and are not, but who would gladly avail themselves of artificial visual aid if they knew that "Lieutenant" A. or "Captain" B. was sufficiently a "doctor" to know how to examine their eyes, and if the War Office were willing to pay for the spectacles.

Army authorities are at present faced by two sets of difficulties. (1) Greater demand for good vision in our men by modern conditions of warfare; (2) the old, old recruiting difficulties which I have stated led in 1870 to the visual tests being lowered. These difficulties will probably be overcome by a compromise.

Though unlearned in English or Continental literature on these important subjects, I venture to make the following suggestions:

1. Do not admit more ametropes by still further lowering visual tests unless prepared to correct their vision.

2. The examination of such ametropes by ophthalmic experts (civilian or military), and their vision and correction to be recorded on their medical history sheets. Such action would be necessary not only to treat the "scrimshanking and discharge" stages of a soldier's *folie circulaire*, but to render easy the replacement of broken or lost glasses.

3. Opticians to be officially appointed whose duty it would be to keep an exact record of glasses supplied, to check the regimental data.

4. The distribution of recruits according to their sight to branches of service not necessitating keen vision or otherwise. If the visual tests were lowered, it would be of paramount importance to separate the "hewers of wood and drawers of water" from the soldier who proposes to become a good rifle-man, cavalry man, or artilleryman.

5. To support discipline, and to lessen the responsibility of medical officers by inflicting summary punishment—by court-martial and under the certificate of the ophthalmic surgeon—on soldiers afflicted with *folie circulaire* of above type.

6. To encourage the correction of ametropia by granting spectacles to soldiers free of cost. I never could understand why free spectacles were given to South African invalids conditional on their discharge from the army. I should have thought that a non-discharge was a more rational condition. The War Office grant artificial teeth to men who are likely to become efficient soldiers and who are willing to remain in the army. Why not spectacles?

7. Official encouragement to R.A.M.C. officers to specially qualify themselves in ophthalmic work, such special qualification to be rewarded with corresponding increase of pay.

8. The appointment of civilian consultants in certain military centres or districts to co-operate with the R.A.M.C. officers as occasion demanded or rendered desirable.

9. Special arrangements to be made whereby spectacles lost or broken can be replaced, and for ensuring suitable glasses being always available on occasions of need. This applies specially to men abroad or on active service.

Respecting the recent proposals made for reform of R.A.M.C., my remarks on "specialism" by medical officers of this corps were written before publication of these proposals. I have long advocated this and a closer union of the civil and military branches of our profession. Twelve months ago a special department of the "ear, nose, and throat" was established at my request at the Cambridge Hospital. I have charge of this, and am taking notes for publication of "reflections" on this work in the army.

AMBULATORY TREATMENT OF A RUPTURED TENDO ACHILLIS.*

By J. LYNN THOMAS, C.B., F.R.C.S.,

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A PERSONAL REMINISCENCE OF THE SOUTH AFRICAN CAMPAIGN.

WHILST proceeding to South Africa in advance of the Welsh Hospital, on board the R.M.S. *Tantallon Castle*, I had the misfortune to rupture my right tendo Achillis on March 14th,

*Read before the South Wales and Monmouthshire Branch of the British Medical Association at Merthyr Tydfil.

1900, when hopping on tip-toe during physical drill before breakfast. By a wise provision—unappreciated by the writer until his accident—the hopping stage of the drill is not reached until an amount of strength is used up, which prevents one doing the hop after the fashion of a *première danseuse*. Unfortunately for me, I got on deck when the hopping stage of the drill had been reached, and I joined in, fresh and vigorous, when at the first turn round the deck the breaking strain of the tendon was reached with unexpected suddenness, which rendered the foot utterly helpless. I felt my heel drop on the boards, accompanied by a loud sound like the snap of a broken cello string, and followed by a sudden dull pain and a disagreeable warmth near the heel. Whether the sound was conveyed through the bones, the air, or both, I cannot decide, but the sound was to me very loud indeed. On examination, there was the usual deep gap, admitting easily the ball of my thumb, which is seen after tenotomy of the tendo Achillis.

