In the earlier experiments (three in number) the lymphocytes increased somewhat after the onset of rickets, while in the later ones (five in number) the polymorphs underwent the increase, but in two of these latter cases a bronchopneumonia was discovered after death, and probably accounted for the leucocytosis.

Thus experimental rickets is not necessarily accompanied by any anaemia, and when anaemia does appear it is, as a rule, of minor degree, and may frequently be accounted for by some complication. There may or may not be a leucocytosis, and this also when it occurs may be the result of some complication. It can at least be truly said that in the blood of animals suffering from rickets there is no marked pathological change and absolutely nothing characteristic.

It is thus seen that these experimental results are in entire accordance with those obtained in the cases of spontaneous rickets, and which I have briefly reviewed above. Of 30 children suffering from active and uncomplicated rickets, only 9 presented anaemia, in not one of which was the number of red cells less than 4,100,000 c.mm. As a rule, however, the blood estimations were abnormally high. Nucleated red cells were exceedingly rare. In only 2 of the cases was there an unequivocal leucocytosis, 9 presented a leucopenia, and 19 a slight increase in the number of white cells.

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THE TREATMENT OF SLEEPING SICKNESS:

A SUGGESTION.

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I HAVE read with much interest the account of the discussion on cerebro-spinal meningitis at the Sheffield meeting last August. More especially have I noticed the results obtained by Drs. McKenzie and Martin by their method of introducing locally by spinal puncture a highly immune serum which they obtained from the blood of patients who had recently recovered from the disease or, as in two successful acute cases, who were still running a course. These latter were injected with their own serum taken on the sixth and seventh day of their illness respectively.

It has occurred to me that a somewhat similar method of serum-therapy might be tried in cases of trypanosomiasis and sleeping sickness.

Although cerebro-spinal fever and trypanosomiasis differ very markedly—the one being a bacterial, the other a protozoal disease—yet there are certain points of resemblance between them. In both the organism producing the disease is found in the blood and in the cerebro-spinal fluid; at least, this is so in advanced cases of sleeping sickness. In both there is that "lymphatism" described by Westenhoeffer and Symmers in cerebro-spinal fever; and in both the mesenteric glands may show marked hyperaemia and haemorrhage. In both also the final stress of the disease falls on the cerebro-spinal system, and, though the one is an acute, the other a chronic disease, cerebro-spinal fever may run a very chronic course, producing an extreme marasmus which cannot be surpassed even in the closing scenes of typical sleeping sickness. At the same time this resemblance is of minor importance. The question is, If in sleeping sickness the cerebro-spinal canal is a *locus minimae resistentiae*, does the cerebro-spinal fluid show a marked lack of trypanocidal substances? So far as I can ascertain, this matter has not been fully investigated. We know that the blood of patients suffering from trypanosomiasis possesses trypanocidal bodies, and blood serum has been used therapeutically both by subcutaneous and intravenous injection. Why should it not be tried intraspinally?

In the past great difficulty has been experienced in attacking the trypanosomes present in the cerebro-spinal canal, and Kopke has made special efforts to overcome the difficulty when treating patients with atoxyl and other chemical substances. It is true that comparatively few cases of human trypanosomiasis recover, but a suitable serum might be obtained from the blood of patients subjected in the first instance to chemo-therapy. A combined treatment might prove useful, attacking the trypanosomes in the blood by some of the more promising of our present drugs, and attacking those in the cerebro-spinal fluid by performing lumbar puncture and injecting the patient's own serum, or the serum from a case which is improving, obtained by defibrinating and centrifuging the blood. The latest work on the cerebro-spinal fluid in sleeping sickness is that by Broden and Rodhain, but they do not approach the subject from this aspect. The cellular content of the fluid seems to vary, and Nattan-Larrier has reported a very severe case with cerebro-spinal symptoms in which the fluid was very poor in cellular elements. This may point to the canal being a *locus minimae resistentiae*, to employ once more the phraseology of Drs. McKenzie and Martin.

