THE WAR IN SOUTH AFRICA.

SURGICAL NOTES FROM THE MILITARY HOSPITALS IN SOUTH AFRICA.

(With Special Plate.)

[From our Special War Correspondent.]

Injuries of the Long Bones.

Few injuries met with in the military hospitals are of greater surgical interest than bullet wounds of the long bones. These injuries may not possess the almost sensational interest that attaches to some of the more remarkable penetrating or perforating wounds of the cavities of the body or of the head; but they exhibit very remarkable features, and tax the skill and patience of the surgeons to the utmost. It is of course premature, in commenting on these as on any other class of injuries, to deduce, at present, too definite conclusions. The opinions that seem to be now generally entertained, so far as I have been able to gather them from others, and supplement them by my own observations, may be greatly modified by further experience. It must also be freely acknowledged that on several points opinions are by no means unanimous, as, for instance, the difference of effect noted in injuries received at short or long range. At the same time, it is tolerably safe to assert that the "humane" character of the small-bore bullet wound is just as strikingly exemplified in lesions of the long bones as in other varieties of injuries. Not only limbs but lives are saved that previous military surgical experience would have been led to consider hopeless; but I believe it to be true, however unflattering the statement may appear to be, that this gratifying result is mainly due to the character of the wound, and but little to any general advance in surgical procedure, or even to any perfection in carrying out from the first the antiseptic treatment. Hitherto pyæmia, erysipelas, and the like preventable disorders, if they have been met with at all, have been of the very rarest occurrence. Nothing can be more gratifying or satisfactory, but this admirable result must be ascribed to its true cause. Even suppuration is rare, but there is no doubt that it is beginning to be seen more frequently than at first. The next campaign may take place under very different conditions of climate to the present war, and amidst unfavourable surroundings the enormous value of antiseptic treatment of wounds is likely to show out much more clearly; for, truth to tell, there is a good deal that might sometimes be justly criticised in the military hospitals with regard to the carrying out the details of antiseptic treatment. The undoubtedly successful results shown by the hospitals constitute rather a triumph for the open-air method than for antiseptic principles as ordinarily practised.

Distortion of the Mauser Bullet.

It is desirable at once to modify the opinion expressed in a previous letter with regard to wounds from ricochet bullets. At first it was imagined that most of the bullets that were much distorted and showed splitting up of the nickel sheath (such as Nos. 3 and 4 in Fig. III, see Special Plate) were ricochet shots. Some of them may be, but there is no doubt whatever that prodigious distortion may be produced in a Mauser bullet if it strikes the shaft of a long bone. The Mauser bullet has a much thinner sheath than the Lee-Metford. The illustration (Fig. IV) shows a Mauser and a Lee-Metford bullet side by side, of the natural size. The bullets were on precisely the same plane when the photograph was taken, and the comparative sizes can therefore be easily gauged. A section has been made through the upper portion of the bullets, so as to show the respective thicknesses of the nickel sheath. It will be interesting, hereafter, to learn whether the effect on the long bones, and in the bullet, differs at all in the case of the Lee-Metford. Doubtless some opportunities have been afforded of judging of the nature of the wounds made by our rifle, though the remarkable returns of casualties furnished by the *Standard and Diggers' News*, or issued from Pretoria, do not seem to hold out any great probabilities in that direction.

Conditions Influencing Extent of Damage done to Bones.

The extent of damage done to the bone depends, of course, materially on the portion that is struck, the effects on the elastic shaft, with its large amount of compact tissue, being different from the effects on the cancellous ends. Again, the range must be taken into account. There is, however, great difficulty in obtaining reliable information on this point. Apart from the not unnatural tendency on the part of the men to assume that their wounds were inflicted at very short range, the conditions under which many of the engagements were fought must have rendered it almost impossible to estimate the range. Too often our men have been exposed to fire from many quarters, and with an almost invisible enemy using smokeless powder little more than a vague guess can be expected. In certain actions, however, it is probable that the bulk of the wounds were inflicted at short range. Thus the Highland Brigade at the battle of Magersfontein were beyond question very close to the enemy. In others, such as the action of Willow Grange, the wounds were inflicted at long range. Judging by skiagraphs and by close examination of the very numerous cases met with in the hospitals, the difference between the injuries inflicted at short and long range is less than would be expected. It is imagined by some that a small bore projectile, travelling at very high velocity and rotating rapidly through a bone, exerts a kind of expanding action in the bone, bursting it, in fact, and producing the same sort of effect as at short range it certainly does in the skull. The evidence of such effects is not very conclusive.

A further point that must be taken into account is the angle at which the bone is struck. The bullet may hit the shaft full in the centre, strike it more or less obliquely in its length, just touch the edge of the diaphysis, or groove the bone transversely. The line drawn between the apertures of entrance and exit, when both openings are present, does not afford a very reliable clue. Nor, it must be admitted, in many instances does skiagraphy. The difficulties, for example, of getting a satisfactory skiagraph of a fractured femur in a muscular young man are very considerable. In the hospitals the patients have to be transported a long distance, and the good that might be gained from a skiagraph showing the nature of the fracture would be more than balanced by the harm that would result from rousing the patient and disturbing the part. Skiagraphy therefore in injuries of the long bones of the lower extremity is usually deferred until some union has taken place. The appearances then are misleading, for the callus is pervious to the rays.

Bullet Wounds of Cancellous Bone and Joints.

Bullets striking the enlarged and highly cancellous extremities of long bones appear to drill cleanly through only in certain situations. Thus many cases are met with in which the condyles of the femur must unquestionably have been drilled through without fracture taking place. The patella is usually drilled (but may be simply fractured), and cases are numerous in which the course of the bullet shows that the end of the femur must have been perforated as well as the knee-joint. The recoveries from such injuries are now so familiar as almost to have ceased to excite especial interest. Here the range, as far as can be judged, has little effect in determining the extent of the injury. At very short range we should expect, if any bursting action were exerted on the bone, that fractures of the lower end of the femur extending into the knee-joint would be common. I have scarcely been able to find any. Hæmarthrosis is a frequent symptom, but the swelling usually subsides rapidly. A major in the R.A.M.C., who had seen active service in Chitral, remarked to me on the astonishing contrast between wounds about the knee in that campaign and the present one. A bullet striking the patella and injuring the femur in that campaign was likely to convert the cavity of the knee-joint into a mere bag of comminuted fragments of bone. Amputation was the only resource. In the present campaign it seems scarcely necessary to put on a splint for a few days. Strangely enough the upper end of the tibia does not seem to behave in the same way. I have at any rate seen several instances in which this portion of the bone was extensively splintered by bullets, and the fracture might then extend into the knee-joint. Much the same effect is seen when the lower end of the tibia is struck, and, indeed, some of the most troublesome cases to deal with, as regards saving the limb, are those in which the lower end of the tibia is

