reaction. The most important investigations in this field are associated with the names of Mantoux and Lemaire and Grunberg; Nothmann and, first and foremost, Hamburger and Monti have elaborated Pirquet's test by the subcutaneous depot device. All these investigators have found the incidence of tuberculous infection in children far higher than others who have worked with the cutaneous test.

This observation is of the greatest importance, not only because it shows us that the technique of the tuberculin test requires improvement, but also just as much because it shows us that the allergy of children who have been infected by tuberculosis varies greatly. We are faced with the fact that we do not yet know the laws governing the body's protective forces against tuberculosis, whether these be constitutional characteristics or not, and we do not know how far allergic variations depend on the virulence and quantity of the infecting material. One of the most important tasks of the future is to elucidate the nature of the differences between Pirquet's and Mantoux's tuberculin reactions. If opportunities could be provided for following the fate of children through a long series of years, testing their tuberculin sensitiveness by reliable methods, and simultaneously observing any clinical manifestation to which infection gave rise; and if the ultimate fate of these persons could be included in these observations, a sure foundation would be laid on which we could build up our knowledge of the genesis of phthisis in childhood. This research could best be carried out in small, stationary communities easy to supervise.

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THE TREATMENT OF OSTEO-ARTICULAR TUBERCULOSIS.

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THE first fact to note is that, as Tubby said in 1912: "Tuberculous joint disease is arthritis occurring in a tuberculous patient, and is not merely a joint affection." Long ago Lannelongue's idea of the *tuberculome*, of the growth of tuberculous elements outwards into surrounding tissues, like the invading march of a neoplasm, led to endeavours at radical operative removal of the focus. Poor orthopaedic results, and a high mortality, ensued. In the words of Calot: "The great surgeons, who by their so-called radical operations undertake to remove the whole of the trouble, will succeed in only one thing; they will remove everything—the patient." This radical treatment was followed by modified operative procedures, such as attempted extirpation of easily accessible disease, and opening of abscesses. Here again there were drawbacks, in the shape of mutilation-deformity, and the mobilisation of the disease. In my small experience of operation I have seen five astragalectomies closely followed by fatal meningitis. We owe to Menard, Calot and Calvé in France, and in this country to Sir Henry Gauvain, the modern con-

servative method, which, in spite of its name, has nevertheless an active character.

Conservative treatment is both general and local. General measures are in the main those adopted against other forms of tubercle, with one or two special details. Thus heliotherapy is undoubtedly a powerful adjuvant, though in Britain its scope is often limited. We need to treat our patients at the seaside, or in the country on a southern slope, with low rainfall, porous soil, clear atmosphere, and equable temperature. Wind is no disadvantage. A locality where tuberculosis is not common is also advisable. For example, Ferrier has maintained that in France tuberculosis is most frequent where the drinking water contains calcium and magnesium sulphates, rarest where, as for instance at well-known resorts like Davos and Berek-sur-mer, calcium carbonate is found in quantity.

Local treatment has to be considered under the three headings: cure of the local lesion, prevention or correction of deformity, treatment of complications like abscess or sinus formation. The first aim is best compassed by immobilisation, because this helps in the formation of a zone of fibrous tissue round the lesion, and prevents friction of diseased joint surfaces. The best splint is plaster of Paris. Bandages should be of plain book muslin No. 11, and should be made as required, not bought ready made, this material being obtainable at 6s. 5d. the 12-yard length (width one yard), from Messrs. Muir, 28, Miller Street, Glasgow.

The following are some of the possible sequelæ. Sores under the plaster can be recognised best and earliest by a foetid smell. Plasters should be regularly smelt, and any sore detected have a window cut down to it. (Edema of the limb below the plaster should be treated by bandaging from the periphery upwards. To secure proper immobilisation the joints above and below the lesion must also be fixed. Also plasters must be "moulded," before setting, round prominent bony points like the iliac spines, the clavicles and scapulæ. Correction of deformities consists essentially in antagonising muscular spasm by means of extension. In spines the psoas muscle is stretched by hyper-extension of the spinal column either by a pad under the spinous processes of the affected vertebra, or better by Gauvain's "back-door" and "wheelbarrow" splints, which are more powerful and permit of the patient being attended to without cessation of the extension.

With regard to the aspiration of cold abscesses, incision must be absolutely condemned, as leading straight to sinus formation. After aspiration, on the other hand, the abscess wall collapses and (if the cavity be kept empty) is thickened, shrinking towards the causative lesion, and becoming finally a fibrous envelope, which slowly absorbs. The chief points to remember in aspiration are: (1) Asepsis as for a major operation. (2) Puncture beginning some distance from the abscess, so that the needle traverses healthy tissue, and when withdrawn leaves a valve-closing track, and also puncture away from a dependent part. (3) Aspirate slowly. (4) Avoid ethyl chloride spray or the puncture wound is liable to go septic. (5) Apply a pad after and bandage firmly. Pus too thick to run through the cannula may be treated with a modifying fluid, or by a small amount of sterile water.¹

Diagrams showed how an abscess might be made to "present" to the needle.