into the town on reaching it from Sedan, than by saying that it combines the attractions of an Alpine village, with those beauties we are in the habit of admiring in a little town upon the Rhine.

And now to continue, after this digression, the account of our wounded at Asfeld. I find that in all we had under treatment 284 cases of injury of the lower extremities, of which 66

terminated fatally. The following tables give an analysis of these cases, and of the operations that were performed on account of the injuries received :—

TABLE OF INJURIES.

	Cases.	Deaths.
Penetrating wounds of hip-joint	3	2
Penetrating wounds of the knee-joint	12	9
Penetrating wounds of the ankle-joint	7	3
Wounds around the knee-joint, not penetrating the articulation	21	2
Wounds around the ankle-joint, not penetrating the articulation	5	0
Gun-shot wounds of the thigh and buttock, without fracture of bone	100	13
Complete avulsion of buttock	2	1
Gun-shot wounds of the leg, without fracture ..	36	1
Gun-shot injuries of the foot	24	2
Gun-shot fracture of femur	27	19
Gun-shot fracture of tibia or fibula	43	14
Simple fracture of leg	4	0
	284	66

TABLE OF OPERATIONS.

	Operations.			Deaths.		
	Prim.	Sec.	Tot.	Prim.	Sec.	Tot.
Disarticulation of the hip-joint	0	2	2	0	2	2
Disarticulation of the knee-joint	0	3	3	0	3	3
Syme's amputation	0	2	2	0	1	1
Resection of knee-joint ..	0	1	1	0	1	1
Amputation of the thigh ..	5	16	21	4	14	18
Amputation of the leg	18	6	24	5	5	10
Partial amputation of the foot	7	0	7	0	0	0
	30	30	60	9	26	35

These tables point to some interesting conclusions. The great mortality of wounds of the

knee is only too apparent, nine out of twelve dying. In but one case, because it appeared so very suitable, did I attempt resection. And yet a speedily fatal result ensued. Of no rule in military practice can there, I think, be less doubt, than that immediate amputation should always be practised in gun-shot wounds of the knee clearly implicating the articulation. When the operation has, however, been postponed from any cause, the efforts of nature should generally be allowed free scope, since secondary amputations of the thigh prove so exceedingly fatal. Of eleven resections performed during the American war, nine died. One case, in which the operation was performed by Surgeon Bontecou in October, 1862, recovered, while in the eleventh case the alleged recovery was so extraordinary as to suggest doubts as to its authenticity. Excision for wounds of the knee may be successfully performed in civil practice, but is not justifiable in military. Cases where the knee-joint is really opened require to be discriminated from those in which the ball, deflected by the strong fibrous capsule of the articulation, passes more or less completely round it without penetration. We had twenty-one such instances, two only of which proved fatal. Of our twenty-seven cases of gun-shot fracture of the femur, nineteen died. Those in whom amputation was not practised were treated

by the application of the long splint to steady the limb, and extension by means of a weight attached to the foot, the weight of the body, and its friction against the bed, affording sufficient counter-extending power. In a few instances, there ensued very considerable deformity and shortening, but in some, on the other hand, the result was as good as could be desired.

Case XLVIII. affords an example of what I have just stated. Captain Thouvenel, 89th Regiment of Infantry, was wounded on September 1st. The ball entered on the inner side of the right thigh, close to the perinæum, and, after traversing the femur just beneath the lesser trochanter, emerged on the outer side of the thigh. There were, when first examined, two inches of shortening and great deformity. The fracture must have been almost a transverse one, such as those alluded to in the U.S. Surgeon-General's report, for the bone, after considerable extending force had been applied, went into its place with a jerk, and there remained. He recovered without a bad symptom, and the most accurate measurements failed, six weeks afterwards, to detect any appreciable amount of shortening. A result such as this is rare after any form of fractured femur, and is even considered by some surgeons as all but impossible.

Case XLIX.—Edouard Grundler, 2nd Infantry of the Marine, had his right thigh fractured by a ball in the upper third. He recovered perfectly with about two inches shortening.

Case L.—Louis Denoyer, 37th Line, had his right thigh fractured in the upper third. The shortening in this case amounted to one inch and a half. I have since heard that he has gone home to his friends quite convalescent.

Case LI.—Jean Goutard sustained a fracture high up in the left thigh. There were great comminution, distortion, and

tardy consolidation of the fracture. He was slowly improving when I last heard of him, on November 21st.

In somewhat strong contrast to our experience is that of Stromeyer in his ambulance at Floing, close by Sedan, where a good deal of hard fighting took place. He treated there thirty-four fractures of the femur, and in twenty-four there was, at the time of the report, a prospect of cure, four were doubtful cases, and only six died. His table of results in fractures of the leg is also very satisfactory. Out of thirty-one fractures of the tibia or fibula, or both, caused by gun-shot injury, only three died, while the result remained doubtful in six instances. Out of thirty-four similar cases at Asfeld, of fractures of the leg, as many as fourteen perished.

The mortality after operations in the lower limb was very great at Asfeld. I may say that scarcely any recovered but those in which the operation was performed immediately after the receipt of injury. Our secondary operations proved nearly all fatal. Previous privation, the exhausting influences of the wound itself, added to the unhealthy condition of the hospital at the time when these operations had to be performed, made it difficult for a single one to escape. And, in fact, some 58·20 per cent. of all those operated upon in the lower extremities perished. In contrast to this, also, Stromeyer's table, as may be seen, displays a marked difference.

FELD-LAZARETH VON GENERALSTABSARZT STROMEYER.

Condition of the Sick at Floing, 24th and 26th September, 1870.
121 patients—64 German, 57 French.