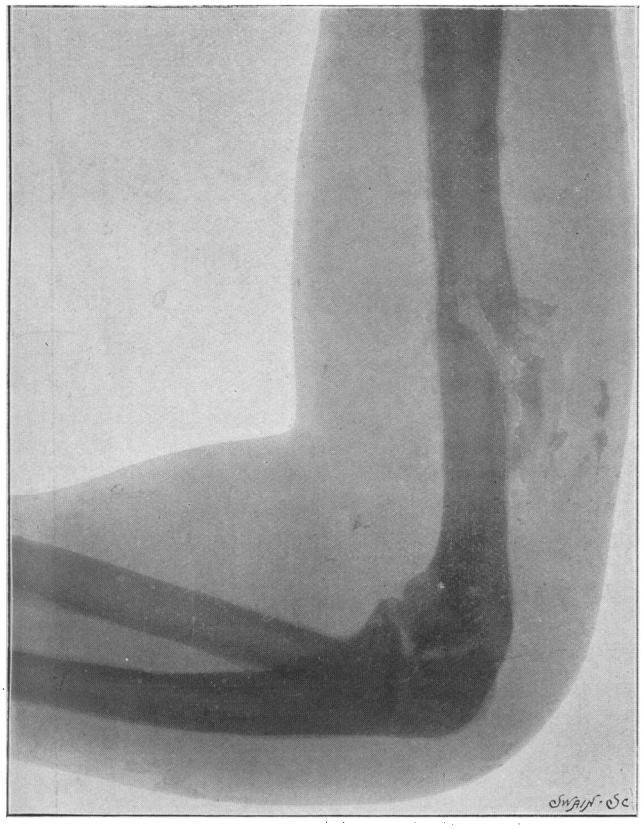

Fig. I.—Skiagraph of bullet fracture of humerus.

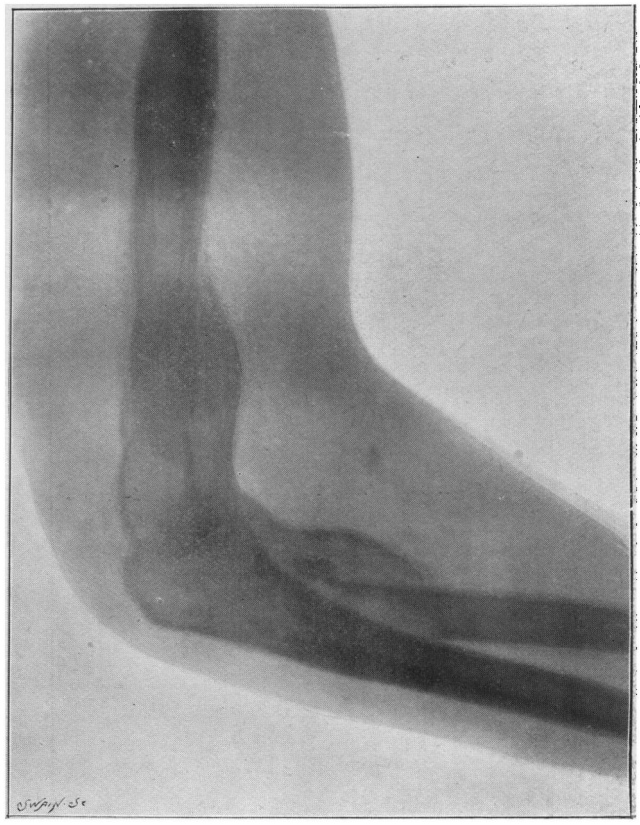

Fig. II.—Skiagraph of bullet fracture of radius and humerus.

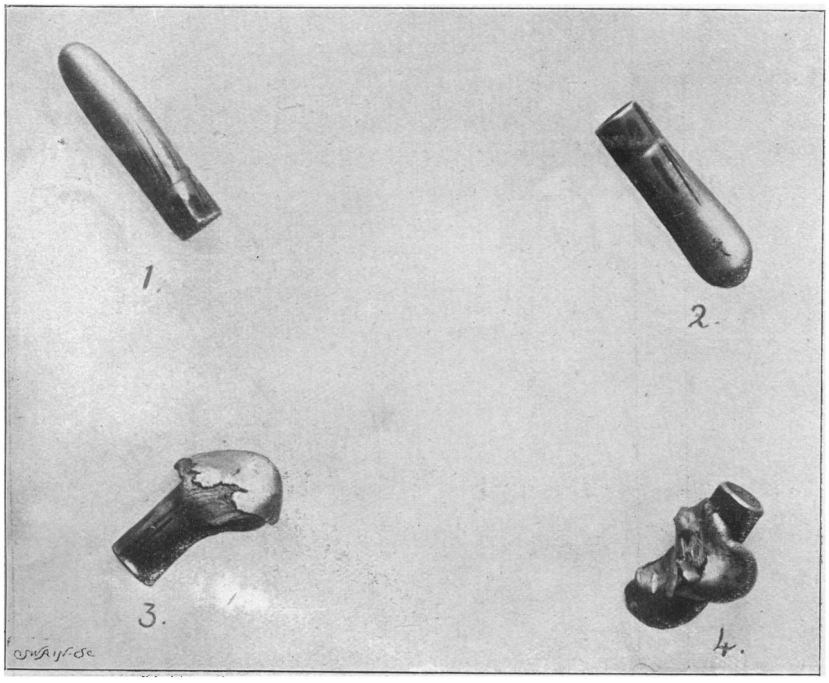

Fig. III.—Mauser bullets distorted by striking bone (from a photograph by A. Allerston, Pietermaritzburg).

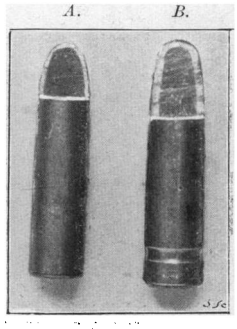

Fig. IV.
A, Mauser; *B*, Lee-Metford.

broken up, and where the injury extends into the ankle-joint. The clavicle is often simply fractured, and not a few cases have been seen in which this bone has been broken by a bullet that had previously passed through the neck or through the skull. I have met with no cases in which the head of the humerus was cleanly drilled without fracture, though some such may have been recorded. The lower end of the humerus may be drilled, but it is more common for a large fragment to be broken off. Here again, when the bullet has traversed the elbow-joint, surprisingly little trouble follows. Complete restoration of mobility is the rule, unless (and this is common) the amount of callus thrown out limits the movement. The lower end of the radius might be drilled, if the bullet entered on the anterior or posterior aspect, just as the carpal or tarsal bones may be drilled. Of such injuries to these small bones mention has been made in a previous letter.

Bullet Wounds of the Shaft of Long Bones.

