THE WAR IN SOUTH AFRICA.

THE MARCH FROM MODDER RIVER TO BLOEMFONTEIN.

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Bloemfontein, April, 1900.

A SHORT account of Lord Roberts's great march from Modder River to Bloemfonteln may be of interest to readers of the BRITISH MEDICAL JOURNAL, more especially as it illustrates the difficulties attending the treatment of the wounded under conditions different from those encountered during the earlier operations of this war.

Before this march began the various actions had taken place in close proximity to a railway line on which admirably-fitted hospital trains were at hand to carry off the wounded with comparatively little disturbance, and lodge them in well-appointed stationary hospitals within a short time. Indeed, in such places as Modder River the field hospitals were able to accommodate the more seriously wounded till such time as it was safe to move them—in fact, they more resembled stationary hospitals. Further, there was ample transport from the field of battle, and only a short distance for the wounded to travel; hence, they were rapidly collected and quickly lodged in tents, where they could remain till it was safe to send them to the base.

DIFFICULTIES OF TRANSPORT.

The conditions on this march were very different. In the first place, as a matter of military necessity, it was considered essential to cut down the number of ambulances with each division from the normal number of ten to two. The possibility that very serious difficulty and delay in collecting the wounded from the battlefields might result from this decision was repeatedly and emphatically pointed out to the military authorities by the medical department, but without avail. The justice of this warning was fully borne out at the battle of Driefontein. Not only was the number of the ambulances cut down, but all the other equipment, tents, etc., had also to be reduced, and as a result, many of the wounded, more especially at Paardeberg, had to bivouac under the shade of the trees, where available, or, failing them—and there are no trees in this country except along the river beds and around farmhouses—under temporary shelters made with blankets. This diminution of baggage affected all the arrangements: for example, it was often impossible to get boiled water, mainly because, owing to the small number of kettles carried, all were required for cooking. In part, however, this was due also to the difficulty of getting fuel and to the small amount of water obtainable. Such water as could be got was not only small in quantity but often extremely muddy so that the ordinary charcoal filter did not clear it properly, and very soon became so choked up that the water ran through very slowly; for the latter reason the Berkefeld and similar filters were of very little use.

In some of the field hospitals operations had to be done in the open, as the operating tent was required for the serious cases, and if a dust storm came on in the middle of the operation the conditions as regards asepsis were by no means ideal. At Paardeberg antiseptic dressings ran out at one of the hospitals, but I was able to tide over this difficulty, because, owing to the generosity of Lord Lister, I had with me some double cyanide powder with which we were able to impregnate sufficient material.

In this march, as has been said, we were away from a railway, the distance from the base increasing day by day. Yet the sick and wounded had to be sent back; they could not be left on the veld. It is a very different thing to transport wounded a short distance to a comfortable ambulance train, well supplied with every convenience, from putting them into buck or ox waggons, and sending them for two, three, or (in the case of Poplar Grove) four days' journey over the veld, with no roads, in springless carts, without suitable protection from the sun or rain, and without the comfort which a recently-wounded man requires. The agony which must be endured under such circumstances by many cases such as compound fractures, and the harm which may result to the patient, must be very great. In more than one case the result of the movement was to precipitate a fatal issue. Under the existing circumstances, however, no other course seemed possible. Military considerations prevented our carrying the wounded on with us (which, indeed, would have been almost as bad) and were equally against leaving them behind when we moved on. The ideal plan would have been to have sent back all those whom it was safe to move, and leave the serious cases behind at a field hospital at each stopping place with the necessary medical and other attendants. It was not, however, considered safe to do so at Paardeberg; there would have been difficulty in providing food and attendance, there was no house, and tents could not be spared. At Driefontein, on the other hand, though the communications with Kimberley had been closed, and there were no empty waggons available to take on the wounded, there was a house, and tents could also be spared, as no further fighting was expected until the army reached the neighbourhood of Bloemfontein. This impossibility of transporting the patients was a very fortunate thing for them. They were left behind with great advantage to their prospects of recovery.

FOOD, WATER, AND SICKNESS.

The amount of sickness in the force during the long and trying march was remarkably small; and probably in no other climate would so little harm have resulted. During the day the heat of the sun was scorching, and at first quite a number of men suffered more or less severely from heat stroke and exhaustion. On the other hand, in the early morning before dawn the cold was often great, while on several nights rain fell, and, of course, as no tents were carried, everybody got soaked, and did not get dry till the sun came up. For the first few days the thirst was terrible, and many who had campaigned in India said that the thirst here was much worse. All good resolutions about boiling or filtering water were thrown to the winds; water, no matter how muddy, had to be got as quickly as possible. For some time we were on half rations, and the fresh meat was often so tough as to be quite uneatable. On several occasions, where the marches were long, the convoys did not arrive till late or not at all, so that even the half rations were not obtainable. The man, therefore, who had not taken the precaution of carrying something in his saddle-bags had to go supperless to bed. "To bed" is rather a euphemistic expression, for when the baggage did not come in, "bed" simply meant lying down on the veld without covering of any kind. And yet, in spite of all this, after a few weakly members had been weeded out in the early period, the health of the troops was excellent.

The main trouble and one from which almost all the force has suffered at one time or another has been diarrhœa, or, as it has come to be more elegantly called "Modders" or "Riets," according to the river water which was being drunk, and according to the severity of the case, the former being considered more severe than the latter. In some cases it has been so severe as to necessitate the admission of the patients to the field hospitals, or even their return to the base. In the great majority of cases, however, the trouble has been slight and easily controlled, and was probably due either to salines dissolved in the water or to the irritating effect of the mud. Since our arrival in Bloemfontein enteric fever is making its appearance among the troops. The disease was probably contracted at Paardeberg; indeed, considering the state of the Modder River at that camp produced by the waste from Cronje's laager above, and the impossibility of preventing the troops using that water, it is surprising that the result was not much more serious.

FROM MODDER RIVER TO JACOBSDAL.

It may perhaps be of most interest to your readers if I give a short account of the march from February 12th, when Lord Roberts left Modder River, to March 13th, when he entered Bloemfontein, referring more especially to the points bearing on the treatment of the wounded.

On Friday, February 9th, while at Orange River, I received a telegram from Colonel Stevenson, R.A.M.C., Principal Medical Officer with Lord Roberts's force, asking me to join the headquarters' staff, which I accordingly did at Modder River on Sunday, February 11th. Next morning (February

12th) early we left Modder River by train for Enslin, and subsequently rode to Ramdam in Free State territory, a distance of about 12 miles. Thence we went next day (February 13th) to De Kiel's Drift, on the following day to Waterval Drift, on Thursday (February 15th) to Wegdraai, and on Friday to Jacobsdal. This completed the first part of the expedition, and during this time General French's division had preceded us and entered Kimberley, and General Kelly-Kenny's division had followed more slowly in his tracks. This was in most respects the most trying part of the march. The heat during the day was very great, and on the first and second days especially led to a considerable number of men falling out from fatigue and heat stroke, and some 60 had to be sent back. Beyond some scrub there was no vegetation, and the passage of large numbers of troops and the enormous lines of transport stirred up the dust, so that dust storms were frequent. Further, the convoy arrived very late, on the first day especially, and those unaccustomed to this sort of campaigning, and unprovided with food in their saddlebags, had to go without.

From a surgical point of view there was little of importance during this part of the march. On arriving at De Kiel's Drift on the Tuesday (February 13th) we found that General French had had a slight engagement on the previous evening, and that four wounded had been left behind. With the exception of a little bugler boy who was wounded in the foot—a perforating wound through the front part of the foot—while running up the river bank, as he said, to get a shot at the Boers, the cases were not serious. The next wounded with whom we had to deal were at Wegdraai on Thursday, February 15th. A small fight took place between there and Jacobsdal, in which a few were wounded, while some others were brought in from Waterval Drift. We had left that drift about 5 A.M. on Thursday morning, and, after the army had gone on, a considerable force of Boers attacked the rear part of the convoy, which had not yet moved on, and captured a considerable number of waggons. About 16 wounded were brought in and treated early on Friday morning, February 16th. With one or two exceptions, however, the wounds were comparatively slight, and the wounded were taken on to Jacobsdal in the afternoon and sent to Modder River.

THE GERMAN AMBULANCE.

At Jacobsdal we visited the German ambulance, meeting Drs. Kettner and Hildebrand, assistants of Professors Bruns and Esmarch. They very kindly showed us all their arrangements and cases, many of the latter being of considerable interest. Their hospital was established chiefly in the school buildings, and was very completely fitted out. A large proportion of the wounds were from shrapnel, and, as opposed to the experience on the English side, they told us that they had only met with a small proportion of bullet wounds. Consequently the skin wounds were frequently large, and in a considerable proportion suppuration was going on—indeed, had already begun when they were admitted. The experience of the surgeons to this ambulance in abdominal wounds was not very good, but on the whole they were inclined to leave them alone, in the first instance at any rate. They had not had a large number of wounded. After the battle of Magersfontein they had about 100.

PAARDEBERG.

We left Jacobsdal on the morning of Monday, February 19th, at 4 A.M., and rode through to Paardeberg, a distance of about twenty-seven miles, with a halt of two hours at Klip Kraal drift. On arriving there about 1 P.M. we found an action going on, chiefly artillery, and heard that a big fight had taken place on the previous day in which over 800 had been wounded. In the evening we took up our quarters on the banks of the Modder River, about three miles below Cronje's laager, and in the immediate neighbourhood of the two field hospitals of the Sixth Division, under Majors Pike and Ford respectively, one of the field hospitals of the Ninth Division under Major Murray, and the Australian field hospital under Major Fiaschi; the other field hospital of the Ninth Division, under Major Sawyer, was at a drift about a mile further down the river. During the previous day's fight the field hospitals had been shelled by the Boers without, however, anyone being hurt, but they had had to shift their quarters. As the result of the battle the Boers had retired higher up the river, the banks of which at this part were pretty high, but sloping, and lined with small trees (acacias, etc.). The hospital tents were pitched just above the banks of the river, where there were fortunately also some larger trees which gave shade to those patients who could not be accommodated in tents. We bivouacked halfway down the bank, and might have been picnicking on the banks of the Thames but for the occasional booming of big guns and the rattle of rifles.