	Total.	Prospect of cure.	Doubtful.	Deaths.
Fractures of the skull . .	2	2	0	0
Face-wounds	1	1	0	0
Penetrating chest-wounds . .	14	7	7	0
Contusion of the crown . .	1	1	0	0
Fracture of the crown	3	0	2	1
Wounds of small intestine . .	1	0	1	0
Wounds of liver	1	1	0	0
Wounds of soft parts of pelvis . .	1	1	0	0
Wounds of bladder	1	0	1	0
Wounds of soft parts of shoulder	2	2	0	0
Wounds of soft parts of upper arm	1	1	0	0
Fracture of collar-bone . .	1	0	1	0
Fractures of upper arm . .	3	3	0	0
Wounds of elbow-joint . .	2	2	0	0
Fractures of fore-arm	1	1	0	0
Wounds of hip	2	2	0	0
Wounds of soft parts around femur	5	5	0	0
Fractures of the femur	34	24	0	0
Fracture of femur and tibia . .	1	1	4	6
Fracture into knee-joint . .	7	3	1	3
Injury to the sciatic nerve . .	1	1	0	0
Wounds of soft parts of leg . .	1	0	1	0
Fractured leg, not specifying which part was fractured	7	6	1	0
Fracture of both bones of leg . .	18	11	4	3
Fracture of tibia	5	3	2	0
Fracture of fibula	1	1	0	0
Fracture of tibio-tarsal joint . .	2	2	0	0
Foot wounds	1	1	0	0
	120	82	25	13

TABLE OF OPERATIONS.

	Total.	Prospect of cure.	Doubtful.	Deaths.
1. Ligature of femoral artery ..	2	0	1	1
2. Extraction of large splinters of shell	6	3	1	2
3. Resection of elbow-joint ..	1	1	0	0
Resection of portions of femur	1	0	0	1
Resection of portions of tibia	2	1	0	1
4. Amputations.—Primary ..	10	9	1	0
Double ..	1	0	0	1
Secondary..	14	8	4	2
5. Disarticulation of the hip-joint	1	0	1	0
Total	38	22	8	8

On September 1st, there were 1,200 wounded in Floing. On September 5th, the sick numbered 635 patients; 300 German and 335 French. Twenty primary amputations had so far been performed.

I have published these statistics here, having been given them by the distinguished Surgeon-General himself on the occasion of a visit to him, both on account of their intrinsic interest, and because they serve as a means of comparison with my own tables. I have little doubt that much of the difference in the results may be explained by the circumstance that most of the patients at the ambulance of Floing were treated virtually in the open air. A number of temporary houses or huts, constructed of *shingles* or rough boards, were arranged on the lawn of a chateau near the village. There were no windows in them, but the sides opened all the way along by means of large *louvres*, and, when

these were all raised, the entire circumference of the hut was laid open. There was a door at each end, a stove in the centre, and ten extempore wooden beds along each side. These *Baraken*, as they are termed, form an admirable *Feld-Lazareth*. They are only fitted, or intended, for temporary occupation, but for such a purpose are, I think, very suitable, and very much better than tents, which are liable to numerous and great inconveniences. Stromeyer had a large staff of surgeons and assistants under him, and his duties as *Generalstabsarzt* did not confine him to one ambulance. The great civil surgeons who hold the highest posts in the German armies visit the different field-ambulances at fixed times, when there are regular consultations with the surgeons attached to each on all cases of importance, and at these visits the operations are performed, which are decided upon after consultation as being needful. There can be little doubt that the advantages of such a system, both to the army medical officers themselves, and to the patients under their charge, in having the counsel and assistance, at all times and in all cases of difficulty, of the most matured surgical advice in the country, are very great. There is no undue interference, however, and I have not heard that any jealousies are excited, or that the system does not work to the immediate

benefit of all concerned. Certainly, in the case of Stromeyer, who is beloved and respected by everyone with whom he comes in contact, nothing could be more harmonious than the relations which subsisted. On the occasion of my visit to him, he paid me a great compliment by insisting on my performing an amputation of the thigh, which was required for an injury to the knee. We afterwards had a long conversation together, in the course of which he asked me if I had yet arrived at his conclusion that the practice of military surgery was unsatisfactory in the extreme. He said he was now passing through his third campaign, and that the longer he lived the more deeply was he alive to the seemingly unavoidable evils which attend the practice of surgery during war.

CHAPTER X.

Perhaps I cannot do better in concluding what is after all but a sketch, and, I fear, an imperfect one, of our ambulance work, than by giving *in extenso* a table of all the cases of injury which were received and treated in Asfeld, and of the operations that were there performed. Some of the operations, however, were not performed at Asfeld, the patients having been sent to us subsequently from other ambulances. The classification of the injuries is made mainly according to regions from the head down to the foot, which is, perhaps, the simplest and the best plan. When the injuries have been multiple, they are classed under that one which is likely to prove most dangerous to life. Besides the cases thus recorded, there have been a number where the names were never discovered, and wherein all source of identification is thus lost. There were several, too, whose names are known, but not the forms of injury from which they suffered. All

this was unavoidable, the amount of work imposed on us being simply overwhelming for the first few days.

I have prepared these tables with much care, and after a great deal of trouble. I had my own notes, and, in addition, a general registry of all the cases. By collating these two carefully I think I have been able to exclude any serious error, and to present as correct a *résumé* of our work in a tabular form as it is possible to have.

TABLE OF INJURIES TREATED AT ASFELD DURING SEPTEMBER AND OCTOBER, 1870.

	Cases.	Deaths.
Scalp wounds	9	2
Fractures of the skull	8	7
Gun-shot wounds traversing the face, or the face and neck, and in general fracturing the bones	24	5
Wounds of the face destroying the eye	4	0
Wounds traversing the neck (In one case the trachea was divided.)	5	0
Wounds of the soft parts around the shoulder-joint without penetration of the articulation	7	0
Wounds around the elbow-joint without penetration	1	0
Wounds of the soft parts of the hip and the buttock	18	6
Wounds of the buttock and various other parts	7	0
Complete avulsion of the buttock, with fracture of the ilium and sacrum	2	1
Wounds around the knee-joint not penetrating the articulation (In one case the popliteal artery was divided by the ball, causing sphacelus.)	21	2
Wounds around the ankle-joint without penetration	5	0
Penetrating wounds of the shoulder-joint	6	3
„ „ elbow-joint	15	6
„ „ hip-joint	3	2