It is stated by some, and the opinion seems to be borne out by experiments in the cadaver, that at very close range a bullet striking the shaft of a long bone will sometimes break clean off and carry out through a large aperture of exit a portion of the entire shaft of the bone some inches in length. It is difficult to understand how such an injury is mechanically brought about by a small-bore bullet, but any such observation resting on a sound experimental basis is conclusive. I have met with no such cases in the wards, though this of course does not imply any question of their occurrence. The only instance resembling the injury I saw in the Fort Hospital at Pietermaritzburg. A large portion of the ulna had been carried clean away. But this injury was inflicted by a small shell fired from a Nordenfeldt or Hotchkiss gun, and the aperture of entry is of course proportionately large. Compound fractures showing a small aperture of entrance and a large one of exit are common enough, but the tendency of the fracture seems almost invariably to be oblique. The Mauser bullet at short or long range, will break up the bone it passes through into numerous little fragments, which it carries up to or through the aperture of exit. In Fig. V, for instance, taken from

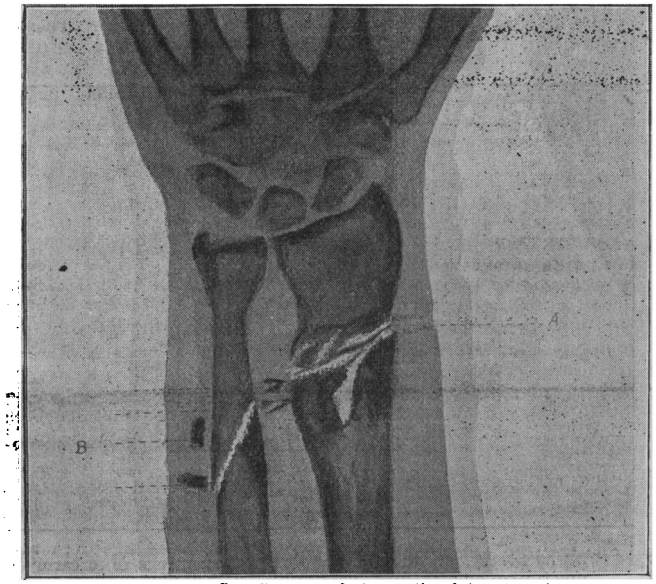

Fig. V.—Trooper M., I.L.H., wounded at Elandslaagte, close range (150 yards). *X*-ray examination to show nature of fracture and slight displacement of fragments. (Drawn by Dr. J. F. Briscoe from a skiagraph the property of Dr. L. G. Irvine.)

the arm of a private in the Imperial Light Horse, wounded at Elandslaagte, the range was certainly very short, though it may have exceeded the estimate given of 150 yards. The radius is seen to have been transversely grooved. The bullet, entering on the radial and passing out on the ulnar side, has carried away a number of small fragments of bone and spread them along its track. The aperture of exit was small. The radius in this case was completely fractured, the break having but a slight obliquity. The fragments, as seen, are scarcely at all displaced. The large aperture of exit, when it is found, is usually the result of a number of broken pieces of bone, many of them of considerable size, being carried through the wound. In its action on the shaft of a long bone, therefore, the Mauser bullet may behave like the old round bullet. And these effects may be produced when the bullet undergoes no alteration whatever in shape, but passes clean through the limb, making an aperture of exit the same in size and character as that of entrance. In such cases, of course, the comminuted fragments of bone are not driven out of the limb, but merely displaced more or less. It does not at all follow, therefore, that because a bone is extensively comminuted, or even that there is great laceration of the soft parts, that the provisions of the Geneva Convention have been necessarily infringed. That bullets are in some instances "doctored," and that forbidden kinds of bullets are occasionally used, is beyond all question true, for such bullets have been removed; but it is but just to state that instances of the kind are of extreme rarity. In any kind of contest the mere suggestion of unfair play is apt to make people lose their heads quickly, and when in warfare the question of infringement of methods sanctioned by civilised communities is raised, exaggeration is prone to run riot on very slight evidence and on very insufficient data. That Mauser bullets, when they impinge on the elastic shaft of a well-grown bone in a young man, may undergo much distortion, though they have not been submitted to any previous tampering, seems perfectly clear. The bullets shown in Fig. III, all of which were extracted, furnish proof enough. No 1 was removed from beneath the infraspinatus muscle. The bullet had struck the humerus obliquely, and caused an oblique fracture of the bone. It had then probably altered its course, and glanced upwards, lodging beneath the muscle. The bullet is seen to be slightly bent over at the point, and flattened at the base, but the distortion is really greater than it appears in the photograph. The bullet was almost certainly fired at long range. The aperture of entry was that of a normal Mauser bullet, so that (as also in the case of the other bullets shown in the illustration) the distortion must have been produced by striking on the bone. It may be noted with regard to this case that, though the Mauser bullet appears invariably to make a perfectly straight track from entrance to exit when it remains of normal shape, it may when bent up deviate more or less, possibly in some cases behave like the round bullet in former days, which, if it struck an elastic bone like a rib, might glance half way or more round the body.

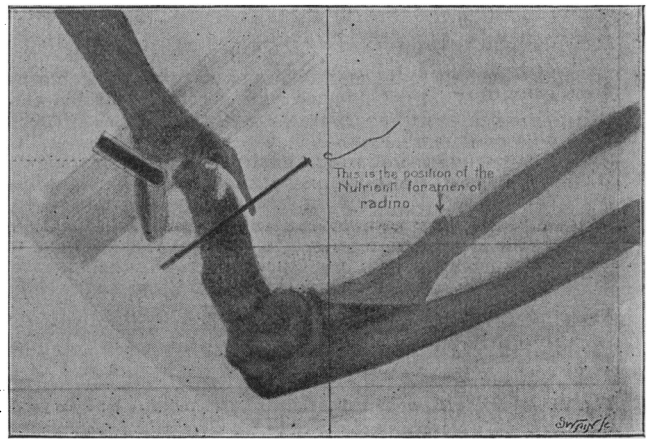

Fig. VI.—McG., wounded at Colenso, December 15th; range 400 or 500 yards. Fracture of humerus. Bullet is No. 2 of Photograph III. Considerable comminution. At operation humerus was found to be fissured into joint. Bullet extracted. Entrance 2 inches external to middle line of arm, just above bend of elbow. (Drawn by Dr. J. F. Briscoe from a skiagraph the property of Dr. L. G. Irvine.)

Fractures of the Arm and Forearm.

No. 2 bullet (Fig. III) had struck the humerus almost at right angles. The range at which it was fired was probably 400 or 500 yards. The shaft of the bone is obliquely fractured and

distorted. A plate of bone was broken away from the posterior surface, and carried backwards, but not wholly detached. In addition, a fissure extended from the site of the main fracture downwards into the elbow-joint. The bullet is seen to be considerably bent over at the point and flattened. The nickel sheath is not split. Here, again, the distortion of the bullet is actually greater than appears in the photograph. The bullet was extracted and the case did well. As invariably happens when a plate of bone is partly detached, and does not separate, the amount of callus thrown out was very great. The nature of the fracture is shown by Fig. VI, drawn from a skiagraph.

No. 3 (Fig. III) shows the effect produced on a bullet that struck the middle of the femur at a range of 600 or 700 yards. The bone was extensively splintered and the amount of callus thrown out was very great. The bullet is greatly distorted, and "mushroomed." The nickel sheath has been burst, but, as can be seen, the covering on the point of the bullet is intact. If such a bullet had been picked up in the ground it might have been thought that it had been tampered with before firing. But the whole of the distortion was evidently the result of the impact on the bone, for the entrance wound showed the exceedingly small scar of a normal Mauser bullet and it was extracted from under the skin in the postero-internal aspect of the limb at the junction of the upper and middle thirds. The bullet had therefore probably glanced upwards after striking the bone.