It would seem that, so far as the cellular contents go, the fluid in human trypanosomiasis may approximate to the conditions found in cerebro-spinal fever, a fact which is rather in favour of adopting the line of treatment indicated. I admit it is merely a suggestion, and one possibly based on none too stable a foundation; but in the present state of our knowledge, everything likely to prove beneficial should be tried in cases of sleeping sickness. I am sending a copy of this note to Sir David Bruce in Uganda for his consideration, and I propose to carry out experimental work in this direction here as soon as possible.

If the idea has been voiced beforehand, I can only plead the difficulty of getting at the full literature on the subject, and apologize for having, as one may say, "carried coals to Newcastle."

INJURY TO THE VESSELS IN DISLOCATION OF THE SHOULDER.

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THIS short account of a case of injury to the axillary artery and vein possesses considerable interest, serious injury to the larger vessels of the axilla in ordinary simple dislocation of the shoulder-joint being fortunately rare. When the vessels are torn local signs vary a good deal. In the less common variety a swelling appears a few days or weeks after the injury, and increases rapidly with pulsation; in the second kind a diffused fluctuating swelling forms immediately or within a few hours, without bruit or pulsation, and reaches a large size, pushing forward the pectoral muscles. If this tumour pulsates, the diagnosis of a ruptured artery may be made; if in addition the radial pulse is present, it is extremely probable that the injured vessel is not the main artery; beyond this it is not possible to go (Stimson).

E. M., a stout woman of 70 years of age, was admitted to St. Thomas's Hospital on November 26th, 1908. She stated that on the day before admission she had fallen down and hurt her left shoulder; previously she had been in good health. When examined in the casualty department, it was discovered that she had sustained a subcoracoid dislocation of the shoulder. This was reduced by Kocher's method without anaesthetic. Immediately after reduction, a swelling appeared in the axilla, which increased somewhat rapidly in size; it was also noticed that the radial pulse was absent on that side. When seen in the ward on the same evening, 9 p.m., the swelling in the axilla was said to be larger, and the left radial beat was still absent. She was suffering from shock; the right pulse was small and rapid, 124, and the temperature subnormal. There was, however, no proof that the swelling was rapidly increasing. On the following day the patient was placed under an anaesthetic and the axilla opened, both pectoral muscles being divided. A large tear in the axillary vein was found under the lower border of the pectoralis minor muscle. No wound was present in the artery, but all pulsation had ceased at a

point corresponding with the opening in the vein. The wall of the vein appeared thin, and the tear extended almost across it, so that no attempt to suture it would have been of any use. Ligatures were applied above and below the opening, and the axilla cleared of clot. The wound was closed with silk sutures, the muscles being reunited.

It was considered that in the patient's then condition, an amputation through the arm high up would have proved fatal, and that the better course was to wait until she had recovered from the shock, and there was some indication of the extent of the gangrene which was inevitable.

By December 8th a line of demarcation had formed below the elbow, the hand and forearm being dry and shrivelled; and on this date circular amputation of the arm was performed through the middle of the humerus. No Esmarch's bandage was applied and the only vessel requiring ligature was the superior profunda artery. She did not rally well after this operation, and on December 20th she complained of much pain in the right leg, which was colder than the left and tender to the touch. There was also considerable oedema of the left leg. Dry gangrene of the right leg gradually developed and spread up to the knee.

A similar condition began on the left side, but did not extend.

She suffered much pain in the right leg, and for several days before January 26th, 1909, when she died, it was necessary to give her morphine constantly to relieve it.

At the necropsy there was thrombosis of the popliteal vessels on the right side, and considerable atheroma of the arteries generally. The kidneys were contracted and granular. The left axillary artery was thrombosed, but the coats were not ruptured.

