Should a blood count be made, the combination may be present of enlarged cervical and other lymphatic glands, enlarged liver and spleen, together with a certain degree of leucocytosis and a greatly increased percentage of lymphocytes. Such a group of phenomena was actually present in one of our cases, and naturally suggested the possibility of acute leukaemia. It is not uncommon in the early stages of acute leukaemia, especially the lymphoid type, for the leucocytes to be only slightly or not at all increased in number. It was noteworthy that the severe symptoms associated with acute leukaemia were entirely absent. The general condition was good, the mouth was clean (oral sepsis is practically invariable in acute leukaemia), there was no vomiting, no purpura and no haemorrhages. Further, the degree of anaemia was very slight, and the stained red cells were normal, neither nucleated cells nor abnormal forms of any type being present, nor were any abnormal leucocytes recognized.

It is almost inconceivable that acute leukaemia could produce such a picture. It was our opinion from the first that this case was glandular fever, but as neither of us was aware of having seen an instance previously, and as we could find no information on the condition of the blood we hesitated to give a good prognosis for some days. There can be little doubt that similar cases sometimes have been regarded in the past as acute lymphoid leukaemia and probably have been recorded as cures. Many of those who have had much experience in diseases of the blood will be able to recall such events. It is well known that marked lymphocytosis also occurs in whooping-cough.

The distinction of glandular fever from acute cervical adenitis secondary to septic infection may be difficult, but there are numerous points of difference which, taken together, should lead to a correct diagnosis. Attention may be directed to the absence of septic foci in the fauces, scalp, ear and elsewhere in glandular fever, to the site of the main glandular enlargement, to the freedom of the skin and subcutaneous tissues, to the rapidity of diminution of the cervical glands and of the fall of temperature, to the rarity of suppuration, and also to the good general condition which may be combined with general glandular enlargement, a palpable spleen and a very high percentage of lymphocytes. The diagnosis from acute tuberculous adenitis might, presumably, have to await the progress of the case.

From scarlet fever and other exanthemata glandular fever is distinguishable by the large size of the cervical swelling, by the absence of changes in the tonsils and fauces, and of toxic symptoms, and by the absence of rash.

TREATMENT.

In the acute stages only symptomatic treatment is necessary. If the cervical glands are painful, compresses, hot or cold, may be applied, or glycerin of belladonna. Constipation should be treated by simple remedies, and there is no indication for the drastic methods recommended in the past.

As convalescence is often prolonged, as some degree of anaemia may develop and a poor state of health may persist for several months, care must be taken, especially with delicate children, and tonics of iron and cod-liver oil and malt should be administered. There is no reason to believe that nephritis becomes chronic, but our knowledge of this complication at present is scanty, and it is advisable to treat it with the same care as an ordinary nephritis.

Glandular fever must be regarded as infectious, and patients should be isolated. A period of fourteen days may be suggested for isolation and a similar period for quarantine.

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ON UNUNITED FRACTURES.

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A FRACTURE which shows no evidence of bony union at the end of twelve months may be regarded as a case of non-union. To treat any disorder efficiently it is necessary to obtain a clear idea of the condition to be remedied and its cause, for the treatment will largely depend upon the removal of the cause.

The Condition to be Remedied.

Normal bone, like all other tissues, is constantly undergoing a steady process of absorption and reformation, the resulting structure accommodating itself to the function to be performed. The inflammatory process of bone is modified by the vessels being enclosed in rigid channels. This delays the formation of granulation tissue and also the removal of damaged tissues. To overcome this disability Nature appears to have provided a special mechanism for absorption—namely, osteoclastic. It would appear that the same processes which stimulate the osteoclastic element very often coincidentally stimulate the bone-forming process—that is, osteoblastic—into activity. Bone is only a specialized type of connective tissue, and osteoblasts in early stages are indistinguishable from fibroblasts; it is not surprising that fibrous union is not uncommon. It is well known that the pituitary and also thyroid gland secretions have an important influence upon bone formation. Pituitary secretion particularly produces a hypertrophy of interstitial growth of bone.

The chief features noted on examination of the ununited fractures are: atrophy of the bone; loss of vascular supply; sclerosis of surrounding soft tissues and the bone ends.

Causes of Non-union.

The causes of non-union may be conveniently divided into two main groups.

Group I.

- Some upset between the osteoclastic and osteoblastic elements possibly due to derangement or abnormal internal secretions.
- Disuse.
- Defective blood supply.

Group II.

- (a) Non-apposition of fractured ends from various causes—for example, interposition of soft structures; over-extension with weights; loss of bone.
 (b) Movement between apposed ends.
 (c) Prolonged severe infection.

With reference to Group I: Comparatively little is known about (a), but pituitary extract is certainly worth a trial; (b) is an important factor, and everything possible should be done to encourage use consistent with prevention of movements at the site of fracture. It is here that massage plays an important part. As regards (c) the blood supply may be injured originally or later cut off by formation of fibrous tissue, and either of these conditions certainly leads to very delayed union.

Under Group II are classed those causes of non-union which may be called lack of opportunity. The non-apposition of fractured ends is, I think, by far the greatest cause of non-union, and this is, in the great majority of cases, produced by the interposition of some soft structure.

The practice, as was advocated by Leriche, of wholesale removal of all bony fragments in compound comminuted fractures is to be condemned.

Movements between the fractured ends is, I believe, another very common cause of non-union or delayed union, and I venture to state that far more damage has been done by neglect of really adequate splinting than good has accrued by the much vaunted early movements, which have often been instituted regardless of all other considerations.