No. 4 was fired at a longer range than any of the others shown, probably about 1,300 yards. The wound of entrance, again, was that of a normal Mauser bullet, and was situated in the mid-line of the thigh in its anterior aspect. The course of the bullet was in an upward direction, and the bone was struck obliquely. The bullet was removed from beneath the skin, some 3 inches below the great trochanter, in the postero-external aspect of the limb. The splintering of the bone was extensive, and a large plate of bone partly detached from the posterior aspect of the femur had been shifted backwards towards the wound of exit. The bullet shows remarkable distortion. The sheath over the point is not split, but the anterior quarter is twisted round and bent back so that the top of the bullet lies half way down and is attached by the nickel sheath only. The split portions of the sheath project like wings. The distortion of the bullet was certainly not in this instance due to a ricochet, for the aperture of entrance was that of a normal Mauser. The track of the bullet from the entrance down to the bone was such as might be seen in a flesh wound, and there was no undue laceration of the soft parts. The chief mischief was in the direction of exit.

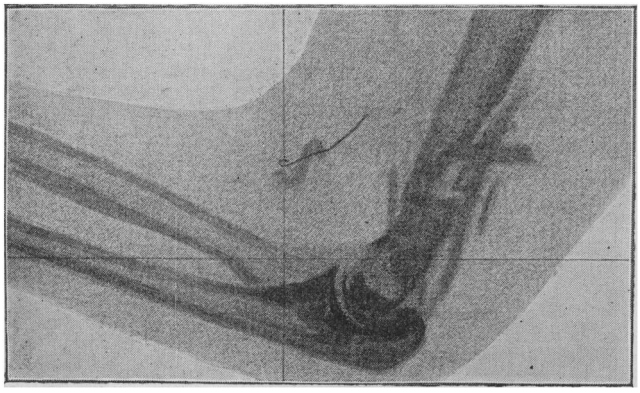

Fig. VII.—Private M., wounded at Colenso, December 15th; ? 700 yards. Entered posterior surface of arm in middle line. Bullet extracted. Bullet was bent over at the point and flattened, but nickel not burst. (Drawn by Dr. J. F. Briscoe from a skiagraph, the property of Dr. L. G. Irvine.)

For the specimens and photographs, as well as for many notes on cases of bullet injuries of the long bones, and for much valuable information, I am greatly indebted to Dr. L. G. Irvine, one of the civil surgeons in charge of patients at the Fort Hospital, Maritzburg. Fractures of the long bones caused by the small-bore bullet at almost any range are, as will be seen, commonly, if not almost invariably, oblique, and sometimes very oblique. The lines of fissure, starting from the point of impact, radiate out in different directions and often to a great length, even when the bullet meets the shaft almost at a right angle. Fig. VII may be cited as a good case in evidence. The probable range was about 700 yards. The wound of entrance was over the posterior aspect of the arm. The bone is obliquely fractured, and one or two loose fragments are seen lying in the soft tissues. The bullet, which was embedded in the bone, was bent over at the extremity and flattened, but the sheath was not split.

Fig. I (Special Plate) is a reproduction of a skiagraph showing a rather more extensive injury to the humerus, though the range was probably longer; as far as could be judged, about half a mile. The bullet in this case passed through the left mamma and great pectoral muscle, and struck the bone full on the inner side some 5 inches above the elbow-joint. Numerous fragments of bone are seen to have been carried outwards and backwards by the bullet. The aperture of exit was large. The bone again is fractured obliquely. This patient is making a good recovery, and union promises to be good.

The treatment generally of cases of fractured humerus leaves little to be desired, and it is abundantly evident that the fractures are most efficiently put up in the field hospitals.

Fig. II (Special Plate), also a reproduction of a skiagraph, shows an injury of which several examples have been shown by skiagraphy, and illustrates the point that whether a long bone is struck obliquely or directly, the fracture is likely to be very oblique. The man was carrying his rifle at the slope, over his shoulder, when he was hit, and his arm was therefore flexed at about a right angle. The bullet has fractured and split the radius; one or two small fragments of bone are seen lying near the elbow in the soft parts. The lower end of the humerus is also fractured, and a large plate of bone is slightly displaced backwards. The fissure probably extended into the elbow-joint. The bullet may have traversed or may have just missed the elbow joint. The wound of exit in this case was large. The range was estimated at five hundred yards. This wound was received in the fighting by the Tugela river on January 24th. Union was progressing favourably. In the Fort Hospital was an almost exactly similar case as regards the injury to the bones (Fig. VIII). The range

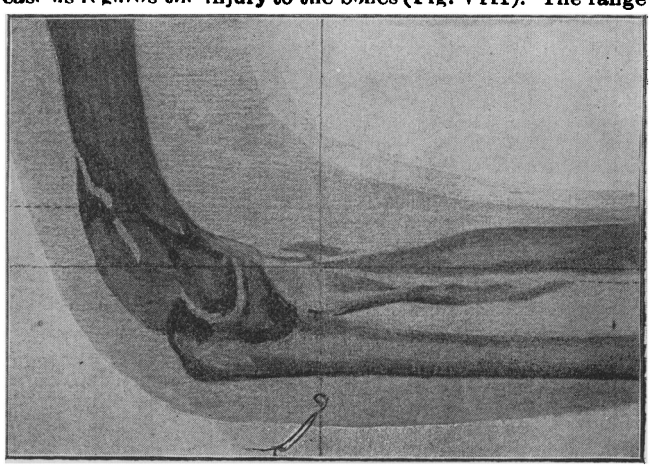

Fig. VIII.—Sergeant H., wounded at Colenso, December 15th; range 400 or 500 yards. Entrance on posterior surface of forearm at juncture of middle third just to radial side of ulna. Entrance in a line with internal condyle and ¾ inch nearer middle line of arm. Both normal Mauser wounds. Fair movement five weeks after. (Drawn by Dr. J. F. Briscoe from a skiagraph the property of Dr. L. G. Irvine.)

was the same. The bullet in this latter instance had certainly traversed the elbow-joint, and the wound of exit was precisely like that of entrance. The patient, a sergeant, was wounded at Colenso on December 15th. Good union had taken place. The movements of pronation and supination were free, but owing to the amount of callus thrown out round the fractured humerus, flexion of the elbow was limited. No

surgical measure short of a complete excision of the joint could have restored full mobility, and any such operation appeared quite unjustifiable.

Fractures of the Femur.

In previous wars compound fracture of the femur high up was reckoned as almost inevitably a fatal injury. The septic complications that so continually ensued carried off the patient, and amputation very high up or at the hip-joint was almost uniformly fatal. With improved methods of operating, and with the enormous additional security of antiseptic treatment, it was thought probable by many, at the outset of this campaign, that a fair percentage of recoveries might be looked for in this class of injuries. Such is certainly the case, but the gratifying, if rather unexpected, feature has been that these patients recover at times without amputation. Here again the nature of the wound, which admits little or no air into the depths of the limb, the fact that portions of clothing or other foreign bodies are rarely carried into the wound, and the absence of septic influences, all influence this desirable consummation. The excellence of the result, to be candid, is not due so much to the perfection of the antiseptic surgical practice as to the fact that the surroundings of the patients are highly favourable. I am far from suggesting that the most elaborate and thorough precautions should not invariably be taken in every surgical detail, small or large. It is impossible to have too many lines of defence, to borrow a military phrase. I simply want the true explanation of the satisfactory results to be given, so far as I am competent to judge.