BELOW CRONJE'S LAAGER.

The water of the Modder was, as its name (Mud River) implies, thick with mud and foul smelling from the dead animals and refuse from Cronje's laager. Water bottles containing it when opened frequently went off with a pop, and the gas which escaped was of a distinctly disagreeable odour. Hence, as far as possible, drinking water was brought in the water carts from a farm about five miles away. There was not enough of this drinking water, however, to spare for surgical purposes, so that the only supply available was from the river, while owing to the small number of kettles it was impossible to get a sufficient quantity boiled. The plain around the camp very soon became a sandy desert, so that the air was always full of dust, and dust storms were frequent. For some days the number of the wounded was so great that the operating tent in one of the field hospitals had to be utilised for the patients, and operations had to be undertaken in the open. Although the greater number of the patients were those wounded in the fight of February 18th, still a few came in every day, either as the result of small fights with those trying to relieve Cronje or as the result of sniping.

During our stay at Paardeberg the weather was fairly good, but on two nights there was much rain. On Saturday, February 24th, and during the night, it rained heavily, and the river rose considerably, with the result that during the whole of Sunday there was a constant procession down the stream of dead and putrid horses and other animals from the Boer camp. Several hundreds were counted, and as a rule as many as fifteen or twenty were to be seen at one time. The stench from these animals was very bad, especially if they happened to be temporarily arrested by branches of trees, and so on. Hence the greatest care had to be exercised in the sanitation of the camp, and it says a great deal for the arrangements adopted that no illness, except the ever-present "Modders," developed. It was, however, impossible to prevent the men drinking the river water: and that is, I believe, the source of the considerable number of cases of enteric fever which have developed since our arrival at Bloemfontein. Indeed, the state of the river was so bad that the removal of the camp had become a necessity when the brilliant attack of the Canadians during the early morning of February 27th fortunately brought Cronje's dogged resistance to an end.

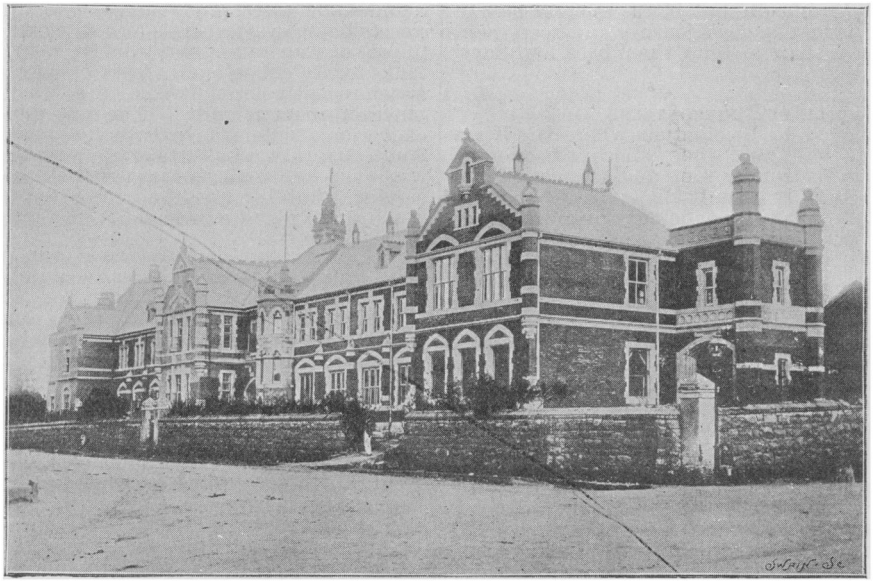
ABOVE CRONJE'S LAAGER.

Above the laager the conditions were very different. There the water was good, though muddy: the veld had not yet become trodden down, and the troops stationed there were in good condition. Since our arrival here the number of cases of enteric fever developing among these troops has been quite small. In company with Major Bond, R.A.M.C., I rode over on February 23rd to the part of the field hospital of the Seventh Division under Major Franklin, which was located on the banks of the river about two miles above the laager, and saw several interesting cases. The camp was very pleasantly situated on the banks of the river, and the wounded were doing well, and were, as indeed was the case in all the field hospitals, excellently looked after.

IN CRONJE'S LAAGER.

On the morning of Tuesday, February 27th, after Cronje had come in, Colonel Stevenson, Major Sylvester, R.A.M.C., his secretary, and I rode out to the Boer laager to see what assistance was necessary for the Boer wounded. The laager presented an appalling picture of devastation, and the stench was frightful. Dead animals in all stages of decomposition were lying about everywhere; a house close to the drift, in which a large number of horses had been stabled, had had its gable blown in, and was full of dead horses. The greater

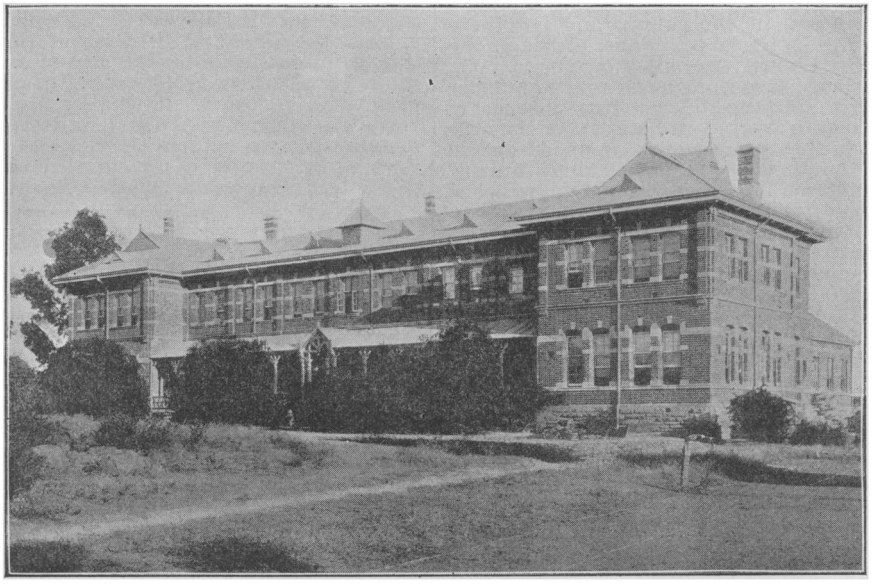
number of the waggons were in ruins, some overturned, some more or less completely burnt, while others were represented by a mass of broken wood and iron. The ground around was pitted and yellow from the lyddite shells, and strewn with fragments of shell, shrapnel, broken carts, and all sorts of *débris*. The laager was in most parts surrounded by trenches—or, rather, rifle pits—each holding one or two men, and completely sheltering them. The banks of the river were full of deep burrows in which the men had lain, and in which the wounded were found.



Grey College, Bloemfontein.

So well concealed were these burrows that it was only after repeated search that one could be sure that all the wounded had been found; their condition was lamentable in the extreme. Their doctors and ambulances had left them and gone into Jacobsdal when the flight from Magersfontein took place. The wounded had been lying in the foul laager without medical attendance or dressings of any kind, and as a consequence the wounds were very foul, and many of the patients were in a deplorable condition from sepsis. The septic state of the wounds is very well illustrated by the fact that next day, while we were again out at the place where the Boer wounded had been collected, secondary hæmorrhage occurred in two cases, and would have proved fatal had we not happened to be on the spot.

Cronje's resistance for so long a period may possibly indicate bravery, but his inhumanity in keeping his men for days in this death-trap, long after it was fully evident that escape was impossible, and in opposition to the wishes of the great majority of his followers, cannot be too strongly condemned. Suspecting the state of matters, Lord Roberts, several days before the surrender, offered to take over the wounded, and have them carefully attended to, and when Cronje refused that he offered to send in medical men to dress the wounds and attend to the patients. This offer was also refused by Cronje unless the medical men stayed with him altogether, a condition to which Lord Roberts naturally could not accede. Lord Roberts's humanity was also strikingly illustrated by the way in which he limited his offensive operations to what was necessary to keep up pressure, and convince Cronje of the hopelessness of his case, without destroying more lives than could possibly be avoided. Having collected the wounded, of which we counted 159 (a few more were subsequently discovered), and dressings having been applied by several members of the Royal Army Medical Corps who had come out, they were carried across the drift on stretchers, for the water was too deep for ambulance waggons to cross, and were deposited on the river bank in a nice shady spot about a quarter of a mile higher up the river. Two of the Boer doctors having in the meantime arrived from Jacobsdal, they were provided with dressings, food, and such covering as could be spared, and the wounded were handed over to their charge. I fear that there was not very much done for them, however, in the surgical way, for several cases—such as gangrene—requiring immediate operation were left alone. A few days later some of the patients were sent back to the German Hospital at Jacobsdal, and the majority to the hospitals at Kimberley.



Dame's Institute, Bloemfontein.

THE ACTION AT POPLAR GROVE.

We stayed in the camp at Paardeberg till March 1st. Then we moved on about five miles to Ossfontein, where there was a farmhouse, and where we remained for a few days to allow the horses to recruit, and to get up supplies. As transport became available, the sick and wounded were sent back to Modder River, and later to Kimberley, in detachments, so that it was not necessary to take any on to Ossfontein.