TABLE OF INJURIES—*Continued.*

			Cases.	Deaths.
Penetrating wounds of the knee-joint	..	..	12	9
„ „ ankle-joint	..	..	7	3
Shell-wound penetrating both the shoulder and the elbow-joint of the same arm	..	..	1	0
Wounds of the soft parts of the chest without penetration; sometimes complicated with fracture of the ribs	..	14	2	
Superficial wounds of the chest and abdomen	..	4	0	
Superficial wounds of the chest and various other parts	..	5	0—23	2
Superficial wounds of the back and loins	..	..	15	2
Wounds of the back and various other parts	..	..	2	0
Gun-shot wounds of the spine—				
Cervical region	..	2	2	
Dorsal region	..	1	1	
Lumbar region	..	4	3— 7	6
Gun-shot wounds of the pelvis	..	..	4	0
Gun-shot wound of the pelvis with a penetrating wound of the chest also	..	..	1	1
Gun-shot wounds penetrating the chest—				
Wounds penetrating or traversing, chiefly the left lung	..	18	9	
By a ball first traversing the scapula		3	2	
By a ball first traversing the head of the humerus	..	4	1	
By a ball first smashing the clavicle		5	4	
Shell-wound tearing away the side of the chest and largely exposing the lung	..	1	1—31	17
Wounds penetrating the abdomen	..	..	7	7
Wounds of the soft parts of the arm without fracture	..	31	1	
Wounds traversing both arms	..	2	0—33	1
Wounds of the fore-arm without fracture	..	..	22	0
Gun-shot injuries of the hand	..	..	33	0

TABLE OF INJURIES—*Continued.*

	Cases.	Deaths.
Wounds of the soft parts of the thigh without fracture	63	6
Gun-shot wounds traversing both thighs	3	0
Gun-shot wounds of the thigh and various other parts	9	1—75 7
Wounds of the soft parts of the leg without fracture	36	1
Gun-shot injuries of the foot	24	2
Gun-shot fractures of the femur—		
Upper third	9	5
Middle third	8	4
Lower third	10	10—27 19
Gun-shot fracture of the leg, generally the tibia	41	13
Gun-shot fracture of the tibia, with simple fracture of the opposite leg ..	1	0
Gun-shot wound traversing both legs, causing fracture of one tibia, a wound penetrating the opposite ankle-joint, and a wound of the thigh without fracture	1	1—43 14
Fracture of the femur and tibia in the same limb	1	1
Simple fracture of the leg	4	0
Gun-shot fracture of the humerus	24	10
„ „ „ with wound of the thigh and buttock	1	1
Gun-shot fracture of the radius or ulna, or both ..	10	0
Burns, contusions, and sprains	31	0
Temporary loss of sight from a shell-explosion ..	1	0
Total	610	137

I have purposely avoided any record of our numerous cases of fever, dysentery, and rheuma-

tism, as they only remained for a very short time under treatment.

TABLE OF OPERATIONS PERFORMED.

	Cases.			Deaths.		
	Prim.	Sec.	Tot.	Prim.	Sec.	Tot.
Disarticulation at hip-joint ..	0	2	2	0	2	2
„ „ knee-joint ..	0	3	3	0	3	3
„ „ shoulder-joint	1	1	2	1	1	2
„ „ elbow-joint..	0	2	2	0	2	2
„ „ wrist-joint ..	2	0	2	0	0	0
Amputation of the thigh—						
Upper third	2	6	8	1	5	6
Middle third	1	9	10	1	8	9
Lower third	2	1	3	2	1	3
Amputation of the leg—						
Upper third	14	6	20	5	3	8
Middle third	2	1	3	0	1	1
Lower third	2	0	2	0	1	1
Double leg amputation ..	1	0	1	1	0	1
Syme's amputation	0	2	2	1	0	1
Amputation of the arm ..	14	6	20	6	3	9
„ „ fore-arm ..	4	0	4	0	0	0
„ „ arm & fore-arm	1	0	1	1	0	1
Disarticulation at the shoulder-joint and amputation of the fore-arm	1	0	1	1	0	1
Double fore-arm amputation ..	1	0	1	0	0	0
Excision of the knee-joint ..	0	1	1	0	1	1
„ shoulder-joint..	1	3	4	1	1	2
„ elbow-joint ..	4	7	11	1	5	6
(One case requiring secondary amputation recovered.)						
Double resection of the shoulder and elbow in the same arm	0	1	1	0	0	0
Resection of one-third and one-half of the clavicle ..	1	1	2	1	1	2

TABLE OF OPERATIONS PERFORMED—*Continued.*

	Cases.			Deaths.		
	Prim.	Sec.	Tot.	Prim.	Sec.	Tot.
Resection of considerable portions of the long bones ..	10	0	10	10	0	0
Extraction of splinters of shells and of bullets, about 150						
Partial amputation of the hand	12	0	12	0	0	0
„ „ foot ..	0	7	7	0	0	0
Resection of the lower maxilla..	1	0	1	0	0	0
Resection of the greater portion of the ulna	2	0	2	0	0	0
Total	79	59	138	23	38	61

LIGATURES OF ARTERIES.

	Cases.	Deaths.
Ligature of the subclavian artery .. .. (One was almost immediately fatal, the other died pyæmic.)	2	2
Ligature of the common carotid .. .. (Since this report was made out, the other case has proved fatal at Brussels after apparently complete convalescence.)	2	1
Ligature of the femoral (died pyæmic)	1	1
Ligature of the dorsalis pedis	1	0
Total	6	4

In preparing these tables, I found the left side of the body very much more frequently injured than the right, certainly in the proportion of not less than three to two. The left lung, for instance, was traversed nearly twice as often as the right. The left hand, fore-arm, and arm,

much more frequently suffered than the right, and the same was true of wounds of the lower extremities. The ordinary positions assumed by a soldier in firing are such as to expose the left side the most, and it was for that reason much oftener struck.

I have been repeatedly asked whether I had noticed any difference in the manner in which the French and Germans bore suffering and pain, and recovered after injury. I can only record my own impressions, derived from what I saw, when I state that I failed to observe any marked difference. Differences there may have been, but what struck me most was the resignation, both amongst officers and men, to their too often sad fate. I met with no repining, no fretfulness. The recollection which I bear away with me, and which always presents itself in the foremost place, is the gratitude that these poor fellows showed and expressed for all that we did for them. Flesh and blood have pretty much the same attributes of flesh and blood, no matter on which side of the Rhine they may have been developed. And, apart from individual characteristics, I could really detect no difference between the way in which a German or a French wounded soldier, each of whom say had sustained an injury of like severity, comported himself while under treatment.