Another point—and a very important one—tells greatly in favour of the remarkable recoveries so often witnessed. The men are not only healthy, strong fellows, but they are also in exceedingly good condition. The hardships and privations of a campaign must always be considerable. With a lack of good organisation they may become intolerably severe, and the effect is quickly seen in the surgical practice of a hospital. The good organisation of the Transport and Commissariat Departments is a matter of infinite moment to the surgeon anxious that all his cases should progress well. The medical officers would, I believe, be perfectly unanimous in acknowledging that the Commissariat Department is doing its work most admirably, and few really are better able to form a judgment on the point. No department, it appears to the civilian, is more singled out for blame when anything goes wrong, and no department is less likely to receive its due meed of praise when matters go right.

An instance of fracture of the femur high up may be quoted as an example. The bullet struck the femur just below the lower trochanter, and fractured the bone, as far as can be judged by the skiagraph, almost transversely. Indeed this case shows the nearest approach to a purely transverse fracture that I have been able to find. The range was certainly a long one, in all probability not less than 1,000 yards. There was but little splintering of the bone. It is to be noted that the bone was not struck at an elastic part. Some would ascribe the good result (for the case did well) to the length of the range and the fact therefore that no expanding action was exerted in the bone as the bullet passed through. But in the face of the other cases mentioned above, where the injury was inflicted at quite as long a range and where extensive splintering resulted, the line of argument is hardly convincing.

Complications of Fractures of Long Bones.

Of the complications attending fractures of the long bones there is, happily, not very much that need be said. The chief trouble is often impairment of mobility in the neighbouring joint owing to the large amount of callus thrown out. The great amount of thickening so often observed is, of course, due to the frequency with which the bones are split up and expanded, and also to the frequency with which large plates of bone are partly detached from the main shaft maintaining their hold by the periosteum, which preserves its vitality. A frequent complication of fracture of the upper part of the shaft of the hemerus, as might be expected, is impairment or complete destruction of function of the musculo-spiral nerve. Many instances of this are met with. Such cases seem, for the most part, beyond the reach of surgery, and the paralysis when present is likely to be, in most instances, permanent. Of less frequency, but still occasionally met with, are cases in which the median or ulnar nerves in the arm or the peroneal nerve in the leg have their functional activity destroyed.

While nearly all the fractures unite soundly with a tendency, as pointed out, rather to excessive formation of callus, no union or soft union is met with now and again. There are two patients now in the Fort Hospital with delayed union: one, an officer, with an exceedingly oblique fracture of the middle of the femur, has very imperfect union, if any, at the end of two months; another, a private, has soft union, after a splintered fracture of the lower part of the shaft of the tibia. In the latter case consolidation seems likely to take place. The wound had been sustained about eight weeks previously.

Occasionally blood vessels have been injured by splinters of bone. In one rather remarkable case in which the bullet had apparently perforated the shaft of the tibia about the centre, hæmorrhage took place on several occasions from the anterior wound. Finally, a considerable swelling formed in the calf of the leg. This, on being cut down upon, proved to be blood, the result of a perforation of the posterior tibial artery. There was, however, no pulsation or *bruit* in the swelling. The clots were turned out, and it was found necessary to ligature both the anterior and posterior tibial arteries. Free collateral circulation had, however, been established, and the case did well, though the wound is not yet entirely healed, and it seems probable that a small sequestrum may separate.

Amputation has been resorted to in but few instances, and it is likely that the statistics of operations which will be forthcoming at the end of the war will show that conservative surgery has been the rule.

Osteomyelitis seems to be unknown so far as I have been been able to ascertain.

The treatment of fractures of the femur has not in all cases been as satisfactory as could be wished for at first; at any rate the supply of extension apparatus was inadequate, and moreover the bedsteads are too often unsuitable for the proper management of fractures of this description.

Maritzburg, Feb. 17th. Clinton T. Dent.

AT NAAUWPOORT.

By Sir William Thomson,
Surgeon-in-Chief, Irish Hospital, Field Force, South Africa.

Naauwpoort Camp, March 26th, 1900.

No. 6 General Hospital.

No. 6 General Hospital has been here for four weeks, and up to March 23rd about 1,400 sick and wounded had been admitted for treatment. Five days after Colonel Somerville Large and his staff arrived from England they were able to receive about 500 men, and since then the accommodation has gone on increasing until now about 650 beds are available; 200 more have arrived, and will be prepared as soon as possible.

Sick and Wounded.

Of the cases, 400 were gunshot injuries; the rest comprised all sorts of affections—enteric fever, dysentery, diarrhœa, pneumonia, etc. These have nearly all come from other camps at the front. The enteric cases—of which there have been 105, are from the Modder, Rensberg, Norval's Pont, and Kimberley. Most of them have been in the record week of the disease, have been exposed to all the hardships of the campaign, and have been walking about since the disease was running its course. The deaths have been 16, or 15.23 per cent. of those treated. From time to time the hospital train arrives and removes 100 patients who are convalescing, and these are carried to the Cape, or a few hundred miles nearer the hospitals there. Thus the strain upon the advanced hospitals is relieved, although at times it is considerable. In the period of quiet which has elapsed since Paardeberg no wounded men have arrived here.

Staff and Equipment.

The staff which has this great hospital in charge is—
Lieutenant-Colonel Somerville Large, P.M.O.
Lieutenant-Colonel Falney (Medical Division).
Major R. Jennings (Registrar).
Major J. Osburne (Surgical Division).

Lieutenant H. C. R. Hime.
Captain Osborne (Canadian Medical Staff).
Civil Surgeons J. A. H. Brincker, P. C. P. Ingram, R. D. Maxwell, H. T. Murrell, J. Owen, W. M. Parham, E. C. Parry-Edwards, F. Pershouse, H. T. Shea, J. Stevenson, S. Wells, and R. D. Parker.

The marquees in which the patients are accommodated are excellently equipped; most of them have been provided with boarded floors by the Engineers, and the remainder have waterproof sheeting: but these will in turn be made like the others. The bedsteads are, as I have said in a former letter, iron, with wire-woven mattresses. There are tables, forms, and easy chairs. Each bed has clean cotton sheets, and each patient a pair of bedroom slippers. There is plenty of literature, and those who are able to be up occupy their time in reading or in playing games with their comrades who are still in bed. The food is good, and varied according to the needs of the individual. Men who have served in many campaigns tell me that the hospital arrangements are a great advance upon anything that they have seen before on active service; and taking No. 6 as a type, I can well understand that.

Civilian Aid.

But it must also be remembered that all this efficiency has only been secured by a departure from previous methods. Never before was so large a civilian element imported into our army medical arrangements in a campaign. The present Royal Army Medical Corps could never have dealt with the demands upon it had it not received help. At certain places the work would have been excellent, but it must have failed in keeping up that standard in the many scattered places and on the field itself. But the corps as a framework has been judiciously expanded, and civil surgeons have been fitted into it, and in this way the necessary machinery has been effectively worked. What is obvious is, first, that the R.A.M.C. is entirely undermanned for any unusual demand upon it; that it is deficient in the number of surgeons, orderlies, and nurses; and that some time in the future, when the experiences of this war come to be weighed, a new and better scheme must be adopted. More nurses are wanted at the base hospitals; their number at present is inadequate. And when this part of some future scheme comes to be considered it will be necessary to see that no amateur nurses are permitted to join—even in an emergency.