On the morning of March 8th we left Ossfontein. The Boers, who were in large force in the immediate vicinity, were attacked and after some hours completely driven back, with very little loss on our side. In fact, with the exception of

some of the mounted troops, who had about twenty men wounded at Poplar Grove, where the last stand of the Boers was made, there were no losses. The army bivouacked at Poplar Grove that evening, and most of the troops remained there till March 10th. Of the wounded 6 were serious cases: 1 head case (which I trephined), 2 compound fractures, and 3 abdominal cases. All but the 3 abdominal cases were sent back to Kimberley on March 9th, but it was thought best to take on the latter with us for one day's journey and keep them under observation rather than to send them back four days' journey to Kimberley.

THE BATTLE OF DRIEFONTEIN.

On March 10th we moved to Driefontein, where the Boers were again met with in force, and where another battle was fought which resulted in their utter rout and the clearing of the road to Bloemfontein. In this battle we had about 400 wounded, and it was here that the deficiency of ambulances became most evident. The greater number of the men were wounded on a ridge in front of the camp, and fell to the lot of the field hospitals of the Sixth Division, especially to Major Pike's. The action was not over till dark, and, though assistance was obtained from other bearer companies, the wounded were not all found and collected till well on in the night. Only 4 ambulances were available for carrying them to the field hospital, and as the distance was considerable and as each ambulance only takes 2 lying-down cases and 4 sitting up, it may be readily understood that a good many hours elapsed before all the wounded were got to the hospital. In fact, next morning about 11, when Lord Roberts was riding over the battlefield on his way to the next stopping place, he came on a group of wounded, who had been collected but had not yet been removed. As a consequence probably of this incident, he has ordered up the rest of the ambulances, and has issued an order in which he states that as under the system necessary on this march such delay was unavoidable, he desires that, should similar circumstances arise in future, help should be afforded to the R.A.M.C. in collecting and bringing in the wounded by fatigue parties sent by the officers commanding the regiments and corps to which the wounded belong.

As transport was not available to take these patients on with us, and as the communications with Kimberley were no longer kept open, it became necessary to leave the patients behind. The field hospital was therefore moved down to a farmhouse in the valley, and left there with supplies and medical attendance. Thus, although the patients had to be moved about two miles on March 11th, they were spared the long journey in buck and ambulance waggons till some days after the injury. This absence of transport was, I believe, a very fortunate thing for the patients. Wherever possible, the severely wounded should be left in the field hospitals for some days and not hurried back to the base. On March 16th, waggons were despatched to bring in the wounded to Bloemfontein (three days' journey), and at the same time Colonel Stevenson sent word to Major Pike telling him to use his discretion about sending on his patients, and advising him to keep back the serious cases. This advice was acted on, and they followed a week later. The further three days' march and entry of the army into Bloemfontein on March 13th has already no doubt been fully recorded in the newspapers, and I need not describe them.

THE WORK OF THE R.A.M.C.

In my next letter I shall make some remarks about the progress of the wounds, but before going any further I may here express my opinion that under the difficult circumstances which I have fully referred to, the work of the R.A.M.C. is deserving of the greatest praise. The task with which Colonel Stevenson had to cope of carrying out the medical arrangements of this large force (more especially the temporary accommodation and transport of the sick) with very insufficient materials, was done without a hitch, while each individual member of the R.A.M.C. strove not only to do his best for the sick and wounded, but also to add to the reputation for efficiency which the Corps has already deservedly won in this campaign. Attention is now being directed to the lessons taught on this march, and in the further course of the campaign an attempt will be made to overcome the difficulties as regards water for surgical purposes, dressings, etc., to which reference has already been made.

BLOEMFONTEIN.

Bloemfontein is a pretty town of about 6,000 inhabitants, lying in a hollow at the base of kopjes which rise highest on the north, while a plain stretches out from it for miles eastwards; the streets are wide, the houses one-storeyed, and surrounded by trees, and there is no drainage system, earth closets being everywhere adopted. The water supply consists in part of rain water, every house being provided with large tanks for its collection, in part of well water, and in part of water recently brought from the Modder River, from a distance of about 22 miles. The town is very healthy, with the exception of enteric fever, which seems to be endemic in most South African towns. Its origin here is difficult to trace. Of water the well water is that to which the disease is most often ascribed, but I cannot but think that the dust and flies have much to do with its persistence and spread.

IMPROVISED HOSPITALS.

Bloemfontein has a considerable number of public buildings, more especially schools; it is, indeed, the chief educational centre for the Free State. At the present time these schools, naturally enough, are empty, and they as well as some other public buildings, have been taken over for hospitals by Colonel Stevenson. In one week Colonel Stevenson and his Secretary (Major Sylvester) took over, fitted up, and fully equipped with medical and nursing staffs, buildings holding, in all, 510 beds. The buildings taken over, so far, are St. Michael's Home and Cottage Hospital, a large girls' boarding school carried on by Anglican Sisters; here 100 beds have been established, and the nursing is being done by the Sisters of the home, and by the R.A.M.C. orderlies. The Dame's Institute, another large boarding and day school for girls, has also been in part taken up and fitted with 150 beds. Grey College, the advanced school and college of the State, which was founded by Sir George Grey, provides 100 beds. The old Free State barracks have also been converted into a hospital, with 100 beds. The Convent furnishes 60 beds, and the industrial home—a school for boys—has 50 beds. All these institutions were in full working order and full of patients ten days after our arrival here, the patients being partly sick from the troops around and partly the wounded brought up from Driefontein. The work involved in doing all this will be readily appreciated by those acquainted with hospital organisation. Further accommodation has now been provided in the Raadszaal (Parliament House), which has been turned into a stationary hospital of 100 beds, and as soon as the railway is in working order No. 5 Stationary Field Hospital (with 510 beds), and the Portland, Irish, and Langman Hospitals will come up. In fact, it is probable that Bloemfontein will now become the hospital base instead of Capetown, as the weather at Capetown in winter is cold and wet, and not at all agreeable, while here it is dry and healthy.

MOVEMENTS OF BASE HOSPITALS.

FROM OUR SPECIAL CORRESPONDENT IN CAPETOWN.

April 4th, 1900.

HOSPITAL ARRANGEMENTS AT BLOEMFONTEIN.

ARRANGEMENTS are being rapidly made to constitute Bloemfontein an advanced medical base. No. 8 General left here last week by sea *viâ* East London; the Portland is under orders to follow. Four buildings have so far been taken over at Bloemfontein for hospital purposes: the Dame's Institute, the Grey College, St. Michael's Home, and the Industrial Institute. The Dame's Institute is the principal girls' high school of the Free State; and the Grey College, a similar institution for boys. Both are fine, well-built structures, with spacious dormitories and class rooms, and an abundance of smaller rooms. The latter, especially, might have been built for hospital purposes. The Dame's Institute is made up to about 150 beds, and the other three to about 100, but without any difficulty St. Michael's and the Grey College could each take another 50. Adjoining St. Michael's, which is a Church of England institution, partly a girls' school and partly a home for waifs and strays, carried on by the All Saints' Sisters, is the Bloemfontein Cottage Hospital, also under the management of the Sisters. This was, until a few

years ago, the only hospital in Bloemfontein. It is now being used for officers. It has about a dozen beds. The magnificent Raad Zaal, or Parliament House, is also being taken over for hospital purposes, but is not yet equipped. Besides these buildings, the large and very well fitted Volks Hospital is being utilised, and there are several field hospitals under canvas. It is evident that there need be no lack of suitable accommodation at Bloemfontein. Supplies are a little short still, owing to the insuperable difficulty of getting things up in sufficient quantity by railways, crippled with broken bridges and overweighted with work, but the military medical authorities are doing their level best to overcome difficulties. Colonel Stevenson, who is now Principal Medical Officer of Lord Roberts's force, is on the spot, and directing all arrangements, assisted by Major Sylvester, who has been withdrawn from Wynberg to return to his old post as Colonel Stevenson's secretary. Two more capable organisers hardly exist in the army. Nursing sisters of No. 9 have already gone to Bloemfontein, and the whole hospital is to follow.

An advance Medical Stores Depôt has been established at Bloemfontein, under Captain Connor, R.A.M.C., and the Red Cross Society is following up the troops most energetically. Lady Edward Cecil and Lady Charles Bentinck have just gone up to Bloemfontein in order to personally supervise the supply of comforts, and with a view to meeting the altered conditions of the campaign, which will henceforth be carried on very much apart from the railways; they have taken up two Red Cross waggons, which will be used to carry comforts to the isolated field hospitals.

ENTERIC FEVER.

Enteric fever is frightfully prevalent everywhere. No. 6 at Nauuwpoort is almost a typhoid hospital, and the same is to be said of the station hospitals. At No. 1 about two-thirds of the medical cases are of this disease, at No. 5 fully half, and the proportions elsewhere are somewhat similar. At Kimberley the hospitals are almost enteric wards; and yet, curiously enough, there is still a comparative absence of dysentery. There have been only a moderate number even in the field hospitals, and at the base very few indeed, the latter fact proving that even the cases at the front must be of a mild character or they would have found their way down here, as dysentery cases form a class which are invariably cleared out of field hospitals whenever they assume a chronic character. Most of the cases have done remarkably well, and the majority have gone back to duty in a few weeks.

SICKNESS AT KIMBERLEY.

The Canadian Red Cross Society has the direction of affairs at Kimberley, where there are four hospitals, accommodating a thousand patients, and nearly full. Enteric fever is again the staple there, and the results are appallingly bad, probably owing to the utterly broken-down condition of the men who have had to face the disease after a course of starvation during the siege. The Cape Police are suffering very severely. One enteric ward in the Kimberley Hospital (civil) is almost entirely occupied by them, and I am informed that for a week or two they had about one death a day out of some 40 beds. Another factor accountable for the bad results is the difficulty of obtaining sufficient fresh milk. Nobody can help this. Milk cannot be got; but its absence is sorely detrimental to enterics. At Bloemfontein a fair supply of milk was obtained locally almost at once. The farmers there had of course not been harried as was the case at Kimberley. Too much praise cannot be given to the medical authorities for the rapid way in which they are getting things into shape at both these places.