On a reference to the table of injuries, it will be seen that there are recorded seven cases of penetrating wound of the ankle, with three deaths. Two of these deaths followed secondary amputation, the third was from exhaustion.

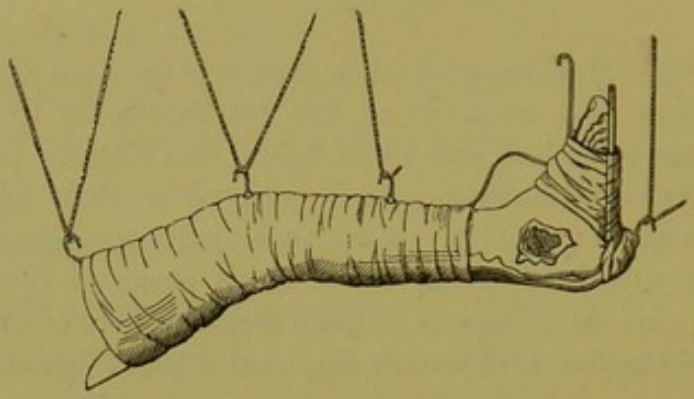
CASE LI.—HOLLER, aged 24, a private in the 53rd Regiment of the Line, was wounded on the 1st September by a ball which entered an inch and a half below, and slightly posterior to, the internal malleolus, and emerged a little in front of the external malleolus. For a time, under expectant treatment, all went well, a number of small pieces of bone were removed, and fair prospects of good recovery were entertained. But on September 17th Syme's amputation proved needful, and it was performed by Dr. Wyman. The poor fellow died with pyæmic symptoms on September 21st.

CASE LII. was also one of penetrating wound of the ankle, but recovery took place after expectant treatment. Sergeant EMILE BAUDRY was wounded on September 1st, by a ball which opened the ankle-joint just over the instep. The ball was extracted by the wound of entrance. There was a good deal of diffuse inflammation, and matters at one time did not look well, for I have marked in my note-book "Case for operation," and even decided on the 26th to excise the joint. I did not do so, however, and recovery eventually took place. We discharged Baudry convalescent on October 8th.

But for the impossibility of getting anything fixed in the Asfeld ceilings capable of supporting a swinging apparatus, we should more generally have used suspension splints, and I know of nothing better for wounds of the ankle, or for

cases in which operations have been performed in that region, than the apparatus of Professor Esmarch, as represented in Fig. 8.

Fig. 8.



Professor Esmarch's Apparatus for Wounds and Excisions of the Ankle-joint.

Case LIII.—Eugene Gaillot, Sergeant-Major of the 21st Regiment of the Line, was struck by a ball just posterior to, and a little above, the tip of the internal malleolus. There was no wound of exit, nor could the ball be discovered. For some days nothing unusual was witnessed, but then the ankle began to swell and inflame, free counter-openings were made on the opposite side, from one of which the ball, lying almost superficially, was readily removed. It was evident that the ankle-joint was now seriously involved. Every care was bestowed on this poor fellow, who was a fine handsome young man of two-and-twenty, but without avail. Fresh abscesses formed up the leg, accompanied with very profuse suppuration, and it became necessary, in order to afford him a chance of life, to amputate the limb. I disarticulated accordingly at the knee-joint, not removing the cartilage of incrustation. The popliteal artery was twisted. For some days the relief experienced was remarkable: he looked a new man, and we expected him to recover. Then he had the fatal rigor, a sweat, his appetite failed; diarrhœa and vomiting followed, and within a fortnight

he died quite pyæmic. On account of an attack of secondary hæmorrhage the day but one before his decease, I ligatured the femoral artery. This bleeding would, I consider, have taken place just the same had the ligature been applied to arrest the bleeding in place of twisting the vessels. The bullet, which must have been well-nigh spent, since it did not penetrate the skin on the opposite side of the limb, grooved deeply the lower end of the tibia, just above the articulating extremity, and caused, in addition, a spiral fracture, reaching as high in front as the junction of the middle and lower thirds of the bone. The existence of this fracture, but not its extent, had been previously ascertained.

A representation of this fracture is given in Plate V., Fig. 9. The groove in the lower end of the tibia is well seen, and also the commencement of the spiral fracture.

With reference to fractures of the leg I have not much to say. We had the large number of forty-three cases with fourteen deaths. The majority of these cases, in consequence of the extensive injury to the bone, were submitted to amputation, but a considerable number were also treated in ordinary splints, with excellent results. After an interval of three or four weeks the limbs were put up in fenestrated gypsum bandages, and then the patients could with perfect safety and great facility be removed.

The amputations of the leg were among our most successful cases, six only perishing out of eighteen primary amputations. Of the seven cases of secondary amputation four died, making

a total mortality of ten cases in twenty-five operations. The fatal case of amputation in the middle third was one where Teale's operation had been performed, and the flaps afterwards became gangrenous. It was the only instance in which recourse was had to this form of operation. The others were made simply by long anterior and short posterior cutaneous flaps, and a circular division of the muscular substance.

As might be anticipated, the penetrating abdominal wounds were all fatal. Those in the spine were also very fatal, one man only, who had been wounded low in the lumbar spine, recovering so far as to be able to leave hospital. The four cases of wounds of the pelvis all recovered, as the abdominal cavity was not implicated.

With reference to fracture of the femur, it may be observed that all who suffered from it in the lower third perished. In the middle third two survived after amputation in the upper third, and two after treatment for the fracture. In the upper third, conservative treatment was most generally adopted, and with a happy result in the four cases already detailed. Five deaths took place, two after disarticulation at the hip-joint, and three from pyæmia and exhaustion.

