4. A many-tailed bandage about 50 cm. square. The tails should be about 6 cm. deep and overlap half of the adjacent ones.

Application of Leg Fixation in Extension of the Supracondylar Collar.

The sections of tarlatan (1, 2, and 3) are dipped in plaster.

The heel-piece is then spread out on the table below the foot, with the tails perpendicular to the axis of the leg. The lower margin of the heel flap is flush with the sole of the foot; the tails will lie just above the level of the ankle.

The tibial band is spread out perpendicular to the leg just below the level of the tibial tubercle.

The side-pieces are then applied. The lower extremity lies flush with the sole of the foot, the upper extremity is incorporated with the supracondylar collar and turned back on itself to reinforce the plaster at the knee level.

Completion of Leg Extension.—While the side-pieces are held in position by an assistant, the tails of the heel-piece are wound firmly around, obliquely (Fig. 7), so as to bind the side-pieces. The tibial band is then wrapped round the leg horizontally, performing a like function above. The many-tailed bandage is then firmly applied over all, so as to mould the plaster on to the bony prominences while the plaster is in course of setting.

AFTER-CARE.

As with all plaster appliances in which pressure over bony parts is exerted, the main difficulty is the avoidance of pressure sores. For this appliance no form of padding is required, but sometimes a flannel lining to the lower part of the supracondylar collar may be used. Sores may appear over (1) the ischium, (2) the condyles, or (3) at the lower margins of the supracondylar collar. Their appearance can be avoided in any of these localities if due care be taken. As a first measure the preliminary hardening of the skin over exposed points by means of friction and the application of spirit is important.

The skin under the ischial saddle can be kept in perfect condition by the regular friction, and introduction of powder, effected by the passage of a "scratcher" of flannel. This consists of a strip of flannel passed between the skin and the plaster in front where there is no pressure. The "scratcher" is powdered, and worked backwards and forwards twice daily round the whole circumference of the ischial saddle. A similar appliance can be used for the supracondylar collar. Additional precautions to be taken at this level are (a) not to squeeze inwards too tightly when the collar is being moulded on to the condyles; (b) to cut away the lower edge of the collar at any place where it tends to dig into the skin. The screws should be left as slack as is safe when the patient is in bed.

LIFE OF THE APPARATUS.

From the point of view of rigidity the collars, if they are set properly, will outlast the period of treatment. They may work too loose if they have been applied to a swollen thigh which decreases rapidly in size. Usually, however, the thigh swells a good deal when the patient first gets up; gradually, as this oedema disappears, the musculature improves, and so the collars maintain their hold. The extension screws may work loose in their bedding if this has not been soundly effected. They can easily be reset on the old collars with fresh H tailpieces. As a general rule, it is desirable to change the ischial collar after four to six weeks' use, if the apparatus is still necessary.

TYPE OF FRACTURES SUITED TO THE APPLIANCE.

Simple Fractures.—Any simple fracture in which long axis extension maintains good alignment may be so treated. Plated fractures come under this category.

Gunshot and other Compound Fractures.—I have chiefly used the apparatus for cases of this kind, and have found it well adapted to fractures in the middle third of the femur. If there is a suppurating wound which would come under the ischial collar the apparatus cannot be used. In the case of compound fractures in the lower third of the femur, and in which the wound would be fouled by the supracondylar collar, the same principle can be applied by replacing the supracondylar collar by a plaster taking its purchase from about the ankle-joint. This involves fixation of the knee.

TIME OF APPLICATION.

The apparatus can be used in simple fractures as early as the eighth day. Its use at such a period involves continuous screw extension and fixation of the knee. In gunshot fractures I have found it most satisfactory when applied six to ten weeks after the injury. In such cases there should be fair union between the fragments in good alignment, and it is only necessary to exert strong screw extension while the patient is up and about. The likelihood of the formation of pressure sores is in this way reduced to a minimum.

WALKING AND CRUTCHES.

The rapidity with which men will walk in this appliance without the aid of crutches or stick depends to a remarkable degree on individual mentality. In general it is wiser not to hurry a man to forsake his crutches. So long as he is taking a fair amount of weight on the injured limb, and moving both the ankle and knee joints, its function will rapidly improve.

SUMMARY.