THE IRISH FIELD HOSPITAL WORK.

By Sir WILLIAM THOMSON,
Surgeon-in-Chief, Irish Hospital, Field Force, South Africa.

Naauwpoort, April 2nd.

THE PRIESKA EXPEDITION.

I MENTIONED in a former letter that in obedience to a telegram from Lord Kitchener I despatched a section of the Field Hospital to De Aar on March 11th, under the command of Dr. George Stoker. With him were Dr. Friel, with Dr. Counihan and Mr. MacIlwaine as dressers, a ward master, 18 orderlies, with 10 Cape boys, the equipment consisting of 6 waggons, 2 Scotch carts, 1 water cart, 66 mules, and 4 ponies. Dr. Stoker reports to me that they arrived at De Aar on March 12th at 1 A.M. The column which they were to accompany consisted of 2,000 men. The hospital started on March 15th. The first march was to Britstown, thirty-one miles. At 5 o'clock on March 16th they were ordered to push on, being the only field hospital available, and they reached Upwater at 2 A.M. on St. Patrick's Day. Here there were many casualties and sick to deal with. Ten bad cases were sent back to a stationary hospital at Britstown under charge of Mr. MacIlwaine and Wardmaster Hamilton. A small hospital was established at Upwater in a farmhouse, and 19 cases were left there under charge of Dr. Counihan. The hospital continued its course through Dornbergsfontein and Karabeek, attending to the sick and injured there, and on March 21st Prieska was reached. On the way Dr. Friel and the Hon. Rupert Guinness went out some miles with a stretcher and Cape cart, and brought back an injured man safely.

On the return journey Dr. Stoker was appointed S.M.O., with instructions to evacuate all the sick and injured from various places. De Aar was reached on March 27th. The work was most arduous. The rain fell in torrents for three consecutive days, as well as at intervals, and clothing and bedding were drenched. The staff never slept in a tent. The entire march was 238 miles. The number of cases under treatment was 202, and 56 were transported by wagons. Dr. Stoker states that the commissariat department was beyond praise.

In a report on the medical aspects of the expedition Dr. Friel says the water was bad. It was filtered or boiled, and tea was the safest drink. What struck him as one of the trying conditions for the soldiers was that they had to start on a hard day's work with an insufficient breakfast. The hospital staff rose early, and had a warm meal before starting, and to this he attributes the fact that they all came through the work in excellent health. There were all degrees of diarrhœa as regards the severity of the accompanying pain, the frequency of the motions, and the passage of blood or not. Some of the dysenteric cases were in a most pitiable condition from exhaustion and want of sleep. Lead and opium were most frequently given, and acted well in many cases. There was no death. Patients when first seen were given boiled milk and bovril, preferably the former. Cases treated thus in the early stages rapidly improved and returned to duty. The patients from the regular army were not nearly so numerous as from the Yeomanry and other volunteer corps. Some cases of typhoid and of fractured skull were placed in hospital at De Aar. He cannot point to any single circumstance as a cause of the diarrhœa. It seemed to be caused by a combination of overwork, exposure to the sun, chills from sleeping in wet clothes, unsuitable food, and impure water. He recommends the early treatment of these cases to consist of condensed milk and bovril, with some selected medicine.

The work done by the hospital was excellent under the most trying circumstances, and I am glad to be able to send you a copy of the following letter which I have received from Lord Kitchener:

De Aar, March 27th, 1900.

Dear Sir William,—I am sure you will be glad to hear that the Irish ambulances did most excellent work with the column that marched to Prieska and back. They proved themselves thoroughly efficient in every way, and though we had more cases than I anticipated owing to very wet weather, they showed themselves quite equal to the occasion. I have been most pleased at the willing way in which all hands worked the whole time under Dr. Stoker.—Yours sincerely,

KITCHENER.

FIRING ON HOSPITALS.

Before I left home I had read on many occasions of the firing on hospitals in camp or on the field by the Boers. These reports gave rise to natural indignation as a piece of wanton savagery. I have no means of knowing, of course, how far these actions were deliberate. But since I have been here I have come to understand how a hospital may be shelled by an enemy in utter ignorance of what it really is. The truth is that under certain circumstances the Geneva Red Cross is useless as a protection. This morning was hot and still. There was hardly a sign of motion in the air. I said to a distinguished officer, "If this camp were attacked by the

enemy now how could they identify your hospital?" "Oh," he said, "we have our Red Cross flags up." I asked, "Where?" He answered, "There, and there, and there." "Oh, yes," I said, "they are up, but who could see them at a thousand yards off?" And I pointed out that the flags were lying motionless along the flagstaff in folds. Now days like this are not uncommon in South Africa, at all events, and I therefore understand how an enemy could send shell after shell into a hospital camp under the belief that he was attacking a combatant portion of the army. The Red Cross is not made a sufficiently distinctive feature. On the waggons it is quite too small, and it is not recognisable at a comparatively short distance.

I suggest that every marquee and bell tent used for hospital purposes should have a very large Red Cross on the roof and sides, repeated on various aspects, and made as obvious as possible. At present the enemy only sees a group of tents which are precisely like those used by the fighting men, and if the wind is not sufficient to extend the flag there is nothing to tell him that he is firing on a crowd of sick and wounded men. In every case there ought to be a light canvas in a wire frame bearing a large Red Cross, which could be hoisted instead of the flag when that is useless. There would be no difficulty about this. It would enable a hospital to have the protection which it has not at present, and we should hear less of outrages against the Geneva Convention. The Red Cross is on easy chairs and buckets and boxes of dressings, but it is not exhibited as it ought to be in all places where it is most required. I have tested my opinion as to the uselessness of the flag as a sign in calm weather. I am able to declare that although I knew the exact place to look for the flagposts, the flags themselves were absolutely indistinguishable at 200 yards. I could see the thickening at the top of the poles formed by the limp folds of the flags, but nothing more. There was no Red Cross visible from end to end of the camp, although the flags were duly hoisted. But nowadays rifle fire is effective at more than 2,000 yards, and when we come to big guns we are dealing with ranges counting miles. Even a careful search with a telescope would not, in the absence of wind, enable anyone to identify the hospital. The dimensions of the Red Cross badge were decided on years ago, before the days of the small-bore rifle. They are quite inadequate now. I have called attention to this matter because I have seen the system at work and have noted its defects. A prompt remedy is needed on the lines which I have suggested, for the matter is of the first importance to every civilised nation concerned in the operations of war.

SURGICAL NOTES FROM THE MILITARY HOSPITALS IN SOUTH AFRICA.

[FROM OUR SPECIAL WAR CORRESPONDENT.]

Capetown, March 20th, 1900.

SECOND THOUGHTS—(*Continued*).

So many of the wounded who are either convalescent or rendered unfit for active service have now been sent home that the sight of wounds from Mauser bullets must be almost as familiar at home as it is out here. Among the cases invalided are not a few likely to need further treatment, in some instances in the form of operation. The occasion, therefore, may be appropriate for reviewing the surgical experience of the past few months with regard to the treatment of the various classes of injuries.

ABDOMINAL INJURIES.

In previous letters little mention has been made of the operative treatment of abdominal injuries. It seemed wiser to wait until a fair amount of evidence had been collected, and until the opinions of the bulk of those who could furnish information of value could be got together. Many hoped, at the outset of the war, that the opportunity had at last arisen for showing that abdominal surgery could extend its sphere of usefulness into a new and hitherto almost unexplored field. Great hopes were built on the experience of the last twenty years' work in this branch of surgery, and not a few probably looked forward with more interest to the results of the operative treatment of abdominal injuries than to any other department of surgery in the field. Intestinal surgery has of late made such advances, and so much attention is paid to it by all operating surgeons that it did not appear too sanguine to imagine that a perfect revolution was likely to be effected in the treatment of this formidable class of cases.

Possibly some such revolution has really come about, though hardly in the way or in the direction that was anticipated. I do not think I am exaggerating in the least—and I fancy opinion is in reality tolerably unanimous in the matter—when I say that the results actually obtained up to the present are, in a sense, of the most disappointing nature. It is true that the proportion of patients who have recovered from penetrating gunshot wounds of the abdomen is much larger than in any previous campaign. That much may be safely asserted, although statistics with regard to the present campaign are not yet available, and works of reference relating to military surgery in the past are not readily accessible here; but these fortunate patients have not been saved by operation. So few indeed have recovered after laparotomy, and so many with obviously grave abdominal injuries have recovered without being submitted to any operation at all, that it is at least questionable whether the better practice is not to leave this class of injuries alone altogether as far as operation is concerned.

We hear much, and probably shall continue to hear much, of the occasional cases that have recovered after suture of perforations or excision of lengths of intestine. But these rare successes must not blind us to the absolute facts. The percentage of mortality after laparotomy for gunshot wounds of the abdomen will certainly, when the figures come to be published, be shown to be appallingly large. The percentage of recoveries when the patients have been left untouched will be strikingly great when compared with previous records. Were it not for the latter fact we should, of course, be disposed to think that with further experience and by so modifying procedure as to meet more effectively the special conditions, better results might be obtained. Possibly this is true, but it would still be a question whether laparotomy, save in the most exceptional instances, is good practice or even justifiable surgery.

One of the German surgeons sent out to study gunshot wounds in this way is said to have remarked that abdominal surgery in war was pure "phantasy." Others had previously, and more have since, come to much the same conclusion.

THE TIME FACTORS.

