of muscles, with suture of the skin edges deep down close to the joint; and with most satisfactory results. This I described in *The Robert Jones Birthday Volume*.

PART III.

RESULTS OF OPERATION.

With regard to results I think it will be most helpful if I briefly summarize my experiences.

DIAGNOSIS.

Arthroscopy.—Certain bacteriological or histological diagnosis is most needed in those very early cases, clinically synovial, which otherwise cannot be identified with certainty. Unfortunately in my experience we have had a number of such cases in which in the specimen of synovia removed tubercle bacilli have not been found either by a prolonged microscopic search or by inoculating a guinea-pig; in these the histological diagnosis has often been non-committal.

TREATMENT.

Hip.

Adults.—I have recently published my views and experiences of hip operations.[†] In general, I would say that the difficulties lie less in the technique than in the human materials. Operations which are most satisfactory in cases where the morbid anatomy is similar but non-tuberculous often fail where the bones are decalcified and devitalized by tuberculosis. This is particularly true of grafting operations. At present I feel that the solution lies in early radical excision and late grafting. And in certain types and older ages I think amputation is indicated.

Children.—Of those treated by excision and arthrodesis none have been done long enough for a final report. I am finding it sometimes necessary as a result of much granulosomatous tissue, but always as part of, or preliminary to, extra-articular arthrodesis. In those treated by extra-articular arthrodesis I have had about an equal number of satisfactory results and of failures, from absorption at the middle of the graft, due to the non-recolonization of the graft, or failure in obtaining a firm hold at one or other end. There have been no cases of sepsis, sinus formation, or sequestration. The graft has to pass close to the granuloma, and is therefore liable to become infected itself, or to fail to take hold or thicken on account of lack of initiative shown by the devitalized bone cells of the neighbourhood. The difficulties in obtaining a really effective arthrodesis may be great, but the indications are at least correspondingly strong. The hip shares with the knee an increasing notoriety for grumbling persistence and recrudescence, and has long possessed a unique name for deformation, insidious and malign. It adducts and flexes, and nothing but synostosis will stop it.

Knee.

Adults.—Local result uniformly good. End result: new lesions in other parts of the body have developed in several cases. That is to be put down to failure in general treatment. For severe septic infection of tuberculosis of the knee in adults I believe in amputation, not excision. On one occasion such a knee was excised by another surgeon—widespread sepsis, pyaemia, late amputation, and death followed.

Children.—None operated on. I have recently seen a girl of 19 whose knee had been excised in 1921. She has 7 inches of shortening! The lower epiphysis of the femur had been damaged by the surgeon and growth had ceased. I am still keeping the tuberculous knees of children in callipers, but I have become convinced that excision in children older than 10 with much articular damage may well prove right.

Ankle.

Adults.—Mainly treated by conservative measures. Operations only two astragalectomies, one of these done elsewhere. The local results have been good, but only two cases have been treated, one by Mr. Joyce at the Wingfield Orthopaedic Hospital, the other elsewhere.

Children.—None operated on.

Shoulder.

Adults.—I have only excised one tuberculous shoulder. The local result was excellent, but a year later generalized tuberculosis developed and the patient died.

Children.—None operated on.

Elbow.

Adults.—I have excised only one. The local result was good, but bony ankylosis has been delayed.

In Part II I made my suggestions definite—to invite criticism, and brief—to invite fuller and better statement. Further, I would add the warning that generalizations such as these are only general guides, and cannot be applied to any single patient, for each needs personal consideration.

* On this subject see an article on joint disease by R. K. Ghormley in the *Journal of Bone and Joint Surgery*, vol. viii, No. 4, October, 1926.
† *The Robert Jones Birthday Volume*, p. 347.

THREE HUNDRED CASES OF TUBERCULOSIS OF THE HIP-JOINT:

THEIR LATE END-RESULTS, AFTER AN AVERAGE PERIOD OF SIX YEARS AND NINE MONTHS.

BY

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USUALLY the accumulation of statistics gathered from clinical data is of little value. Nevertheless, there are times in the life of a surgeon when he is impelled to review the end-results of the treatment he has employed, hoping to encourage himself by finding that his efforts have met with success, and also wishing, by examining his failures, to find their cause and so, if possible, improve his future patients' chances.

It is with these ends in view that the study of the first 300 cases of tuberculosis of the hip-joint treated in the King Edward VII Hospital, Sheffield, has been undertaken; only those cases are included which have been re-examined personally by the author at least two years after, and an average period of six years and nine months after discharge from the hospital.