1. The moral and physical value of early ambulation in cases of fractured femur is great. The shortening of the period of convalescence so produced is at the present time very valuable.
2. The apparatus described can be fitted by any surgeon at a small cost.
3. When union of the fracture is fairly firm this apparatus permits of movement at the knee-joint.
4. The appliance is most easily managed when some union is present, and in general should be applied from six to ten weeks after the injury.

I am indebted to Lieutenant-Colonel S. G. Butler, D.S.O., R.A.M.C., for permission to publish these notes, and to Captain J. N. Fergusson, R.A.M.C.(T.C.) for the preparation of the photographs.

REFERENCES.

- ¹ Hackenbruch, *Muench. med. Woch.*, 1912, lix, p. 1487. ² Delbet and Laman, *Presse médicale*, December 2nd, 1915.

THE DRAINAGE OF SEPTIC KNEE-JOINTS.

BY

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THE very interesting article on the treatment of septic knee-joints by Colonel Andrew Fullerton in the *JOURNAL* of November 25th, 1916, induces me to give some notes of the methods adopted by me for draining the knee-joint.

Having no notes to refer to I can only recall the earlier cases, which impressed me by their frequency, and one recent case I operated upon shortly before going on two months' sick leave.

Septic knees were more common at this hospital in the early days of the war, and in one small ward seven cases were treated by drainage within a few weeks. Six of these recovered, some with good movement and others with a stiff joint. The case that died had a fracture of one thigh and a bullet wound through the other, the latter being very septic; the knee-joint became infected and was drained, but the patient died of septicaemia. At this time there were no conveniences for bacteriological examination nor for electrolysis with chlorine ions.

In a large number of cases of infected knee-joint it is possible to pass a drainage tube through the joint cavity on the inner side without the tube passing between the bones.

The early cases were washed out with 1 in 20 carbolic acid solution. All the tubes were closed by nipping them, except that engaged by the syringe, and the knee-joint fully distended by the disinfectant; the tube nearest the back of the joint was then freed and the disinfectant and pus allowed to escape, the process being repeated until the disinfectant came away free from pus. This treatment will be ineffectual unless the surgeon personally sees that it is carefully and efficiently carried out, and if he does so there should be no danger of "the entrance of microbes other than the original offenders," as suggested by Colonel Fullerton.

In the early Seventies the late Mr. T. Sympton treated cases of pelvic and other deep-seated abscess at the Lincoln County Hospital by a method then called hyperdistension. The abscess was opened by a valvular incision, and the pus

evacuated as far as possible; the cavity was then hyper-distended with a saturated solution of boric acid and again evacuated, the process being repeated until the fluid came away free from pus. I was much impressed by one of his cases (pelvic abscess following on confinement) which was cured in about ten days. I have had many successful cases since in treating deep-seated abscess in this manner, and the method I have described for treating infected knee-joints is only another application of it.

Many other cases of septic knee-joint have been treated at this hospital and cured with more or less stiff joints, and one of my colleagues informs me that he has had very satisfactory results from the same methods.

Lately I washed out the joint with a saturated solution of magnesium sulphate. The patient when operated on (October 19th) had a temperature of 104° F.; this had declined to normal on November 11th; there was one rise to 101° eight days later; the infection was streptococcal. The patient has now a slightly movable joint, which it is hoped will improve under chlorine ions.

I am aware that there are surgeons who claim that a stiff knee is not so useful as an artificial limb—a statement easily made but lacking in proof. The point could only be settled if some one with a useful stiff knee had subsequently to undergo amputation of the thigh owing to an accident.

INTRAVENOUS INJECTIONS OF ANTIMONY IN THE TREATMENT OF MALARIA.

BY

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IN the BRITISH MEDICAL JOURNAL for January 6th, 1917, Rogers described in a preliminary note the disappearance of crescents from the blood following intravenous injections of tartar emetic.

Ross¹ suggested that this work should be followed up at once by careful and long-continued researches by enumerative methods for the purpose of establishing the point with certainty. He indicated that such methods are the only ones which will finally settle the question, because the parasites vary naturally to such a degree from day to day that it is always difficult to distinguish between accidental and therapeutic improvements.

A case of heavy crescent infection being available at the Albert Dock Hospital, London School of Tropical Medicine, the opportunity was taken of giving antimony injections, a careful daily estimation of the crescents being made afterwards. The vitality of the parasites was also tested to determine whether they would flagellate or not after the administration of the drug.