Several points must be borne in mind in this connection. One is that, in the cases operated on, the laparotomy has, for the most part, been performed under the most unfavourable conditions. Time is a factor of the first importance. The patient may have been lying out for some hours before being picked up by the stretcher-bearers. A further delay follows before he is brought into the field hospital. If an isolated case, he might be there attended to immediately, but it is almost certain that under the only conditions in which a field hospital is likely to be near at hand an engagement is going on, and he finds himself one of many who require treatment. The work in the field hospitals is got through swiftly enough, but it is obvious that many patients must, justly, take precedence of a case requiring an operation of a very protracted nature and for which somewhat extensive preparations have to be made. Cases, for example, of hæmorrhage or fracture must be attended to first, for it is of prime importance to clear the field hospital as rapidly as possible. Hours may elapse, therefore, when the patient is actually in the field hospital before his turn comes, and these are hours of hard work for the surgeons and for the orderlies. At the end of this time, when the inrush of wounded is over for the day, the most indefatigable surgeon would hardly feel that he was justified in commencing an operation that may last an hour or more, even if he considers that, with the means and assistance at hand, he is justified in undertaking it at all. The condition of the patient may possibly settle the question, and the surgeon has to choose between operating on a patient suffering more or less profoundly from shock or allowing the precious hours to slip away if operation is likely to be of real benefit. For the most part then the question is settled in one way, and the patient is transferred back to the nearest suitable stationary or base hospital. Usually from forty-eight to seventy-two hours have elapsed after the reception of the wound before the laparotomy can be performed. It is obvious, of course, that under the best

imaginable conditions, the surroundings and the provisions for asepsis must be less complete and perfect in a field than in a base or stationary hospital. The latter, in the present campaign, is, as I have repeatedly urged, much less of a disadvantage than might be supposed. The onlooker, with his critical faculties completely in abeyance, who is familiar with surgical work in London or in large cities, will not be profoundly impressed with the standard of asepsis aimed at or the precautions thought necessary to reach that standard by either the nurses or orderlies working in the military hospitals. The surgeon whose lines are cast in places where the climatic conditions and the pure air do not do so much for him as in South Africa, and who has learnt by sad experience how much depends on the most rigid observance, by everyone concerned in an operation or dressing, of details calculated to secure asepsis, would probably be horrorstruck at much of what he would see done by orderlies and nurses (for the most part) in their surgical work. It is worse than idle to point to results and to assert, as can be asserted with truth, that there has been no case of pyæmia, erysipelas, tetanus, "hospital" gangrene, or the like. The next war in which England is engaged may not be fought in South Africa or in the Soudan. But the same assistants may be called upon to do the same work. Amidst unfavourable surroundings, unless far more stringent precautions are taken than are as a rule observed in the military hospitals in South Africa their deficiencies will be found out, and these grim enemies of the surgeon will once again, as in times past, work havoc. The nurse and the orderly are links in the antiseptic chain. Unless they are as rigidly careful as anyone else concerned, as the operator and his immediate assistants, the continuity is interrupted, and the patient suffers.

It must not be supposed that I am arguing that for abdominal cases special antiseptic precautions are necessary. As a matter of fact this does not seem to be the case, and anyhow there should be no sort of distinction. The most perfect attainable asepsis should be secured in every case whether abdominal or not, and whether the injury is severe or trifling.

Bullet Wounds of Liver, Spleen, and Kidney.

But even if a special hospital were provided in the field with every sort of provision for the most effective and early treatment of patients with abdominal wounds it is more than doubtful whether laparotomy would often be necessary or even advisable in the case of penetrating wounds due to small-bore bullets. The extent of injury to the viscera from which a patient can recover is still quite uncertain when only palliative treatment is adopted; and again, the extent of injury is largely a matter of conjecture.

It is quite certain that a small-bore bullet may penetrate the whole thickness of the liver, from side to side or from before backwards, without setting up fatal mischief, sometimes even without giving rise to symptoms of any moment. Even if large blood vessels are partially divided in the liver the hæmorrhage need not be serious. A very small laceration of this viscus is likely to prove a more serious injury than the most extensive perforation, and small-bore bullets do not lacerate. There are cases enough that have come under treatment where the wound of the liver has been complicated with that of other viscera—the lung, kidney, or intestines, for example—and where the patient has made a good recovery. Anatomical considerations make the diagnosis of wound of the liver certain in most cases. Sometimes there are practically no after-effects at all, sometimes hæmatemesis occurs. Unless there were evidence of extensive effusion of blood taking place into the peritoneal cavity, there is no indication for laparotomy, and not even the most enthusiastic young surgeon joyfully finding himself emancipated from control, or even the most ardent "specialist" would dream of advocating operation.

Probably the same remarks apply to the spleen, though in this case the diagnosis must be as a rule conjectural. The abdomen might be opened in these cases and some blood sponged out, or something might be sutured, and the patient might recover, but no one would doubt that if such a surgical misdemeanour were perpetrated the recovery would be *post* and not *propter*.

Bullet Wounds of Stomach and Small Intestines.

Anatomical considerations do not, however, guide the surgeon clearly to a precise diagnosis when the intestinal area is involved. It is even uncertain whether the stomach, in many instances of apparent wound of that viscus, is really injured. In the case of the commencement or termination of the large intestine, tolerable certainty can be felt as to whether it is wounded or not, and a fairly accurate idea can be gathered, judging by the direction of the wound, as to whether perforation is single or multiple.

But when the area of the small intestine is invaded it is profoundly uncertain whether there are few or many perforations, and whether blood vessels of any size are damaged in the mesentery. The small intestine may almost entirely escape when it seems incredible, judging by the wounds of exit and entrance, that anything short of the most extensive injury should have been inflicted; and on the other hand the number of perforations may be so large from a penetrating abdominal wound of no great length that the arrangement of the intestines as the bullet passed through them is quite inexplicable, however oblique the wound. Thus a case is reported in which no fewer than thirty-six different perforations were discovered. On the other hand, the bullet may take so fortunate a direction that only some four or six holes may be made, and these may lie all close together and involve but a small length of the gut. It is impossible to predict the condition likely to be found on opening the belly. The degree of shock affords no criterion. Abdominal exploration is therefore at best a very experimental proceeding, and the uncertainty as to the actual extent of the injury must necessarily involve much searching among the viscera.

These unfavourable features entail other grave drawbacks to operation. First, that the operation is likely—indeed almost certain—to be protracted; and, secondly, that much exposure and chilling of the viscera is sure to take place. Now, surely, the great factors for success in abdominal surgery are that the contents of the abdomen are not unduly exposed, are kept warm, and that the operation is conducted with all possible rapidity. It is hardly possible to approach too closely the limit that divides speed from haste. These all-important conditions cannot, from the very nature of the case, be observed.

The most favourable condition for the stomach or intestines to be in when the bullet passes through them would seem to be one of emptiness and collapse. Under these conditions a small-bore bullet may probably pass through, often making little more than a slit, and the perforation is practically valvular from the first. Presumably, if the edge of the collapsed intestine is struck a piece is cut out and leakage is likely to take place into the peritoneal cavity. The same seems to be true of stomach wounds, though in this instance one would imagine that the opening is even more likely to close spontaneously, without permitting escape of contents, than in the case of the intestine. Lymph is very rapidly effused, and it is very likely that in the course of an hour or two the fate of the patient is decided. If even a small amount of the contents of the intestine escapes before the wound is sealed by natural means, the issue is likely to be fatal, and the progress of the case is not likely to be diverted into a more favourable course by abdominal section. And if no extravasation of the contents of the hollow viscera of the abdomen has occurred no real good will come of exploration, while much harm may ensue. Not only will an operation have been done that was really needless, but the natural process of cure may be gravely interfered with.

Exploratory operation is probably more justifiable when there is good reason to suppose that the stomach is wounded than when the alimentary tract lower down is the seat of injury. But here experience of civil surgery shows that the element of time, though a consideration of the first moment, is a less cardinal factor than when the intestine is involved. In cases of perforating gastric ulcer, for instance, the prognosis, while grave if more than twenty-four hours have elapsed, is by no means hopeless (with operation) if the patient is not seen till much later. But the mere mention of a disease such as gastric ulcer compels me to emphasise the essential, the vital, difference as regards treatment between the perforation due to a destructive exsanguine breaking down and that

caused by traumatism, such as the perforation of a bullet in a healthy, vigorous man.

Wounds of Large Intestine.

Many cases have been met with in which the large intestine has presumably or almost certainly been wounded, and it appears to be pretty well agreed that these cases are best left alone so long as no untoward symptoms arise. The following is a fairly typical example, as regards its progress, of a wound that involved the large intestine, possibly even perforating it:

A private was shot at a range of 800 or 900 yards. The bullet entered just below the crest of the ilium, just on the outer edge of the left erector spinæ. The ilium was pierced (this bone usually is drilled by small-bore bullets without any great breaking up) and the bullet, which preserved the usual direct course throughout, passed out beneath the pubic arch and ran down the inner side of the right thigh, lodging finally at the back of the femur close to the adductor tubercle, in which situation it was detected by the Roentgen rays and subsequently extracted. The bladder was injured, and for five days the man had hæmaturia. The chief interest of the case, however, lay in the intestinal injury. For some ten days there was marked distension over the course of the descending colon. Over the abdomen generally there was pain and tenderness and some general distension.

The symptoms were so far marked and the condition appeared so grave that many surgeons familiar only with civil practice would not have hesitated to explore. Had this been done, and had the patient not succumbed, the successful result would have been attributed to the operation and it would have constituted another (probably published) triumph for abdominal surgery. However, nothing in the way of operation was perpetrated. The symptoms gradually, as in many other cases that I have seen before and since, subsided and recovery followed. There was a slight degree of cystitis present when he was discharged from hospital.

Wounds of the Bladder.