The steward brought me a bucketful of seawater—the traveller's panacea for strains and sprains—into which I plunged my maimed limb, while I experienced a melancholy awakening of the surgical traditions of treatment of similar lesions. The first picture which greatly worried me was that of the stereotyped extended foot in a slipper with pointed toe, and a heel-strap attached to a collar, fixed to the thigh above the bent knee; it presents itself in surgical textbooks of many countries with a persistence that for the moment quite haunted me, for, being a civilian surgeon *en route* to a great war where plantigrade progression would probably be a necessity, I concluded that such treatment was fundamentally wrong. The next and more modern picture was that of a leg and foot in plaster-of-paris, with its owner using a pair of walking-sticks, which would effectually doom him to a rest in Capetown; this method of treatment was also unacceptable to me; whilst the last picture of all was introduced to me by a brother surgeon on board in the up-to-date fashion: "Let me cut down and tie the ends together; it is the very best possible method." I must confess I did not fully appreciate the value of the advice, for I immediately thought of all sorts of possible pyogenic tragedies.

I decided very soon to lay aside the usual methods of treatment, my guiding principle being *che va piano va sano, che va sano va lontano*. The treatment I adopted until I arrived in Capetown was massage of the leg night and morning, and the application of cold-water bandages. I managed to hobble along fairly well by rotating outwards the whole of my lower limb, and using my adductors to advance the foot. By this method one can with care use the foot as an inanimate prop without extending or flexing the ankle-joint. After arriving in Capetown, and trying a variety of splints for restraining ankle movements, I hit upon the splint which is represented in the diagram, and which I got from Mayer and Meltzer's

local branch. It is an aluminium spatula moulded to the shape of the bend of the ankle; it was pushed into a very thick indiarubber tubing, which acted not only as padding, but also kept the splint in its place by preventing the aluminium moving downwards under the boot lace. It is necessary for the comfort of the patient to carry out the details illustrated in the diagram, one of these being that the boot lace should be placed right round the lower part of the

splint, because I found that if the boot lace was all in front of the splint the pressure on the back of the foot became intolerable (the dotted lines = bootlace behind the splint); massage was also kept up. The advantages of such a splint are its simplicity and its efficiency, the patient being allowed to walk about without any fear of the ankle getting accidentally flexed to a degree which would disturb the provisional callus. At the end of May my late esteemed colleague, Professor Tom Jones, advised me to do without the splint. The splint answered the purpose for which it was intended; it permitted me to go and see the surgical cases at the hospitals near Capetown, and also to proceed to Bloemfontein, the only drawback being that two callosities formed, one on the instep, and the other on the lower part of the leg, where the ends of the splint checked accidental movements. The above treatment resulted in a very excellent union of the tendon, for I have been able to do my usual amount of walking and dancing without the slightest inconvenience for the last twelve months.

THE VALUE OF ROENTGEN PHOTOGRAPHS IN RUPTURED TENDONS.

By means of Roentgen photographs I have been able to measure the distance between the broken ends of the tendon as well as to observe the gradual conversion of the temporary transparent callus into the opacity of the permanent one, which apparently coincides in its resistance to the passage of x rays with that of normal tendon. At the present time my right tendo Achillis is 1 cm. thicker and wider than the left, and will, I hope, continue to be so, for I think that Nature in cases treated in the above manner provides a greater amount of uniting material than she would have done if the ruptured tendon had either been sutured or the leg encased in a splint for any length of time. I have treated two cases of tenotomy of the tendo Achillis since my return home in the same manner as I treated myself, and the result has been very satisfactory. Tendons vary very much in form and size in different individuals, and the character of the tendons undoubtedly sometimes determines the nature of an accident. My own tendons are very long and thin.

I had a case at the infirmary at the beginning of last summer where a woman was playing with some children in a field, and in trying to save herself from falling forward fractured the bony attachment of the tendo Achillis to the os calcis, carrying up a big piece of the bone, which had to be exposed, replaced, and fixed by sutures. In her case the tendons were short and very thick.

I think that treatment by early massage and walking in cases of ruptured tendo Achillis brings about a stronger union than is attained either by immediate suturing or the fixation of the limb by splints, because the call to provide sufficient reparative callus to bind the ruptured ends of tendons is much greater during movement in the dependent position than it is during rest in an elevated or in a fixed position. The great difference in the quantity of reparative material in the two conditions is well shown by study of human and veterinary surgery of broken bones and tendons.

TWO ADDITIONAL SIGNS OF RUPTURED TENDO ACHILLIS.

In addition to the ordinary symptoms of ruptured tendo Achillis hitherto described in textbooks, I think that the following two may be added. The first is the obvious one of studying Roentgen photographs of the part involved. The relative shadows of bone, muscle, tendon, and skin with subcutaneous tissues taken by means of Roentgen tubes of suitable intensity are already well known, and it is easy by this method to determine the exact size and other characters of the gap, and to guess the causation of the breach in the tendon. In tenotomy the ends of the tendo Achillis are shown by a white or transparent gap with well-defined, sharp and straight boundaries, whilst in the ruptured tendon the ends are more irregular in outline and fibrillated in appearance.