These tests were begun on January 17th, the patient being kept in bed during the course. The accompanying table shows the results at a glance. The method of counting was as follows: Five hundred leucocytes were counted in well spread out films daily, the films always being taken at the same hour—11 a.m.; the crescents noted during these counts were carefully recorded. As the total number of leucocytes per cubic millimetre was low (between 4,500 and 6,000 during the counts), the time expended on getting the 500 in the films was considerable, practically the whole of a large slide having to be gone over. The method is not one of the greatest accuracy, it is true, but it sufficed for the purpose in this instance, as the parasites were so numerous.

A study of the table shows that the antimony had not the slightest effect on the crescents, their number fluctuating up and down quite irrespective of the injections. Six intravenous injections in all were given, beginning with 1 grain and increasing to 2½ grains, the last three consisting of the maximum dose. That the parasites were not dead was proved by the fact that they were alive and active in fresh blood, and proceeded to flagellation in a normal manner. In addition to the crescents a scanty ring infection was also present; again the drug appeared to have no effect upon these.

Date.	Treatment.	Crescents.	Rings.	Leucocytes Counted.	Date.	Treatment.	Crescents.	Rings.	Leucocytes Counted.
1917 Jan 17		162	+	500	1917 Feb. 5	A.T. gr.ijss	49	++	500
" 18	A.T. gr.ij	69	++	500	" 6		42	—	500
" 19		151	—	500	" 7		48	—	500
" 20		28	+	500	" 8		64	—	500
" 21		57	—	500	" 9	Quinine gr.x twice daily;	20	+	500
" 22	A.T. gr.ijss	34	+	500	" 10	liq. arseni- calis m2 t.i.d.	18	—	500
" 23		55	+	500	" 11				
" 24		69	++	500	" 12	Ditto	8	—	500
" 25	A.T. gr.ij	37	—	500	" 13	Ditto	56	—	500
" 26		50	+	500	" 14	Quinine gr.x twice daily;	7	—	500
" 27		47	—	500	" 15	liq. arseni- calis m3 t.i.d.	15	—	500
" 28		30	+	500	" 16		3	—	500
" 29	A.T. gr.ijss	134	+	500	" 17	Ditto	4	—	500
" 30		172	+	500	" 18	Ditto	3	—	500
" 31		60	—	500	" 19	Ditto	36	—	500
Feb. 1	A.T. gr.ijss	52	—	500	" 20	Quinine gr.x twice daily;	10	—	500
" 2		42	—	500	" 21	liq. arseni- calis m4 t.i.d.	7	—	500
" 3		73	—	500	" 22		2	—	500
" 4		26	—	500					

A.T. = Antimonium tartaratum. First dose, January 18th, 3 p.m.; crescent count on that day from film taken 11 a.m., future counts also taken at same hour.

Leucocytes per cubic millimetre scanty, varying from 4,500 to 6,000 during the above counts.

After it was seen that no good was accruing to the patient from the antimony he was put upon quinine and increasing doses of arsenic, and the beneficial results of these are also brought out in the table.

One case does not prove a point, but, granting this, it is difficult to suppose that such injections would sterilize other cases after their complete failure in that here described.

Another point against the drug is Colonel Jackson's case of kala-azar, also mentioned in Ross's letter, which had a relapse of benign tertian malaria after long intravenous antimony treatment.²

It will be interesting to await the experiences of others who may try the drug.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, January 27th, 1917. ² Indian Med. Gazette, December, 1916.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

AN APPARATUS FOR HOT-BATH TREATMENT IN WOUNDS OF THE LIMBS WHILE THE PATIENT IS IN BED.

SINCE hot-bath treatment is nowadays such a popular method of cleaning and combating sepsis in open gunshot wounds, it may be useful to describe a simple apparatus for giving this treatment to a patient in bed, without inconvenience. We employ two what might be termed bags made of indiarubber mackintosh sheeting, one inner and one outer. The inner one takes the form of a cylinder and is slid on up the arm or leg to cover the wound. It is made in such a way that it can be approximated to the skin above and below by means of plain indiarubber bandages; these bandages are only lightly applied. There is a tube of entrance and another of exit.

If we now run in water, with the exit tube closed by a clip, it will be found that, after filling the space between the skin and cylinder, the water will slowly drip out from under the loosely-applied bandages. To catch and collect this dripping water the outer bag is used. It takes the