In the annexed figure is represented a misshapen Bavarian bullet, which caused a very bad

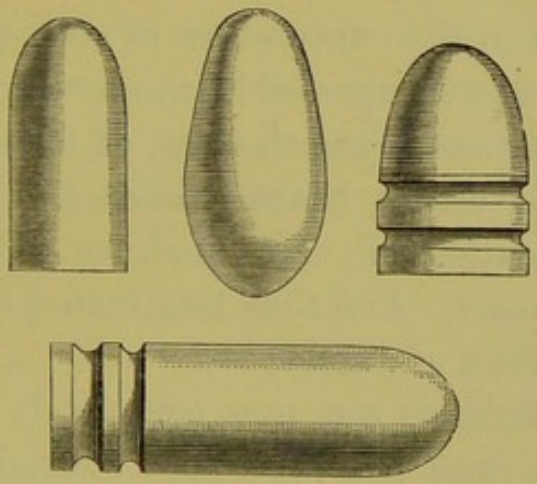
fracture of the thigh, and was extracted, with a portion of the femur firmly impacted in it.

Perhaps it may not be uninteresting to some readers were I to figure in their original shapes, the bullets which caused these shocking muti-

FIG. 9.

lations. The woodcut represents the French, Prussian, and Bavarian bullets, as well as the bullet of the mitrailleuse. The first two weigh

FIG. 10.



Chassepot, Needle-gun, Bavarian and Mitrailleuse Bullets, of the natural form and size.

respectively 380 and 500 grains, the Bavarian bullet weighs 434 grains, while the mitrailleuse ball is an ounce and three-quarters in weight.

It is somewhat curious that amongst all our

patients there was not one who had been wounded by the mitrailleuse. Either this much-vaunted weapon of offence wounds comparatively few persons, or else it must fatally injure all those whom it wounds.

There remains now but little more to say. After handing over the dozen remaining patients to the care of our Dutch friends, whose ambulance was then being installed, I started with those of our party who had remained with me to the end, for Brussels, *en route* for England, taking with us Colonel Beaudoin, to place him in an ambulance in that city. The colonel bore the journey well, and without fatigue. I parted with him a day or two afterwards with great regret, but in the expectation of seeing him soon again. I was inexpressibly shocked to hear, not much more than a month later, of his unexpected death. He was a brave soldier and a simple-hearted gentleman. He died, as I believe, of a broken heart. And thus terminated our labours at the Caserne of Asfeld.

Our ambulance was now completely separated. Part of the Staff had previously started in search of further work, under the command of Dr. Pratt, and their well-known and brilliant services at Orleans require no meed of praise at my hands. They were such as to render their old associates both proud and, it may be, a little envious. At Epernay, at Metz, and still later

in Switzerland, amongst the famished and perishing troops of the brave but beaten Bourbaki, Dr. Frank, Dr. Webb, Mr. Blewitt, and Mr. Wyman rendered services which, if not so brilliant or so exciting as those rendered at Orleans, are certainly not less praiseworthy or valuable.

The war is now over. Peace has been signed. And I can say without affectation that, through many difficulties and dangers, the Anglo-American Ambulance has successfully pursued its humane mission. I believe it has accomplished much genuine good, that it has brought aid and succour in the hour of great distress, when such aid would otherwise have been wholly wanting, and I for one shall look back, as I believe also can do every other member of the ambulance, not only with unalloyed pleasure, but also a little pardonable pride, to the humane career of the Anglo-American Ambulance.

DESCRIPTION OF PLATES.

PLATE I.

THE centre figure is a Prussian 15-pounder shell, of the kind the Germans were firing at us from their field-pieces on the 1st of September. This was the only one we found unexploded, and it was picked up while still warm. Its outer leaden casing shows the grooving caused by the rifled bore of the cannon. On each side are a number of the fragments, both of lead and iron, into which such a shell bursts. All of these, with the exception of the largest, were extracted from different parts of the body. Above are the various forms of bullets used, and a few also of those which had been removed from wounds, some of them being considerably altered in shape. A mitrailleuse cartridge is likewise shown. Twenty-five of these deadly missiles are fired at each discharge of the piece. I believe they generally kill in place of disabling the soldiers. The following description of the Prussian artillery, from the *Revue des Deux Mondes*, is very interesting:—

"The Prussian pieces belong chiefly to the models styled 6, 12, and 24 rifled breech-loaders. The weight of the percussion shells thrown by these cannons is respectively 7, 14, and 28 kilogrammes. The large Krupp cannons, of which so much has been spoken, are pieces of 48 and 96 (there are some of even still larger calibre), throwing projectiles of 50 and 94 kilogrammes to a distance of 8 kilometres. All these projectiles are cylinders terminating in an ogive, solid or hollow. The cylindrical surface is furnished exteriorly with annular projections, destined to retain an envelope or coating of lead surrounding the body of the projectile, which is of

cast-iron. The advantage of the envelope of soft metal is to force the projectile into the grooves of the piece, to suppress thus the windage or passage of the gas produced by the ignition of the powder, and as a consequence the jolting of the projectile in the bore of the piece. By this means great tension is given to the course or trajectory followed by the projectile after leaving the cannon. In other words, the range and accuracy are increased, and the penetrating power of the projectile is greater.

"The ogivo-cylindrical form of the percussion shells sent us by the Prussians is known. These projectiles burst by means of fusees styled *percutant*. At the moment when the shell strikes the ground, a small metallic stalk, terminating in a point, acts upon a fulminating capsule screwed on the head of the shell, and the powder is ignited. The shell bursts, and the fragments, to the number of a score or so, and of different sizes, are violently scattered, mostly in front, to a distance which often reaches several hundred metres. The sheaf of projection takes a fan-like form, whose centre is precisely the spot touched by the shell. The leaden coating, although strongly laminated, principally on the surface in contact with the inferior part of the bore, is itself violently separated from the shell, at least in many cases, and serves to increase the destructive effects produced by the cast-iron by tearing into the shape of large flakes, sometimes twisted and contorted in a thousand ways.