The second symptom depends upon the character of the bruise that follows such lesions: (1) Ankle sprains, (2) Pott's fracture, (3) rupture of the plantaris muscle near its insertion; (4) ruptured fibres of the soleus in its lower part, and (5) rupture of the tendo Achillis, are accompanied by surface markings of extravasated blood after a few days of the injury,

which bear special characteristic forms according to the particular lesion existing. In (1) the bruises are most intense along the lower borders of the two malleoli, and later on become general around the ankle; in (2) it is most intense in the neighbourhood of the inner malleolus; in (3) it becomes most intense between the tibial malleolus and the os calcis, whilst later on it is evident on the outer aspect of the tendo Achillis; in (4) there is usually seen bilateral discoloration on each side of the tendo Achillis, and their upper limits become connected by a broad band of mixed colours giving an $\cap$ shape to the bruise; whilst (5) shows bilateral discoloration on each side of the tendo Achillis running downwards below both malleoli, and is joined at the level of the malleoli or the seat of the ruptured tendon, by a transverse band, thus giving to the bruise its characteristic H shape, which I think is pathognomonic of a breach in the tendo Achillis. When we see two symmetrical "black eyes," without indication of the cause, we generally conclude it is due to a blow or injury to the bridge of the nose; likewise I think an H-shaped bruise at the heel is due to rupture or division of the tendo Achillis.

BULLET WOUND OF THE MOTOR REGION OF THE BRAIN: BULLET RETAINED: SUCCESSFUL EXTRACTION.

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The velocity of the modern small-bore bullet accounts for comparative infrequency of their lodgment in the body. When this does occur it is due either to an extreme range or to the bullet being a ricochet, and having thus lost a considerable proportion of its initial velocity. These remarks do not apply to the expanding variety, which have been so frequently used during the present war, and which often fragment on impact.

In wounds of the head—a class of wound which undoubtedly forms a large percentage of those killed outright in an engagement—the bullet usually passes, as in other regions, completely through the skull, causing more or less extensive fissuring of the bones. If we exclude these cases which are killed outright, and take into consideration the conditions described above, it will be seen that the number of cases of retention of the bullet in the skull is actually very small.

In considering the treatment of such cases the first question that arises, where the bullet is causing symptoms rendering its removal desirable, is, Can its removal be successfully effected? This depends on the position it occupies. Undoubtedly, when the bullet lies in the base of the skull, its removal may be impossible, so that this still further reduces the number of successful extractions. For these reasons it appears desirable to place the following case on record:

Lieutenant — arrived at the Imperial Yeomanry Hospital, Pretoria, August 5th, 1901, having been wounded in action five days previously.

History.—The wound of entrance was situated over the anterior part of the right parietal region, about two inches from the middle line; it was an irregular slit in the scalp three-quarters of an inch long, and gaping to the extent of one third of an inch. A small quantity of blood-stained serous fluid escaped. Behind the wound was a large oval tense swelling beneath the scalp, and some irregularity of the bone could be detected. During the interval of five days before the patient came under my observation the head had been dressed antiseptically. When the patient was hit he was sitting with his elbows on his knees, having just fired his carbine; he was stunned, but not rendered completely unconscious.

Condition on Admission.—Severe frontal headache was complained of; the mental condition was quite clear; the pulse was 50, regular, full, and incompressible; the respiration slow, sighing, and irregular; temperature 99.4°. The pupils were equal, moderately dilated, and reacted but sluggishly to light. There was partial paralysis of the upper part of the left side of the face, and the angle of the mouth was completely paralysed, except and the left arm below the shoulder was also completely paralysed, except for slight movement of extension at the elbow. There was a subjective sensation of numbness in the forearm and hand, and blunting of tactile sensation.

Treatment.—The head was at once shaved and disinfected, and skiagraphs were taken with exposures of fourteen and sixteen minutes respectively for the lateral and antero-posterior views; unfortunately they did not give the least indication as to the position of the bullet. In spite of the failure to locate the bullet, I decided not to delay the operation for the relief of the fracture, owing to the risk of the symptoms of compression which existed increasing, and, while removing the embedded splinters of bone, I could explore the wound in the hope of finding the bullet. In this I was successful; had I failed, I should have relieved the