Wounds of the bladder are not very frequent, and are liable to be extensive and lacerated, for while the ilium is usually drilled, the rami of the pubes and ischium tend to break up extensively. In a few instances recovery has taken place after a urinary fistula has formed, the water being discharged direct from the bladder into the perineum or groin, but the prognosis is generally unfavourable, and these patients are always anxious cases.

Nursing in Abdominal Cases.

It is in injuries of this nature that the weakness of the nursing makes itself felt. Every patient requires a special nurse. The nursing sisters do not attend to such cases—more's the pity!—and thus the patients are looked after by the orderlies. However hard these men work (and in many instances they work with the utmost industry and intelligence) they seem incapable of bestowing the same patient, unremitting, watchful care on a distressing and ungrateful case that a nurse (if worthy of the name) always has it in her power to give. Very slight influences will tip the balance one way or the other, and really good nursing may in cases of the kind absolutely determine the issue. There is not much of romance about a patient with a urinary or a fæcal fistula, or a case of fractured spine with paralysis of the sphincters. Most women can effectively sit by the bedside of a patient, fan away the flies, and put eau-de-cologne on the forehead, persisting in these simple duties with a quiet patience that appeals very directly to the sympathies of those who do not understand what nursing really is or can be. But the hardworking, practical, conscientious woman, who keeps one of these distressing cases always dry, who can ward off bedsores, and who, in short, does a world of invaluable work that does not show, and does not appeal to anyone save the medical officer, gets little credit for what is real nursing.

Diagnosis and Prognosis.

It is not of course possible in many cases of probable injury or perforation of the large intestine to assert what the lesion actually is, or indeed sometimes, even though the abdominal symptoms are strongly marked, whether there is any real lesion of the gut. The best rule of practice, however, appears to be to wait on events. It will seldom happen that any more formidable operation will be called for than the opening of an abscess in the later stages.

Gunshot wounds of the small intestine still remain very formidable injuries. Some, indeed, doubt whether recovery can take place, and are inclined to urge therefore that, however great the mortality after operation, however unfavourable the condition of the patient and his surroundings, abdominal exploration gives the only, though admittedly a very faint, chance. Opinions appear to differ. I may be allowed, meanwhile, to express the most emphatic opinion against laparotomy in these cases as a routine measure to be adopted whenever the circumstances appear to justify its performance at all. The routine practice should be to avoid operation, and the instances where it might be proper to operate will, I believe, be found to occur so rarely that they may here be neglected.

It will of course have been understood that in all the foregoing remarks on penetrating abdominal wounds I have been referring to what may be called primary laparotomy. Various operative proceedings, including abdominal section, may obviously be needful during the progress of the case.

Grave doubts have been expressed, and by competent judges, as to the possibility of recovery after penetrating wounds of the small intestine even with the normal Mauser or Lee-Metford bullet. No doubt the injury is one of the very gravest kind, and probably in the vast majority of cases fatal. There seems, however, no reasonable ground for doubting that recovery does occasionally take place by natural means. Thus a man received a wound from a Mauser bullet which entered close to the umbilicus and passed out through the liver. It was almost impossible to conceive how in this case the small intestine could have escaped injury, and such injury necessarily implies perforation. The immediate after-symptoms were grave. Much distension, as usually happens, occurred and for days life hung in the balance. Convalescence was interrupted some three weeks after the injury by a severe attack of abdominal pain associated with vomiting that persisted for some twelve hours. But this formidable attack subsided without serious consequences, and convalescence once re-established promised to proceed to complete recovery.

In another patient the bullet entered close to the posterior superior spine of the ilium on the right side and made its exit between 3 and 4 inches to the left side of the umbilicus and level with it. Here again, owing to the oblique direction of the wound, the small intestine can scarcely have escaped injury. The man had been long without food and the intestine throughout was presumably collapsed when wounded. Distension soon followed and increased for two days, but then subsided. There was no vomiting in this case. Recovery was rapid and permanent.

In no case where the intestine has been wounded is it safe to predict recovery under three or four weeks. A painfully dramatic case that occurred in the early part of the campaign exemplifies the wisdom of withholding any positive prognosis for a long time.

A man had been shot through the abdomen. The immediately grave symptoms had passed away, and everything seemed to be progressing favourably. Indeed the case occupied a sort of post of honour in the ward as one of sensational recovery. Some two or three weeks after the wound was received (I speak from memory only as to dates) the patient raised himself suddenly in bed, exclaiming, "Why, I am going to die, after all." The verdict was true. Distension of the abdomen began and increased with startling rapidity, and the man sank and died in a few hours. Probably in this case a gangrenous patch of bruised gut gave way suddenly, or there was hæmorrhage from a large vessel.

Need for Pathological Investigation.

It must be admitted that, up to the present, the *post-mortem* records of these and other classes of cases of great pathological and surgical interest and value are rather meagre. There is no pathologist provided for general hospitals by the regulations, and the medical officers have to look after this all-important department themselves. In this connection it may be remarked that the instruments supplied for making *post-mortem* examinations were neither numerous nor adequate for the work. The boxes were hardly fitted up in the most modern or convenient way. The difficulties were in consequence much increased. In a hot climate it is no very light or pleaaant task to make a systematic necropsy, and in times of pressure of hospital work the duty is apt to be neglected when the performance of the examination depends solely on the energy and interest in work of the medical officer. Moreover, it is far from being desirable, or even proper, that a medical officer in charge of surgical patients, and who may at any time be called upon to perform operations, should conduct *post-mortem* examinations at all. At the same time I desire here most gratefully to acknowledge

the kindness and zeal of some of the civil surgeons who in various hospitals have performed necropsies at my instance, and primarily, for my benefit. It is devoutly to be hoped that the fullest records, published in an accessible form and not too long delayed, will be in due course forthcoming as to all abdominal cases. There is an opportunity of ascertaining from perfectly reliable statistics what is the best treatment for these serious cases and of knowing positively what (so far as figures can prove the point) the real value of laparotomy is for penetrating wounds of the abdomen. In civil work it is almost hopeless to expect that we shall hear of all the failures, while the successes are made to loom large in print. For it is the successes that we want others to bear in mind, though it may be that the failures are what we bear most in mind ourselves.

FACTORS IN PROGNOSIS.

The conditions of surgery in the field are very different at all times from those of civil practice, and in no class of cases perhaps is the distinction more marked than in the category under consideration. Penetrating wounds of the abdomen, however, are of such rare occurrence in civil practice that the information derived from so large a number of cases cannot fail to be of the greatest value, and may possibly largely modify the views at present held.

The fact is that penetrating abdominal wounds caused by small-bore bullets are novelties to all surgeons. Experience has to be built up by each one. The "abdominal specialist" has not the slightest advantage over anyone else. Indeed, he is at a distinct disadvantage with the hospital surgeon, who is probably far more familiar with cases of injury. Experience of previous campaigns, too, counts for little. If we want to seek for parallel cases to the remarkable recoveries which have of late excited so much attention, to recoveries after penetrating wounds of the abdominal or of the thoracic cavity, we must go back not to the last—or, for fear of starting again a question that is as tiresome as it is interminable, let me say the nineteenth century—but to the days of duelling with the small sword, or to the times when Ambroise Paré was the leading authority on military surgery. It is wholesome, though it may be a little surprising or even humiliating, to find that these miraculous recoveries were not wholly unknown in pre-antiseptic and pre-anæsthetic times, and when the more elaborate surgical operations were not even contemplated in the field. Pending the publication of full reports, which will include, it is to be hoped, detailed records of all operations performed, we can but summarise the experience gained. At the same time, I have little fear that with more elaborate returns of abdominal wounds the general views that have been expressed above with regard to their operative treatment will be upset.

A few cases of appendicitis came under treatment, and some cases of abscess of the liver, following old dysentery.

ENTERIC FEVER AND PERFORATION.

I did not hear of any instance in which it was thought proper to open the abdomen in order to deal with perforation of the intestine from typhoid ulceration. The type of enteric fever was a bad one, and the operation—of questionable value in most cases—could hardly have been seriously entertained.

CLINTON T. DENT.

THE PRINCESS CHRISTIAN HOSPITAL TRAIN IN NATAL.

By GEORGE ASHTON, M.B.Vict.,
Civil Surgeon to the Hospital Ship *Nubia*.

Durban, Natal, March 23rd.

THE original intention was to appropriate this train for the Cape lines, and it was landed in Capetown in the belief that it would be used between the northern divisional field hospital camps and the large base hospital at Wynberg. Lord Roberts, however, apparently considered that the two improvised hospital trains on the Natal Government Railway needed supplementing in view of the seriousness of the engagements of General Buller in the relief of Ladysmith, and accordingly ordered the Red Cross train on to Durban. Unavoidable delay occurred in the reshipment of the numerous heavy packages at Capetown; and, owing to the crowded harbour here, there was some delay in landing the packages, consisting of sections of the train packed in large crates. All the available mechanical men on the staff at the locomotive workshops were put upon the construction of the train, that is, the sections ready to be fitted together as they arrived from England; and so great was the expedition and the energy shown in the work that the complete train was hauled out on March 16th, just three days after the receipt of the last cases. Next evening the train left for the front, and has already brought down several loads of sick and wounded men. This was the earliest opportunity that could be taken, as the trestle bridge over the Tugela was only then completed. Amongst those who were present at the trial trip were Sir John Furley (Chief Commissioner of the British Red Cross Society in South Africa), Colonel Forester, Mr. Frederick Treves, and many doctors from the various hospital ships in port. The engine was most gaily decorated with evergreen, the Irish flag flying alongside the Union Jack in honour of St. Patrick's Day and the Queen's gift of shamrock to her soldiers, and also bore on the front a large portrait of Her Majesty, whose practical interest in the train embraced the presentation of its blankets. It was intended at first to have a train of ten carriages, but it was found that one of seven would be more suitable, considering the narrow gauge and steep gradients of the South African railways.