"When the capsule does not go off, as happens when the shell falls on heavy, damp, or porous soil, the projectile makes a large opening in the ground in penetrating, from fifty to sixty centimetres in diameter at the opening, and of variable depth, according to the velocity of the projectile and the nature of the soil traversed, but it may attain even two or three metres. The inclination of the hole is that which the shell had on arriving, and its direction that of the line of fire. Sometimes the shell bursts at the bottom of the chamber which it has made, and then the earth above is lifted up like a dome, and cracked to the surface. When the shell has not burst, it would be very dangerous to try to get at it without some precautions. In all cases it is well to plunge it in a bucket of water, and have the capsule unscrewed by a person of the craft. The powder is then slowly emptied, and the enormous sugarloaf of metal, clothed on all its cylindrical portion with an intact coating of lead, which here and there bears marks of the annular projections of the cast-iron, or the sharp grooves

produced by the rapid passage of the projectile in the bore of the piece, forms a kind of artistic object well calculated to tempt collectors. Towards the eye, or open part of the shell, grooved interiorly to admit of the percussion-fuse being screwed in, is a sort of inclined canal, which traverses the cast-iron from the exterior to the interior. Through this passes a small metallic spit, interposed between the capsule and the percutor. By the rapid rotatory movement made by the projectile on itself on leaving the cannon, this little spit is soon thrown out in virtue of centrifugal force, and at the moment of the shock the percutor can act freely on the head of the capsule, until then the intervention of the spit is intended to prevent all danger of a premature explosion.

"The percussion shell betrays itself on its way by a sort of peculiar whistling. This Æolian-harplike vibration is never forgotten by those who have once heard it. The whistling proceeds from the resistance offered by the air to the passage of the projectile, which possesses a great velocity, about 300 or 400 metres per second. As the velocity diminishes in proportion to the distance traversed by the shell, the intensity of the whistling also diminishes; but the noise is heard very far off, often for several seconds, and consequently at a distance of two or three kilometres. The ear easily judges of the direction in which the projectile is going, and the extreme sensitiveness of the organ becomes thus a veritable means of preservation, for the percussion shell passes so rapidly that it is not seen coming, and cannot be perceived in the air, even at night. One may hear it burst, or even be reached by it, when it is still thought to be far off. The noise produced by the explosion of the percussion shell is quite a special one. It cannot be compared to that of the detonation of a cannon. Heard at a little distance, it is a dead, dull sound, accompanied by the repercussions of the echo, and the vibrations resulting from the striking of the fragments against the walls and soil. At night there is something sinister in all this music, and if one be in the active sphere of the bombardment, that is to say, in the district aimed at and reached, there is little chance of sleep."

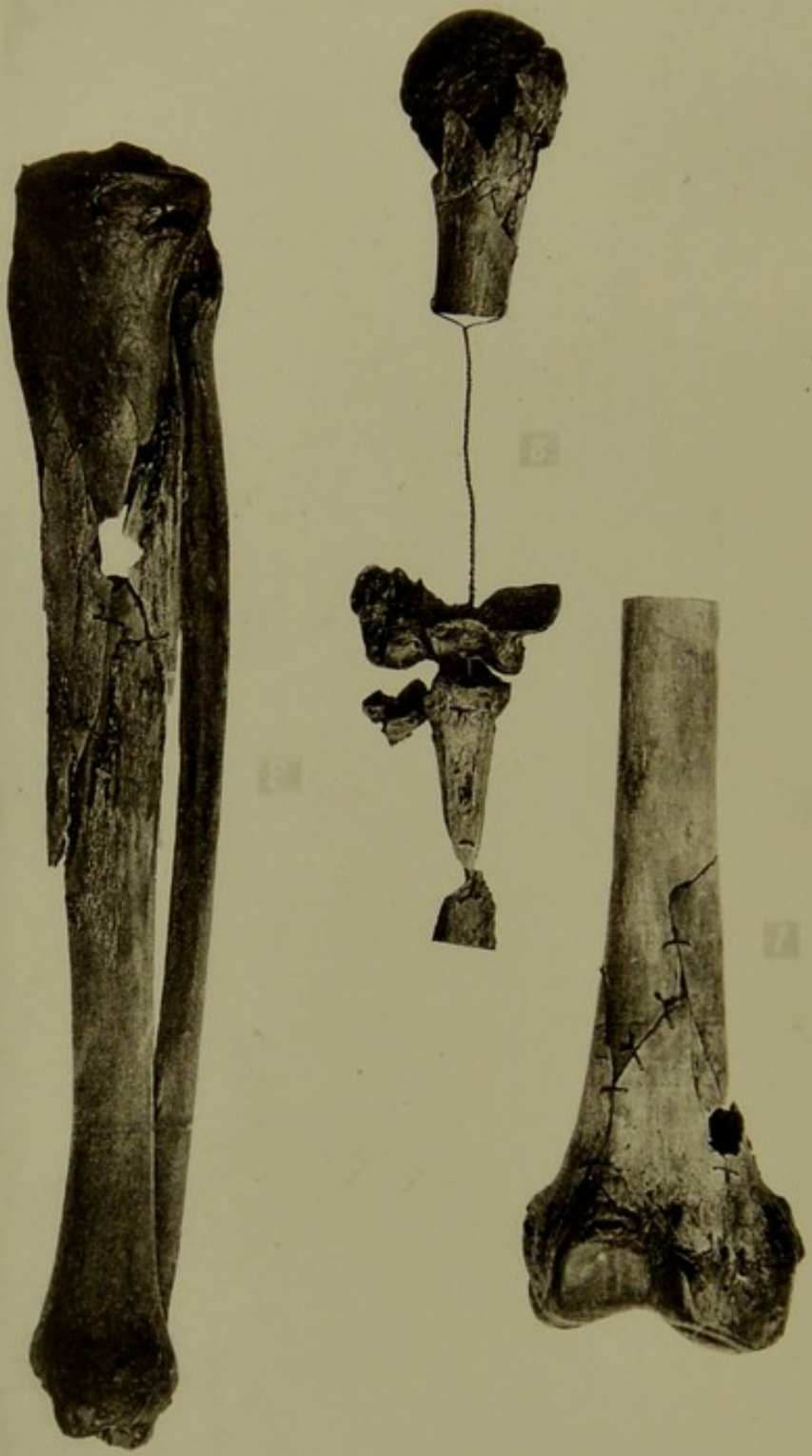


PLATE II.