The German Hospital at Jacobsdal.

I met a few evenings ago the Colonel of Highland Light Infantry, who was commandant of Jacobsdal after its capture. There he found a German hospital equipped for service with the Boers. He told me that the arrangements were excellent, and that nothing could exceed the kindness of the medical officers and the whole staff to Boers and British alike. I am glad to record this testimony, which may in this way reach the generous people who provided funds for the hospital.

The Camp.

At this camp we have had between 7,000 and 8,000 men; they are coming and going daily; some are from England, some from the Modder, all are on the journey northward. Then there are thousands of horses and mules, and a crowd of Bengalis and local natives in charge of remounts. As is usual in such circumstances, there is a good deal of mild dysentery. When such a crowd of living beings is gathered about a small town where sanitary arrangements are in a rather elementary state, this is to be expected. The danger is that in course of time what at present is only a threat of trouble may become a reality. So far only one or two cases of enteric have been admitted from the camp, and they were probably infected before arrival; but with regiments arriving from a district where enteric fever is rife these isolated cases may be only the forerunners of a greater number; therefore the most rigid precautions as to sanitation around the camp must be enforced everywhere. Colonel Large is fully alive to this, and has taken steps to meet possibilities.

Winter Storms.

The winter appears to have come. The temperature has fallen, and we have had some winds as penetrating as those of March at home. But our worst experience has been a combination of rain and storm. The night before last this combination operated with great suddenness, and everyone had to turn out at midnight to loosen tent ropes and keep the pegs in the ground. But last night the rain fell for hours in torrents, making sleep almost impossible by the crash upon the canvas. It filled the deep trenches to overflowing and swept across the camping ground in sheets. Fortunately there was no such catastrophe as happened to the hospital a couple of weeks ago, when nine marquees came down in a storm of rain, and the patients had to be rescued in the midst of a hurricane. This morning everything looks at its worst. The crowd of glistening white tents looking so bright and clean in the sunshine is now only a series of bulks of muddy grey, "moist, unpleasant bodies." The spaces between them, usually crowded by soldiers drilling or preparing food, are now quite deserted. No one is to be seen abroad save the sentries or the cooks working here and there at the camp kitchens in a rain that searches everything it reaches. The white scorched surface sand has been washed away, and the dull brown of the deeper layer adds to the desolation. The water sweeps everywhere down the slopes in rivulets that quickly deepen in the sand, or in broad shallows. Across the breastwork the veld is covered with sludgy, greasy mud. The Bengalis cower in their tents, or, if they must attend to their horses, look wizened and shrunken in the cold rain. The sky is without a break. The clouds cover the lowest kopjes round about, and everywhere, instead of men's voices, there is only the slushy sound of a deluge. But we are after all fortunate. It is not precisely home life, nor are our comforts of the drawing-room, but our fighting line has gone through this, and worse, without cover, and has won victories, and we have at least a protecting canvas.

The Irish Hospital Section at Prieska.

I have heard from Dr George Stoker and his section, who have been working at Prieska. They have been with the column under Lord Kitchener, operating against the rebels there. They have had plenty to do. Now they are marching to rejoin us, which I expect will be this week.

Proposed Move to Bloemfontein.

We are promised a new bridge at Norval's Pont on Wednesday; then the congestion here will be relieved, and we shall go to Bloemfontein.

[From a telegram received on April 17th it appears that this intention was carried out, and that the Irish Hospital had been moved to Bloemfontein.]

THE MEDICAL ASPECTS OF THE WAR.

By a South African Campaigner.

XX.

Boer Ambulances.

Dr. Korteweg, Professor of Surgery at Amsterdam, has written to the *Times* of April 3rd calling attention to my letter in the British Medical Journal of March 10th on Boer ambulances. In this I quoted from a telegram published by the *Times* from its St. Petersburg correspondent, stating that the Dutch Committee there had received news from Professor Korteweg in Amsterdam. Dr. Korteweg has already pointed out in the Journal of March 17th that the statements concerning the Boers were erroneously attributed to him, and in contradiction with letters published in the Dutch medical journals. It is unnecessary to point out that whatever errors may have arisen in this matter are due to the St. Petersburg telegram. On again referring to it, however, I confess I do not see any statement contained in it which, from my knowledge of the Boers, I should regard as improbable. It may be admitted that although a Boer is distrustful of a stranger, if he once gets to know a medical man his confidence is soon established. Dr. Korteweg, however, denies the whole of the statements attributed to him, and it is only just that I should frankly accept his repudiation of these statements, and express my regret that I have quoted a telegram in reference to him the accuracy of which he denies.

Cases in the Base Hospitals.

A surgeon in one of the base hospitals near Capetown sends me some interesting notes with regard to the cases under his care. He says that during the week previous to writing they had been receiving cases from Paardeberg.

Among them was one of the C.I.V.'s, who was struck with a Mauser bullet on the outside of the left upper arm, just above the insertion of the

deltoid; the humerus immediately below its surgical neck was splintered, the bullet finally lodging in the axilla, near the costal arches. The patient, it is satisfactory to hear, is doing well. The case is of interest, as showing that even the Mauser bullet, with its enormous velocity, does not invariably penetrate, and in this instance was apparently lodged against the ribs.

He relates another case of a man shot in the prone position in the outer third of the left clavicle. The bullet made an exit posteriorly 2½ inches from the spine, between the twelfth rib and the crest of the ilium on the right side. From this it will be seen that the whole of the thorax and a portion of the abdomen were traversed by the bullet. He says that several cases shot clean through the chest showed no symptoms beyond pleuritic pain and slight hæmoptysis.

As illustrating the small holes made by the Mauser bullet, with scarcely any bruising of surrounding tissue, my correspondent mentions two cases in his wards.

In one of these the first phalanx of the left thumb was pierced by a Mauser bullet, the injury healed, and the thumb remained a perfectly useful one.

Another soldier had the second phalanx of his second right toe pierced, the wound healing without amputation being necessary.

The general administration of the hospital, my correspondent concludes, reflects great credit on the Principal Medical Officer and the R.A.M.C.

Impure Water Supply.

Dr. T. Wilson, who returned recently from South Africa, offers some interesting notes with reference to the water supply:

The impure quality of the water used by our troops in South Africa being mainly responsible for the prevalence of typhoid amongst them, it may be of interest to point out briefly the causes of pollution.

In the first place, the supply not being plentiful on the veld, the camp is pitched on a healthy spot close by a river. This, no doubt, ensures quantity, but not unfortunately quality. Wounded animals make their way to the rivers to drink, with the result that it has not been unusual to find as many as fifty horses during the present campaign in a state of advanced decomposition. Another agent in pollution is the practice of the Boers in burying their men who have fallen in battle. They throw the bodies into the rivers to be carried away by the current. This has the double advantage, from their point of view, of quickly disposing of their dead and of hiding their losses from the enemy. A permanent source, however, of mischief in this direction, and one which, unlike the two factors before mentioned, has no reference to the war, is the habit of the natives of bathing in the rivers and of polluting the water in other ways. When it is borne in mind that soldiers after a long march slake their thirst on the first opportunity without regard to hygienic considerations, the part played by impure water in increasing the mortality of our soldiers can be readily apprehended. Filters, of course, are supplied to the troops, but most of them easily get out of order, often becoming unworkable after a week or so. The Berkfeld filter I have heard much recommended, as it has the advantage of being easily cleaned and exceedingly portable.