The carriages are spacious; they run on bogies, and are fitted throughout with the vacuum brake. Each carriage is 36 feet long, 8 feet wide, and 8 feet high. There is excellent ventilation provided in the roof. The doors are wide, and broad portable steps are provided, thus affording easy access from the ground at places where there are no platforms. The train is made up in the following order:

No. 1 contains three compartments. The first is fitted all round with cupboards for linen, etc., the whole of the extreme end being occupied by a large chest for soiled linen, lined with zinc, and ventilated from outside, the zinc lining and the constant passage of air throughout preventing any offensive effluvia from entering the carriage. The next contains beds for two invalid officers. These beds are lounges and lockers by day, and at night are converted into beds. The next compartment has a similar arrangement for the two lady nurses, with the addition of curtain which can be drawn in front of each.

No. 2 car is also divided into three compartments, and may be called the doctors' quarters. The first is for two medical officers, and the fittings are similar to No. 1. Next to this is the officers' dining room, where half a dozen people can enjoy themselves confortably. The next compartment is the surgery. Along one side runs a wide bench, to be used for dispensing, fitted underneath with drawers. Occupying about one-half of the opposite side are shelves and racks contrived to hold bottles and glasses, etc., without any danger of their being upset by the movement of the train. Sufficient space is left for an operating table.

Nos. 3, 4, 5, and 6 are the hospital wards, and are all fitted alike. Each carriage contains 22 beds—18 for invalids and 4 for attendants—ranged on either side in three tiers, with a passage 2 feet 6 inches down the middle of the carriage. The bed consists of a light iron frame, with a netting of wire across, on which is placed a hair mattress, tightly sewn down in transverse rows of stitches forming a series of rolls 4 inches wide. These do not interfere with the comfort of the patient, and allow of the mattress being folded or rolled up into a comparatively small space, and to better withstand the rough usage it will doubtless have to undergo. The frames, with the beds on them, are laid on iron brackets secured to the sides of the compartments, the upper portion having a slot the entire length, corresponding with a small projection on the upper part of the bed frame, which enables the bearers to slide the frame into position, and keep it secure when there. The upper parts of the brackets are upholstered in leather, in case the patient below should come into contact with them; a small matter, but showing the thoughtfulness displayed even in small things. When wanted for use the bed is taken down, and the invalid transferred to it from the ambulance. It is then lifted into the carriage, and gently raised by pulley blocks fixed to the roof to the required level and adjusted on the brackets. The use of the pulleys enables one man standing clear of the bearers to raise the bed, leaving the two bearers free to guide it to the proper position and look after the patient. Without an arrangement of this description the bearers would be fully occupied lifting the bed, and would not have their hands free to assist the patient, an assistance which could not be rendered by a third person owing to the narrow space between the beds. To protect the patient from sun and rain whilst being transferred to the bed, an awning supported on telescopic posts can be hooked up over the door outside the carriage.

No. 7 carriage consists of a businesslike and comfortable kitchen containing a 4 feet 6 inches cooking range, well fitted up with utensils, two large filters, refrigerators, cisterns for storage of water, a bunker for coal and all other necessaries for cooking for nearly 100 people at a time. Adjoining is the compartment for the guard of the train, and beyond that again is the larder or pantry and the cook and his assistant are kept there when not working, it being their sleeping compartment as well as a pantry. Here there are a number of conveniences provided, and the natty manner in which these are all stowed away was sufficient to excite the envy of the ladies who inspected them on Saturday. Every carriage has a lavatory and closet and a small stove with a kettle for heating water. All the available space has been utilised for drawers and lockers, racks and shelves, and all sorts of conveniences, even the roof being pressed into

service; two lockers for storing linen having been constructed in the "upper storey." At both ends of each carriage is a doorway opening on to a gangway connecting with the next carriage, and as there is a centre corridor running through the vehicles free communication is secured from one end of the train to the other.

As it stood at the railway station it looked a handsome train, the pleasant brown of the highly-varnished teak, of which it is built, throwing up in bright relief the large Red Cross on a white square ground, pointed on each carriage to indicate its purpose, in accordance with the provisions of the Geneva Convention.

THE HOSPITAL SHIP "NUBIA."

Return to England.

The hospital ship *Nubia*, which left Durban on April 1st, arrived at Southampton on May 1st with 28 sick and wounded officers and 270 non-commissioned officers and men from Durban. Most of the invalids came from Intombi and Mooi River hospitals, and had gone through the vicissitudes of the siege of Ladysmith.

The *Nubia* is a P. and O. steamer that for some years past has been chartered by the Admiralty as a transport. An account of her conversion at Durban into a hospital ship was given in the British Medical Journal of February 17th, p. 408, and Sir William Stokes referred to the excellence of the arrangements made in his letter published in the Journal of March 17th, p. 663.

Captain Gordon Kelly, R.A.M.C. Militia, is the medical officer in charge, and under him there is a staff of 5 surgeons and 7 nursing sisters.

Analysis of 100 cases of Mauser Bullet Wounds.

Mr. George Ashton, M.B.Vict. (Surgeon to the *Nubia*) sends us the following observations on the Mauser bullet wounds treated on the *Nubia* during the three months ending March 31st, for which the ship was stationed in Durban harbour, and was used as a base hospital. As the result of careful analysis of the first 100 cases admitted to the *Nubia*, all of whom were wounded at Colenso or Spion Kop, I am able to give the following figures:

Return to Duty.—Of these 100 men, 40 returned to the front fit and able to resume their duties there; the other 60 were invalided to England as unfit for further service in the present campaign. These results at first sight seem disappointing, but it must be remembered that the slightly wounded men would not have been sent to the *Nubia*, which was the base hospital at the utmost limit of the lines of communication. So these 100 cases may be looked upon as those coming under the head of "severely wounded," when a return of 40 per cent. to the fighting lines is a matter for congratulation.

Duration of Illness.—The average time these 40 cases took to resume their duties was 36.3 days, or a little over 5 weeks. Two men returned in the incredibly short space of 10 days, one in 13 days, and another in 19 days; the longest in this series of cases was 64 days.

Multiple Bullet Wounds.—Two men were hit with 3 bullets; 9 men were hit with 2, whilst the remaining 89 had one bullet apiece; these 100 cases thus represent 113 bullets. In three cases 1 bullet caused 4 distinct wounds, passing in 2 cases through both legs, and in the third through the hand and leg, an excellent testimonial to the enormous penetrative power of these modern protectiles.

Site of Wounds.—The parts of the body hit were as follows:—Head, 2; face, 5; neck, 3; chest, 17; back, 6; abdomen, 2; upper extremities, 41; lower extremities, 37. The upper extremities were naturally hit the most, as the present style of warfare largely consists in firing in the prone position behind a rock or kneeling in a trench, and so the shoulders and arms are the regions most exposed. It was a matter of surprise, however, to find that of these 41 wounds in the upper extremities, 21 were in the right. I should have supposed that the left extremity would have more frequently been hit, as in the position of firing a rifle, the left arm and shoulder are well to the front. Of these 113 bullets, no fewer that 24 were retained, so my experience does not accord with that of Mr. Makins, who in the British Medical Journal of February 17th states that retained bullets are uncommon; of these 24 retained bullets 12 were removed, one through the original wound, whilst the other 11 necessitated a counter opening. The 12 remaining bullets were either localised in places where it was dangerous to attempt their removal or were causing no inconvenience, and so were left alone; their positions were: chest, 7; face, 1; groin, 1; knee, 1; elbow, 2. The *x* rays were applied in 19 cases. Bone was struck in 26 cases and 18 operations were performed, of which 4 were amputations (all fingers), 12 for removal of bullets, and the remaining 2 for removal of necrosed bone, in both cases following gunshot fracture of the humerus. Four finger amputations as the result of 113 bullet wounds would have seemed incredible seven months ago.

Shock.—As showing the small amount of shock caused by the Mauser bullet, in only 15 cases did the man struck become unconscious or faint, and the parts struck were, chest, 6; head, 2; face, 1; neck, 2; shoulder, 2; thigh, 2.

Age.—As regards the age of the men, the average worked out at 25.9 years; 2 were 18 and 19 respectively, 75 were between 20 and 30, 22 between 30 and 40, whilst 1, a colour-sergeant, was 41.

The Field Dressing.—The pocket field dressing was applied in 62 cases, either by the wounded man himself or by his comrades, and as some of these wounded men lay on the field of battle at Spion Kop for twenty-four hours before they were removed by the stretcher parties, this dressing may to an extent account for the total absence of septic cases in this series of wounds. Many surgeons from the front whom I met in Durban expressed their surprise and approval of the excellent way in which the men had bandaged one another and extemporised splints and tourniquets from rifles, bayonets, and handkerchiefs.

Finally, I desire to state in justice to the Boers that there was not a suspicion of any of these 113 wounds being due to the so-called explosive or expanding bullet.

THE MEDICAL ASPECTS OF THE WAR.

By a South African Campaigner.

XXI.

Rhodesian Field Force.