Fig. 1. Near the condyles of the femur the bullet often makes a clean round hole through the cancellated tissue, as is seen in this instance. The amount of splintering is, however, enormous. In the plate is shown, a little way above the internal condyle of the right femur, the point of entry of the ball. The edges of the aperture are quite sharp externally, and bevel off inside, just as one may see them in a pane of plate-glass through which a bullet has been fired. In Plate IV., Fig. 1 *b*, the posterior view of the same specimen is given, and there the very much larger and more irregular aperture of exit may be very distinctly traced, with fragments of bone, somewhat everted, surrounding the edges. The direction of the bullet may thus be ascertained without difficulty from the most cursory examination of the specimen. In the sixth circular of the American Surgeon-General, p. 33, an injury of a very similar character is represented.

Fig. 2. The fragments removed from the shoulder and elbow-joints of the right arm of a Chasseur d'Afrique, Louis St. Aubin, the particulars of whose case, No. XLVI., are narrated on pp. 107 to 110. Several small pieces of the elbow-joint have been shot away or lost.

Fig. 3 shows the effect of a conoidal bullet traversing the right tibia at a high velocity. The hole made by the missile is small, but the splintering is most extensive. The ball has entered on the internal aspect of the bone, and emerged as shown in Fig. 3 *b*, Plate III., on the outer side. There is no great difference in the size of these openings, but the wedge-like power of the projectile is demonstrated by its having so largely split in several directions the upper half of the tibia. This specimen is from one of the cases admitted to Asfeld at a late date. An attempt had been made to preserve the limb, and a certain amount of new material has been thrown out, but secondary amputation at the knee-joint proved necessary, and the case terminated, like many of the rest, fatally.

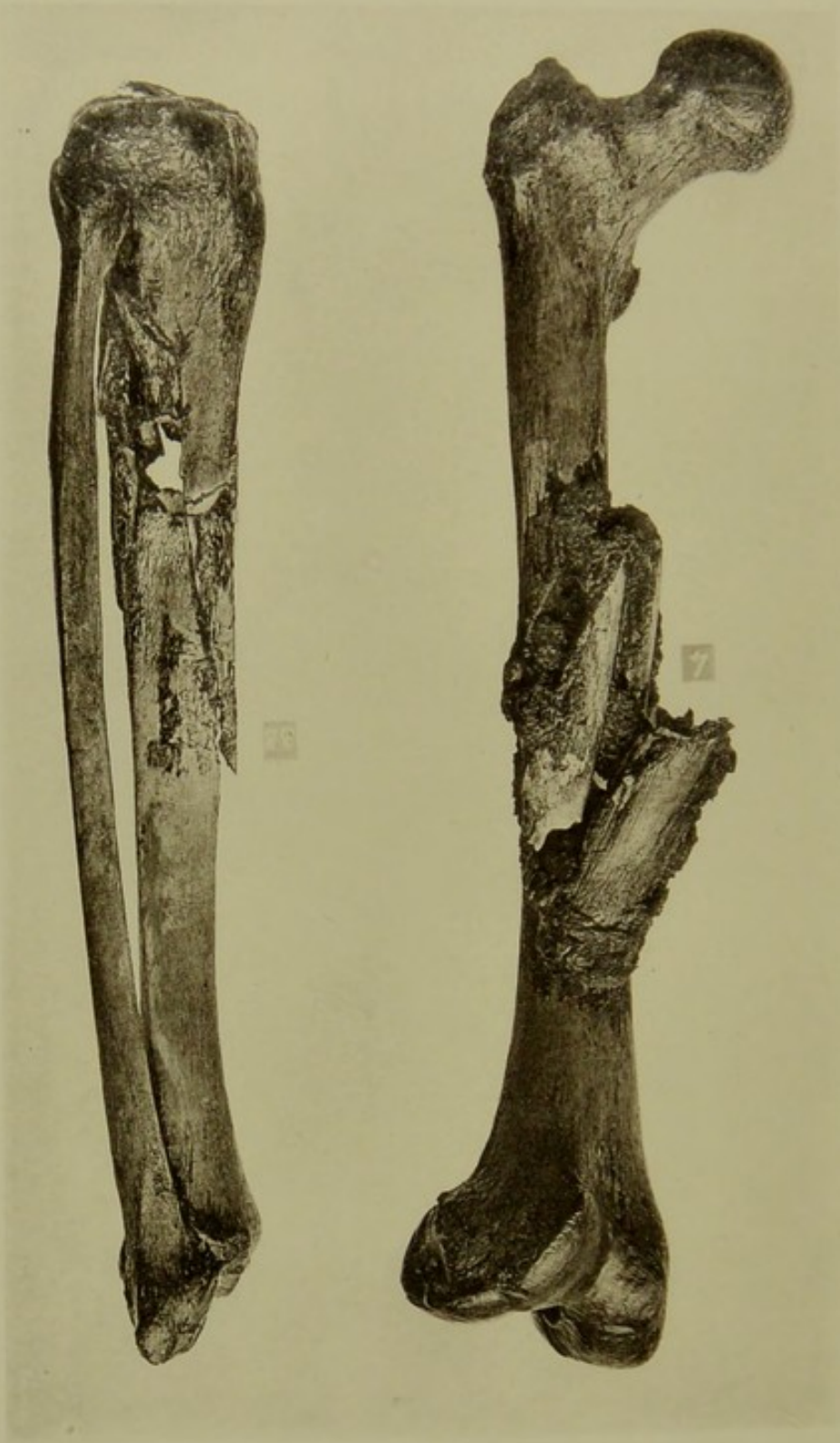


PLATE III.

Fig. 3 *b* shows the external surface of the fractured tibia last described and figured in Plate II.

Fig. 4. In this instance, also, the patient was not admitted under our care until a fortnight after the date of injury, too late to attempt any operation, as he was then in a very weak state, and soon after died exhausted. The fracture is situated at the middle of the right femur, and besides being comminuted and split into large fragments, portions of the bone were driven considerable distances into the surrounding muscles. There was a good deal of deformity and shortening. The specimen shows a certain amount of callus to have been thrown out. No. 1643, in the American Military Museum, photographed in the beautiful series issued by the Surgeon-General, is an example of an injury almost identical in form.