Treatment.

Due regard must be paid to the general condition of the patient. Inducing the patient to drink large quantities of milk and the giving of calcium salts I believe to have no beneficial effects. Doses of anterior lobe of pituitary, 10 grains daily, by mouth, of fresh gland, or subcutaneous injections of extract of anterior lobe, are well worth a trial, especially in those cases of delayed union which are particularly common in the tibia. During the administration of pituitary the urine must be examined for sugar, and the administration stopped or dose reduced if glycosuria becomes marked. I have not as yet got sufficient data to make any positive statements on the influence of pituitary extract.

The most important part of the treatment will be that directed to the local condition. Here massage and electrical treatment are important to improve and maintain nutrition and keep all the surrounding structures in good condition. Movement and use should be encouraged whenever possible—for example, the wrist and hand in cases of ununited humerus. Where infection is still present this must be cleared up, and an interval of at least three months allowed after healing; during this time special attention should be paid to all joints and soft structures, and use of the whole part encouraged, a temporary splint or support being used the while to allow of maximum use. Deformities should be corrected where present.

This delay for the clearing up of slightly infected cases is not always a necessity; it depends upon the type of operation contemplated. I have treated several cases of non-union of humerus in which there has been a sinus, and obtained excellent results by a step operation or dovetailing and providing drainage.

It is sometimes desirable to perform two operations. At the first scar tissue is excised and the sclerosed ends of bone removed; the wound is then completely sutured and the main operation done a month later. This preliminary operation is the more indicated in those cases where prolonged infection has been present and a bone graft is contemplated, for it will serve not only the purpose of eliminating unhealthy tissue, but also as an indicator that infection is absent.

Injured nerves are best dealt with after union has taken place and proper treatment can be devoted to the part; it is seldom possible adequately to treat the two conditions concurrently. Of course, nerves merely caught in between the bone ends and adherent must be freed, but, on the whole, I prefer to interfere with the nerve as little as possible at the time of operating on the fracture.

The operation consists in (1) attaining apposition; (2) retaining apposition without possibility of movement between the ends.

The fractured ends are exposed by the most convenient route consistent with minimum injury to muscles, nerves, and vessels. The ends are then freed from all fibrous tissue. Most or all of the sclerosed bone is removed and several holes made with a fine drill. The method of actually attaining apposition will depend upon the bone and the condition of the bone ends—for example, 3 in. shortening of a humerus is a trifling matter causing little disability, but it would be a most crippling

deformity in a tibia. The methods employed are (1) the "slot or dovetailing" method, (2) the "step" method, (3) the sliding bone graft, and (4) bone transplantation, the slot being filled with an accurately fitting piece of bone cut from some other bone, usually the tibia.

The last is the most successful type of bone transplantation to use. Intramedullary pegs of bone, where they are used to bridge a gap, are prone to fracture after a period of time. Sometimes it may be desirable to transplant a whole piece of bone—for example, a piece of fibula. Speed is of importance directly bone is exposed, as it dries very quickly, and to prevent this the parts must be kept bathed with warm normal saline. In every case the ends are securely bound together by drilling holes and using thick thirty-day chromic catgut. When this has been done quite good stability is obtained, and the operation cannot be regarded as satisfactory unless this is so, particularly in cases of bone graft.

It is to be noted that many patients have a rise of temperature for a few days after the operation, but this is not to be taken as an indication for opening up the wound unless the rise of temperature is maintained. In a few cases where there is extensive scarring, the skin may slough, and this condition is best treated with spirit dressings, thereby the necrosed area is kept sterile and in a short time an aseptic scab will be formed without infection of the deeper tissues of the wound.

The whole limb is then put up in plaster, paying particular attention to fixation of the joint above and below. On no account should plates, wires, screws or other non-absorbable substances be used—they are unnecessary and almost without exception injurious. A radiogram, through the plaster, may be taken in a day or so, to see that all is well.

In cases where dovetailing or step operation has been performed the plaster can be removed at the end of six to eight weeks and a radiogram taken, after which the plaster is reapplied. It is usual to find that there is sufficient union to permit of limited movements being instituted in one of the joints. At the end of three months the plaster can be replaced with a detachable support, applied to afford protection from severe strains, but allowing of free movements of all joints. During this period the patient is encouraged to use the limb, and massage and electrical treatment is applied.

After a bone graft or transplantation, it is wise not to remove the plaster before the end of three months, and it should then be reapplied for another three months and a protective splint used for a further period. The time in plaster will depend upon the condition found in the radiogram.

The length of time during which a bone has been ununited seems to have little influence upon the ultimate prognosis, and a period of years of non-union should not deter one from operating with a reasonable certainty of a good result.

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THE TREATMENT OF HAEMORRHOIDS BY ELECTROLYSIS.

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In the earlier part of 1914 I read a paper at the Royal Society of Medicine on the treatment of haemorrhoids by electrolysis, and I referred there to the very satisfactory results which I had obtained by this method. During a great portion of the four and a half years of the war, which I spent in Boulogne, I had many opportunities of carrying out this treatment, and the more I see of its results the more convinced I am that, in suitable cases, it is the method of election for this very troublesome complaint. For the sake of convenience haemorrhoids may be divided into three classes:

1. *External*, which occur at the mucocutaneous margin of the anus, and are due to varicosity of the inferior haemorrhoidal branches. These as a rule give no trouble unless they become