Inasmuch as the despatch of a force under General Sir Frederick Carrington to Rhodesia constitutes a new departure in military policy, the movement will be followed with considerable interest. It has for some time been felt by the authorities that the forces there were scarcely adequate to protect that country from any determined effort on the part of the Boers, and 5,000 picked soldiers will be a very welcome addition to the defences of Rhodesia. A portion of the force has already landed at Beira and others are to follow, from thence they will proceed through the low-lying, and in the summer the unhealthy country of the Pungwe Valley to the Transvaal frontier. Marandellas is a station on the Beira railway, and the route which the troops should take from this point has been the subject of a good deal of discussion among men who know the country. It is useless to disguise the fact that one of the enemies, and perhaps the chief enemy which this force will have to encounter, will be the unhealthy conditions of certain low-lying districts within Rhodesia, where malaria among men and horse-sickness among horses are both severe and even deadly during the summer months. The valley of the Pungwe up which the Beira railway proceeds has an evil reputation for these diseases, and there are other low-lying tracts of country which if not quite, are very nearly, equally objectionable. It is true that the summer months are past, and that May may be fairly regarded as one of the winter months. At the same time it is not unusual to get a certain amount of malaria even as late as this. The route, therefore, which will be taken by the force from Marandellas is one of moment. It will be possible for the force to march by way of Victoria and across the Lundy river, and through a portion of the bush veld to Tuli. The alternative route would be by way of Salisbury, Gwelo and Bulawayo to Palachwe. The former route would be shorter, but would be through a much more low-lying and less healthy district than the latter, which would offer not only the advantages of higher and healthier ground but a railway over a considerable portion of the distance. For these reasons we cannot help hoping that in spite of rumours to the contrary the Rhodesian force will be taken along what is practically the top of the watershed, through Gwelo and Bulawayo. It must be borne in mind that both horses and men are fresh to the country and therefore particularly susceptible to those diseases which are local in their origin.

Alcohol and the Native Population.

I see from the British Medical Journal of April 28th that Dr. Kolle, who had just returned from South Africa, where he has been studying bovine plague, has been giving the Berlin Medical Society the benefit of his views as to diseases in that part of the world. What the value of Dr. Kolle's observations on bovine plague may be I do not attempt to estimate, but if they are no more accurate than the political and other opinions which he appears to have given expression to in the course of his paper, the Berlin Medical Society will not have gained very much. With reference to Dr. Kolle's statement that alcohol is "the chief factor in the mortality of the negro population," I would point out that alcohol is only a deadly factor in the mortality of such negro population as can obtain alcohol. An unrestricted supply of alcohol, as a matter of fact, has been obtainable in the past wherever, with the honourable exception of the Free State, the Dutch have been masters of the situation.

Thus in the western provinces of the Colony, and on the Transvaal gold fields, the liquor traffic has been practically unrestricted and deadly in its effects. Fortunately, however,

the great bulk of the negroid races have been protected from the calamity arising from the wholesale introduction of alcohol, and protected entirely by the efforts of Her Majesty's Government, and by enlightened legislators in the Cape Colony and Natal. Thus, throughout Rhodesia and in Natal, the trade is under the severest restrictions, and is practically prohibited for natives. In Bechuanaland the same prohibition obtains, while in Basutoland, a huge native reserve under British protection, alcohol is absolutely forbidden. Fortunately, even among the large native territories recently added to Cape Colony severe restrictions have, in spite of Bond opposition, been placed upon the liquor traffic. The great bulk of the native races therefore is, thanks to the efforts of British statesmen, untouched by the evils of alcohol. Wherever it has been freely obtainable, throughout the whole of Africa, alcohol has played havoc among the negroid population. So far then, Dr. Kolle's observation is correct. But, inasmuch as the great bulk of the negroes throughout South Africa never get alcohol at all, it cannot be said to be one of the chief causes of mortality among them. He further speaks of the progressive disappearance of the negro races. If, as this observation would appear to imply, he is under the impression that the negro races of South Africa are diminishing in number, he has entirely failed to acquaint himself with one of the cardinal facts of the history of that country. As a matter of fact, one of the great problems for future statesmen to deal with is the rapid increase of all the Bantu tribes (who are by far the majority of the native races.) Wherever they have been placed under some form of settled government, and where such peace and order have been established as obtains in the native reserves under British control, the Bantu or Kaffir tribes are as hardy and virile a race of men as exists on the face of the globe, and more prolific even than the Boers themselves. In Basutoland, for instance, the Bantu tribes have increased with phenomenal rapidity; the only natives who have practically disappeared are the Bushmen. The Hottentots, who have been the greatest victims of alcohol, and were practically enslaved by the Dutch, have certainly not increased in number of recent years, but even to-day it is a moot point whether even they have actually diminished. But with regard to the Bantu there can be absolutely no doubt. Their increase can only be compared to the increase of the native population in India since the establishment of law, order, and authority in that Government.

BASE HOSPITALS.

My correspondent with one of the base hospitals says of the Boers recently sent down:

Many were in a sad plight, having come from Kimberley and Jacobsdal. The Boer on his admission to a civilised hospital has to learn several things—to go to bed without his trousers, boots, and hat; to wash himself occasionally as a matter of form; to cease smoking during certain of the twenty-four hours of each day; to limit his appetite in accordance with the army supplies; to read literature other than the Bible; not to sing hymns at midnight, but allow our poor Tommies to sleep. As a patient he is not to be compared to Tommy Atkins; he is like a big baby, and hates bed. He clamours for a solid diet when he has an attack of enteric fever, and persists in rising from his bed when not actually under observation. It is an interesting fact that many of the cases admitted to the hospital for gunshot wounds developed enteric fever after being in for over a fortnight or three weeks. I am trying to get to the front, but as everyone is doing likewise, there is little chance of my being moved. The "front" is the hope and the ideal of the civilian surgeon, but few are chosen.

AMERICAN CLIMATOLOGICAL ASSOCIATION.—The American Climatological Association held its seventeenth annual meeting at Washington on May 1st, 2nd, and 3rd, under the presidency of Dr. Abraham Jacobi of New York. Among the papers read were the following: Dr. Arnold C. Klebs, Chicago, the Construction and Management of Small Cottage Sanatoria for Consumptives; Dr. Charles Denison, Denver, the Educational and Legislative Control of Tuberculosis; Dr. H. P. Loomis, New York, Some Personal Observations on the Effect of Intrapleural Injection of Nitrogen Gas in Tuberculosis; Dr. E. R. Baldwin, Saranac, N.Y., Bacterio-Therapeutics, with Especial Reference to Tuberculosis; Dr. J. Edward Stubbert, Liberty, N.Y., Subsequent History of a Patient Apparently Cured by Antitubercle Serum; Dr. W. D. Robinson, Philadelphia, Petroleum Oil in the Treatment of Phthisis; and Dr. Andrew H. Smith, N.Y., the Inadequacy of the Physical Signs as Indicating the Gravity of Pneumonia.

GERMAN CONGRESS OF MEDICINE.

[FROM OUR SPECIAL CORRESPONDENT.]

(*Concluded from page 1056.*)

Wiesbaden, April 21st, 1900.

ENDOCARDITIS: ITS RELATIONSHIP TO OTHER DISEASES. THIS, the other and remaining subject set down for discussion at this Congress, was introduced by

LITTEN (Berlin), who first referred to the ulcerative form which he divided into that variety of purely septic origin, and the other affection which is secondary to acute rheumatic diseases, peliosis, purpura, chorea, or gonorrhœa, though the latter variety might very much resemble the true ulcerative disease, differentiated the two, owing to the clinical, anatomical, and bacteriological modifications. Further classification he based on clinical and etiological factors, because every degree of severity could be found between mere valvular alterations and actual ulcers. An essential feature of the pure ulcerative disease was the parasitic nature of the progress towards necrosis and ulceration excited by a microbe. The ulcerative appearance was not always reached by the patient, who often died while only exudation was apparent. Litten, therefore, distinguished the following forms: Benign endocarditis, malignant but non-ulcerative endocarditis, and malignant ulcerative endocarditis, taking, moreover, with each the etiological factor into consideration. Benign endocarditis was not an independent disease, but only a complication of some other disease. It did not always show its presence, and was recognised by its consequences. The author proceeded to describe the well-known symptoms of ordinary endocarditis. Its complications were fibrinous pleurisy or even pericardial effusions, and should death occur during the acute attack it was invariably due to the exciting disease. He described the pathological changes, and laid stress on the fact that there was great inclination towards a favourable metamorphosis, namely, sclerosis, leading to sclerosis retraction and shortening of the valve. Absolute absorption might occur, but often a chronic stage supervened with further development of valvular defects. The susceptibility of the left side of the heart he attributed to the greater amount of work it had to perform. When due to gonorrhœa, bacteriological proof was easy. As to bacteria of acute rheumatism, the author mostly found negative results, but often discovered diplo strepto-staphylococci. Nevertheless, he was convinced that endocarditis and rheumatism, when existing together, depended on the same exciting factor. As to gonorrhœa, it might produce both benign and malignant endocarditis, and might be followed by permanent valvular trouble or resolution. Affection of joints was not a necessary connecting link between the onset of gonorrhœa and the cardiac affection. In gonorrhœa both affections were gonococcic metastases, which might appear together or independently. Another rheumatic affection having a connection with endocarditis was purpura hæmorrhagica, which the author regarded as a specific infectious disease. This cardiac affection was invariably benign. The affections of the heart accompanying chorea, acute exanthemata, or pregnancy were not necessarily of rheumatic origin, but often part of the individual disease. Fatal cases of chorea were due to delirium or collapse following a large number of attacks, and not the result of any endocarditis. In the above cases bacteriological investigations gave no positive results. The malignant non-ulcerative variety never occurred spontaneously, but was always accompanied by a severe disease, and by itself constituted a grave danger to life. Thus it was found in cases of acute rheumatism, chorea, and gonorrhœa if with chorea as part of a severe rheumatic complication. Thus both with gonorrhœa and rheumatism the more severe cardiac affection presented a higher degree of infection, and from the clinical point of view this cardiac affection lay between the benign and the purely septic varieties. Therefore the symptoms sometimes inclined towards the one, at other times towards the other disease. The prognosis was not absolutely bad. Anatomically the changes were either warty or ulcerative, sometimes both being present at the same time, but without pyæmic deposits. The symptoms appeared accompanied by pyrexia after subsidence of the rheumatic pains. In other respects they were much like those of the benign form, but there was a more serious general condition, such as enlarge-