THE SPECIAL HOSPITALS.

The Scottish National Red Cross Hospital.

The Scottish National Red Cross Hospital, which has been accepted for service in South Africa, is being provided by the St. Andrew's Ambulance Association, which is incorporated by royal charter, and has branches all over Scotland. The first section of this hospital, which makes provision for 100 beds, is to sail from Southampton in the *Pembroke Castle* on Saturday, April 21st; it will be utilised as a base hospital or a hospital on the lines of communication. The officer in charge appointed by the War Office is Deputy-Surgeon-General Cayley, the late Professor of Medicine at Netley. Professor Henry E. Clark has been appointed Chief Surgeon, and will be assisted by Mr. Duke, Dr. John M. Cowan, and Dr. A S. Boyd will act as physicians, while the junior medical officers are Dr. Aitken and Dr. Garrod. Six nursing sisters have been appointed, and will be under the supervision of Miss Shannon, who has been the night matron in the Western Infirmary, Glasgow; while eighteen medical students from Glasgow University and St. Mungo's College go out as dressers and first-class orderlies. The remainder of the staff, which numbers 60 in all, will be made up of carefully selected civilians.

The hospital will take tortoise tents, having 10 beds in each, and the first section will provide 100 beds. In addition, suitable accommodation is provided for the staff, for cooking, etc., and a special operating tent. The hospital, which has been accepted for service for six months, is equipped with all modern requirements, for example, Roentgen ray apparatus, electric light for operating tent, refrigerator, etc., and will be very complete in all its details. The St. Andrew's Ambulance Association, besides providing the hospital, is to pay the staff and all the expense of the upkeep of the hospital, while the War Office agrees to convey the hospital and staff from Glasgow to South Africa, to provide the usual rations, and to send the hospital home again at the termination of six months or when the services of the hospital and staff are no longer required. It is expected that the second section of the hospital, which will provide 200 additional beds, will be ready to sail early next month.

On April 11th a special service, conducted by the Rev. Dr. McAdam Muir, Principal Story, Principal Marshall Lang, and the Rev. Dr. George Adam Smith, was held in the Glasgow Cathedral. On the same afternoon the staff, tents, and equipment of the hospital were inspected by General Chapman, the General Commanding the Forces in Scotland. In the evening an enthusiastic meeting was held in the Queen's Rooms to give a "send off" to the members of the staff. Addresses were delivered by the Lord Provost of Glasgow, Sir William Gairdner, and others; and the proceedings concluded with the singing of "Auld Lang Syne."

The Langman Hospital.

Mr. John L. Langman has received the following telegram from Lord Roberts from Bloemfontein:

I inspected your hospital here yesterday, and congratulate you heartily on the efficient state in which I found it. Its value to our R.A.M.C. and wounded cannot be overestimated.—Roberts.

The Welsh Hospital.

The Staff of the Welsh Hospital sailed from Southampton in the *Canada* on April 14th.

DEATHS OF OFFICERS, R A M.C.

The late Captain G. S. Walker.

We published in the British Medical Journal of March 10th, page 604, a short obituary notice of Captain George Stanley Walker, R.A.M.C., who died of enteric fever at Ladysmith on February 23rd. Captain Walker's relations have since received a letter from the officer commanding the 2nd Battalion Gordon Highlanders, in the course of which he writes:

My brother officers and I sympathise with you most sincerely, and I assure you we all feel his loss He devoted himself to the care of the battalion, and I am afraid his death is due in a great measure to his sense of duty. He had been unwell for some time, but would continue his work to the last, although now we know he must have been suffering all the time. In action he was the bravest of the brave. Always in front with the firing line, and attending to the wounded under the heaviest fire, and after a fight, though tired and done up, he never rested till all his wounded had been carefully attended to. His memory will always be with us.

A letter has been received also from Lieutenant-Colonel J. A. Coxhead, R.A., in the course of which, after stating that Captain Walker's death was universally deplored, he says:

He literally died in harness, and gave up his life to save others, amongst whom I was one. He was a noble fellow.

Captain Hall Owen, of the Victoria Militia Medical Staff, whose death from enteric fever is reported from Chieveley on April 5th, took the diploma of M.R.C.P.I. in 1883, and that of M.R.C.S.Eng. in the following year. He was a Justice of the Peace for the Central Bailswick, and ex-Mayor of South Melbourne, as well as Honorary Surgeon to the Melbourne Benevolent Asylum.

GENERAL LYTTELTON ON THE WORK OF THE R.A.M.C. IN SOUTH AFRICA.

On March 20th at Sunday River Camp, Elandslaagte, Natal, Major-General the Hon. W. G. Lyttelton, on leaving to assume command of the Fourth Division, bade farewell to the troops of the 4th (Light) Brigade which he had commanded so successfully in the recent operations for the relief of Ladysmith.

Addressing the *personnel* of No. 9 Bearer Company and No. 9 Field Hospital, R.A.M.C., attached to the 4th Brigade, the gallant general said:

Officers, non-commissioned officers, and men of the Royal Army Medical Corps,—On vacating the command of the 4th Brigade, I wish to record my high appreciation of the valuable work done by the R.A.M.C. in the recent campaign. You have been with me during the past four trying months. This is not the first campaign I have served in by a good deal, and I desire to say that, though I have always seen the members of the Medical Department perform their duties meritoriously, in no previous campaign have I seen the work of the R.A.M.C. rise to such a high standard. Not only have you done valuable work in connection with your own Brigade, but, from the reports I have received from senior officers, I understand you have been "maids of all work" wherever medical assist-

ance was required. The grateful thanks of the officers and the men of the Brigade are due to you for the excellent and efficient manner in which you have carried out your duties. Having had you with me from the commencement, I would have liked to have led you to Pretoria; but this is not to be. However, I feel I shall not be far separated from you. And now I wish you farewell.

At the conclusion of his speech three hearty cheers were given by the officers and men of the Royal Army Medical Corps for one of the most popular and distinguished generals in the British army.

It may be remembered that the above-mentioned units who have earned such high praise in South Africa were mobilised at the Royal Infirmary, Dublin, last October, and embarked in the ss. *Servia* at Queenstown for South Africa on November 3rd. On November 29th, at Mooi River, Natal, they joined their (4th) Brigade, which they accompanied in all the subsequent operations of the campaign, including the battles of Colenso, Spion Kop, Vaal Krantz, and the fourteen days' fighting on the Tugela, ending with the brilliant victory at Pieter's Hill and the relief of Ladysmith. They were the first medical units to reach the beleagured city, and took part in the triumphal entry of the relieving army on March 3rd.

NOVA ET VETERA.

MAN'S PLACE IN THE LONDON DISPENSATORY.