This case is important from a medico-legal aspect, as it shows the extent of the damage which may be inflicted by the dislocated head of the humerus in a patient with atheromatous arteries. There was here no question of injury by the house-surgeon during reduction, and the method of manipulation used was that of Kocher, which is regarded by Stimson¹ as the method of all others best calculated to avoid any risk of injury to the main vessels during the process of reduction. No anaesthetic was used nor was the reduction difficult. In the series of cases collected by Stimson, 44 in number, in only 4 had the axillary vein given way; in the remainder it was the artery or one of its branches. The formation of a thrombus in the axillary artery, with or without injury to the vein, had not apparently been recorded in surgical literature.

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SURGICAL CONSIDERATIONS CONNECTED WITH THE ANATOMY OF THE MAXILLARY SINUS.

By A. S. UNDERWOOD, M.R.C.S.Eng., L.D.S.

SINCE the publication of my results in this direction last autumn¹ I have had opportunities of greatly extending those observations. The examination of a very large number of skulls of very varying races and of individuals of every age has left no doubt whatever in my mind that the normal relation of the antral floor to the roots of the teeth is what I then described.

The accompanying figure shows one important fact which has some bearing upon the value of transillumination as a means of diagnosis. If the apices of the roots of the cheek teeth terminated below the antral floor or even protruded a little way into it, transillumination might show a darkness where a small amount of pus was collected in one of the basins between two septa; but if the roots of the molar teeth are embedded in the walls of the cavity, the buccal roots in the outer wall and the palatine root in the inner wall, the thickening of these regions would entirely prevent any transillumination, and the deep pocket of the antral floor descending between these roots might contain things quite undemonstrable by transillumination.

An x-ray photograph, on the other hand, shows such a condition fairly clearly. I have a photograph before me now of a right and left antrum—the right quite clear, the left obviously obscured in relation to the roots of a second or third molar. This left antrum had been pronounced quite normal after transillumination by two authorities.

The next point I wish to dwell upon is the fact that the third and second and first molars in order are most commonly in relation to the sinus, the third molar invariably. Further, the cavity extends a little behind the third molar roots. In the case alluded to above, all the teeth in front of the second molar had been sacrificed as far as and including the lateral, but the second and third molars had been left; their removal later produced a marked result.

I do not wish to suggest that teeth are very often the cause of antral trouble, I do not think they are; but when they are, the third, second, and first molars should be suspected in order, for the third molar is by far the most common offender.

The third point of surgical interest is that the bony septa which divide the part of the sinus embraced by the roots of the third molar from the part in relation with the second molar is generally a simple septum of bone, whereas the septa which are in relation to the front portion of the

cavity are very often traversed at their upper edge by canals in the bone, sometimes closed, sometimes partially open, which convey nerves and vessels across the cavity. I believe that surgeons who are in the habit of doing radical operations on the sinus from a large opening in front (Caldwell-Luc) do occasionally see nervous symptoms ensue consequent upon the breaking down of these septa; if so, these canals, which have not, as far as I know, been described before, may afford a clue to the cause.

The fourth point is that in very rare instances the whole of the third molar region of the sinus is entirely shut off from the rest of the sinus except for an insignificant hole very high up on the nasal side. I have only observed three such cases in the dried skull, but such a condition would in life be very misleading since it looks absolutely like the posterior wall of the sinus, while at the same time there may be a large pus-filled cavity behind it.

I have met with two cases in which the ethmoidal cells extended across the upper third of the maxillary sinus so as entirely to shut off a cavity above it, a cavity which looked at first sight like an attic chamber to the sinus itself.

REFERENCE.
¹ *BRITISH MEDICAL JOURNAL*, 1908, vol. ii, p. 463.

THE newly-founded German Infant Protection Association will hold its first annual meeting at Dresden on June 19th, at the same time as the first congress for the protection of nurslings.

ON the initiative of the Belgian Minister for Foreign Affairs, six lazarettos for patients suffering from sleeping sickness have been established in the Congo State. They will be under the direction of Belgian medical men.