PLATE IV.

Fig. 5. This is a very interesting specimen. The patient from whom it was removed was wounded on the 1st Sept., and died exhausted on the 28th of the same month, with all the symptoms of penetrating wound of the chest and none other. The ball, coming from the front, entered the right side of the chest, carrying portions of the ribs into the pleural cavity. It emerged close to the angles of the second and third ribs, fracturing them both. It then, passing obliquely upwards, carried away the spines and portions of the laminæ of the 2nd dorsal the 1st dorsal and the 7th cervical vertebræ, and finally emerged through the anterior edge of the left trapezius muscle. The patient was not seen by us until admitted on Sept. 9th to Asfeld, and the exact nature of the injury was not revealed till after the autopsy was made. The spinal canal was largely laid open, and a piece of cloth the size of a florin, found lying in it. The cord and its coverings were not injured. In this way alone may be accounted for the curious fact, that there was not the smallest symptom, traceable to spinal injury, present at any time during the four weeks the man lived, and that he died simply from the consequences of the penetrating wound of the chest.

Fig. 1 *b* gives the posterior view of Fig. 1, Plate II., already described.

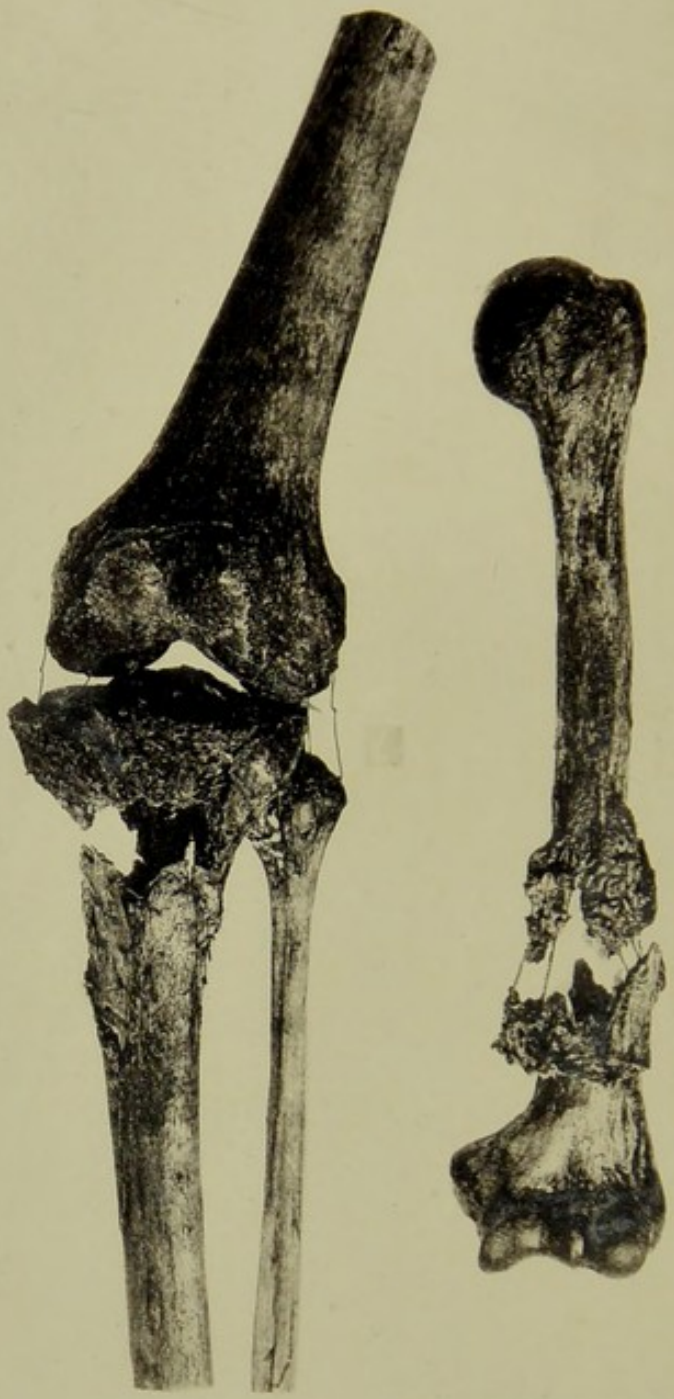


PLATE V.

Fig. 6. Left humerus, through the lower portion of which a small fragment of shell had passed. Considerable efforts at repair have been made. The patient died of pyæmia.

Fig. 7 shows a large irregular tunnel through the internal portion of the head of the left tibia, caused by a Prussian bullet. Secondary amputation was performed, but the patient died of pyæmia. The complete erosion of the cartilage from the articular end of the femur is very perfectly shown.

PLATE VI.

Fig. 8 shows the almost complete destruction of the lower end of the tibia and fracture of the fibula by a Prussian ball. A considerable amount of repair has taken place. Amputation was subsequently successfully performed.

Fig. 9 is a heliotype of the tibia and fibula removed by secondary amputation at the knee-joint. The particulars of the case No. LIII., are given on p. 134. The ball has simply grooved the lower extremity of the tibia, but in doing so it also caused a spiral fracture, a portion only of which is seen, to extend half-way up the bone.

PLATE VII.

Fig. 10 is taken from the left femur of a man on whom secondary amputation was performed. He was also one of the late arrivals, and it seems strange why amputation was not had recourse to in the first instance. Although gunshot wounds of all the joints, even the knee, may often be obscure, one would think the track of a ball which passed straight through the patella might readily have been traced. It was a Prussian bullet, which, after splitting off the internal condyle, lodged, as here represented, in the lower extremity of the femur. The patella is extensively comminuted.

Specimen 59, in the series of American photographs before alluded to, is an illustration of a somewhat similar description of injury, except that the patella was not fractured.

Fig. 11. The man who received this injury must have been kneeling at the time. A Bavarian bullet has grooved very deeply the anterior surface of the lower end of the femur, and after splitting off the external condyle, became impacted, as its velocity diminished, in the shaft of the bone where the more compact tissue commences. The bullet is a good deal altered in shape.

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