In 1678 William Salmon, Professor of Physic, presented the world with a translation of the *London Dispensatory, lately reformed by the Fellows now living, of the Colledge of Physicians: being a Compendious Collection of the choisest Medicaments whether Gallenical or Chymical yet known or in Request.* The work is divided into six books, treating of simple vegetable medicaments, of animals, of minerals, of compounds internal and external, and of the practice of chymistry. All the sections well repay perusal, but the most remarkable is the first chapter of the book "of Animals, their preparations, Virtues and Uses." This chapter treats of man, and the parts are considered as they are taken, (1) from a living body, and (2) from a dead body.

The first item taken from the living body is hair used as a powder, as ashes, as an oil, as a distillation, and as an electuary. Hair cures the jaundice, the simple ashes stop bleeding, and an oil distilled from it with bone, anointed on bald places, causes hair to grow.

The nails in powder or infusion are said to cause vomiting, but they cure dropsies if laid on the navel. Fasting spittle rubbed on oftentimes cures pimples, the stinging of serpents, and the biting of mad dogs. Woman's milk is an emollient made more powerful if a grain or two of white vitriol be dissolved in it.

Menstrua, sanguis menstrualis, taken from virgins, dried, and given inwardly is prevalent against the falling sickness and stone; outwardly applied it cures gout, and worn as an amulet is good against the plague.

A drop or two of the blood of the navel-string being first given to a newborn child in a little breast milk prevents convulsions and all other fits, and very wonderfully revives it almost dead. The secundine calcined and given in southernwood water every day, half an ounce while the moon decreases in light, wonderfully cures the King's evil.

Sperma experience has found good against witchcraft, and some use it to make a magnetic mummy to serve as a philtron to cause love. Stone taken from the kidneys or bladder dissolves and expels the stone and gravel from all parts, and opens obstructions, being given a drachm at a time in powder. Stercus, the dung is emollient, anodyne, and maturative. It ripens plague sores being applied, and dried, powdered, and mixed with honey it cures inflamed wounds and the quinsy. The ashes given two drachms at a time in agues cures them. Occidental civet is made hereof so like the true civet that it shall be difficult to discern the difference.

The urine opens obstructions of the liver, spleen, and gall; is good against the dropsy and jaundice and causeth easy delivery to women in travel. Boy's urine dropt into the ears cures their soreness and opens obstructions there. It is used as spiritus, as a volatile salt, as an essence, as a magisterium or salt, and as an oil. Some say that blood drunk hot cures epilepsies. The owder or ashes of it applied to any flux of blood stops it. The preparations of it are a mummy of blood, a water and oil, a balsamum arthriticum which is of strange force in the gout and an antepileptic spirit of man's blood.

Among the substances derived from the dead body the most important was mummy.

"Mummy" is fivefold: (1) Factitious Pissasphaltum, made of bitumen and pitch. (2) Flesh of a carcass dried by the sun, in the country of the Hammonians between Cyrene and Alexandria, being passengers buried in the quicksands. (3) Ægyptian, a liquor sweating from carcasses embalmed with pissasphaltum. (4) Arabian, a liquor which sweats from carcasses embalmed with myrrh, aloes and balsam. (5) Artificial, which is modern. Of all which the two last are the best, but the Arabian is scarcely to be got; the second and third sorts are sold for it. The artificial is thus made: Take the carcase of a young man (some say red-haired) not dying of a disease, but killed; let it lie 24 hours in clear water in the air, cut the flesh in pieces, to which add powder of myrrh and a little aloes, imbibe it 24 hours in the spirit of wine and turpentine, take it out, hang it up 12 hours, imbibe it again for 24 hours in fresh spirit, then hang up the pieces in a dry air and a shadowy place, so will they dry and not stink.

Various preparations were made from this precious substance. There was first the tincture or extract of mummy, used as a counter-poison. It prevents the plague and resists all manner of infection being taken only to a scruple, and cures being taken to a drachm or two drachms. A treacle was prepared from it. The elixir mumiæ has all the virtues of the tincture, besides which it is more speedy in the cure of the plague.

Balsamum Mumiæ, a sweet-scented red oil which has such piercing qualities that it pierceth all parts, restores wasted limbs, consumptions, hectics, and cures all ulcers and corruptions if gr. iij, v, or vi, be given twice every day in a proper vehicle.

A few other curious formulæ for preparations made from the dead body may be reproduced:

Aqua Divina.—Take the whole carcase of a man violently killed with the intrails, cut it in pieces and mix them, distil it from a retort twice or thrice. It is reputed to have a magnetic power. If to 1 drachm of this water you put a few drops of the blood of a sick person and set them on the fire and then mix, the sick recovers; if not the sick dies. For want of blood take the urine in a larger quantity.

Adeps, Grease, or Fat.—It is emollient, discutient, anodyne, and cosmetic. It is said to fill up the pits after the small-pox.

Man's Bones.—They stop fluxes, astringe, and take away the pains of the gout. They are taken either levigated into a fine powder with water or calcined in a potter's furnace to ashes. By a retort you may distil an oyl from them which is very anodyne; their marrow is of excellent use to cure contracted sinews and members.

The Skull is a specific in the cure of most diseases of the head; the triangular bone in the temples is the most specificial against the epilepsie. The preparations are the magisterium made by dissolving the skull in spirit of vitriol and then precipitating. The galreda paracelsi, the tinctura cranii quercetani, the aqua and oleum cranii humani and the salt of man's skull, which is a perfect cure for the falling sickness, vertigo, lethargy, numbness, and all head diseases. The dose in peony water or other convenient vehicle is from a scruple to half a drachm. There is also the essence of man's skull, and the spiritus cerebri humani a noble antepileptic made from the brain of a young man slain, distilled with misletoe and sack. The oleum cerebri humani has the virtue of the spiritus.

Man's gall, an extract of it with spirit of wine dropt into the ear cures deafness.

Cor hominis, the powder of it drunk cures the epilepsy.

The various ingredients here detailed appear to us horrible, but instead of looking upon those who used them with contempt should we not rather re-echo Harvey's noble maxim—one of the best proofs of the liberality of his mind—"Not to praise or dispraise other anatomists, for all did well; and there was some excuse even for those who are in error." At a time when chemistry was in its earliest infancy some of these preparations of the human tissues might serve as a means for giving salts which could not otherwise be obtained in an isolated form. The act of swallowing in a newborn child might often rouse a latent vitality, and this was held to prove the value of blood. Sperm still acts as a love philtre, and cowdung poultices are not unknown as applications within twenty miles of London. The value of blood drunk hot as a cure for epilepsy lingers in the mind of the public, and science teaches us that powdered blood might stop a flux.

An International Temperance Congress.—The next International Anti-alcohol Congress will be held in Vienna in 1901. An Organising Committee has been formed, with Professor Max Gruber as Chairman. Among the members are representatives of the State and local authorities, the professors of the universities, and the Austrian temperance and abstinence societies. Dr. von Hartel, Minister of Worship and Public Instruction, is to be the Honorary President of the Congress. All communications should be addressed to Dr. Daum, I. Bezirk, Verein gegen Trunksucht, Plankengasse No. 5, Vienna.