Girdlestone¹ has written: "The diagnosis of tuberculous hip disease rests on probabilities until either destruction has advanced to such a degree as makes the radiogram evidential, or abscess formation renders a conclusive test possible in the finding of tubercle bacilli."

The first difficulty, then, was to be sure of the diagnosis; in many cases tuberculosis of the hip was confirmed by radiographic or bacteriological means. This eliminated three of the other common conditions which may be mistaken for it—namely, pseudo-coxalgia, coxa vara, and infection with pyogenic organisms (usually the staphylococcus). The remaining common type of arthritis of the hip-joint is the so-called "transient arthritis," which is due to toxins from a local focus of inflammation. It is impossible to be sure in all cases that patients with apparently early tuberculosis of the hip are not in reality suffering from this affection, and it is almost certain that some patients with this condition have been included, especially in the group of cases in which recovery was complete. However, every effort has been made to eliminate such patients by excluding all those in which the symptoms disappeared permanently with one month's treatment. Apart from taking care that the above conditions were observed, no selection of cases has been made.

THE TREATMENT EMPLOYED.

The usual methods for improving the general health of the patients were used, and included nursing in the open air, real and artificial heliotherapy, and a generous but simple diet containing abundance of foods with high vitamin A and D content.

The local lesions were dealt with by those conservative methods of treatment first used so successfully in this country by Sir Henry Gauvain, together with various modifications on the lines advocated by Sir Robert Jones, Girdlestone, and others. Briefly the methods employed may be described as follows.

1. Acute Stage with Active Progressive Disease.

The principles underlying treatment at this stage are immobilization in bed, with traction to counteract muscle spasm. The ordinary weight-extension with pulley, the Pyrford frame described by Perkins,² and other forms of fixed extension were used in the treatment of the patients under discussion, according to the degree of activity of the disease and amount of deformity. Traction was maintained in one of these ways until the spasm of the muscles had disappeared and until deformity had been corrected as far as possible.

2. Transition Stage.

After deciding by clinical and radiographic examination whether a movable or a fixed joint would be the probable end-result, one of two different forms of treatment was adopted. In the former instance weight-extension was

continued for a period of three to six months; the patients were then allowed to lie in bed without retentive apparatus, and if movement continued to increase or was not diminished were considered to have passed into the convalescent stage. If, on the other hand, ankylosis or imperfect mobility were probable, the hip was fixed in plaster-of-Paris until as complete ankylosis as possible had taken place. In this connexion it is important to note that a double hip plaster, with a long spica on the affected and a short one on the sound limb, should be used; if this be not done there is a tendency for the pelvis to tilt even in a well-applied plaster, with subsequent adduction deformity. This will be referred to again later. If the adduction and flexion of the limb could not be corrected during the first stage, recently it has been my practice to apply the plaster under an anaesthetic, when the deformity was easily corrected, in most instances without the application of any force.

Experience is the only guide as to when it is safe to allow the patient up with crutches and patten, and also as to when he may be permitted to replace the complete fixation of plaster by the less marked protection afforded by celluloid or other splints.

3. Convalescent Stage.

Patients were usually discharged from hospital at the beginning of this stage, and usually went home wearing a celluloid hip spica like those made at Alton,³ and using crutches and patten. They were examined at intervals as appeared necessary. After a period varying from six to eighteen months the splint was discarded, and later still the patten and then the crutches were given up.

RESULTS.

The results obtained fall into four groups.

1. Those patients in whom there was a perfect functional result, with an almost completely full range of movement, no shortening, and no sign of disease.

2. Patients with quiescent disease, which was apparently arrested, but who, through shortening or fixation of the limb, were left with a certain amount of deformity and disability.

3. Patients in whom the disease became active again.

4. Patients who died or became worse in spite of treatment.

1. Patients with no sign of disease:

Number	...	167
Examined after discharge from hospital	...	65.5 months*
Average duration of hospital treatment	...	367 days
Average period with splints after discharge	...	10.8 months
Number working at present	...	40

* Average.

2. Patients with arrested disease but some disability:

Number	...	97
Examined after discharge (average period)	...	85 months
Average duration hospital treatment	...	708 days
Average period with splints after discharge	...	46 months
Number working at present	...	29

The amount of disability in these patients may be gauged as follows:

Limping badly	...	44
Shortening of over 1 inch	...	47
Some adduction	...	41
Some abduction	...	33

It was, of course, the "adducted hips" which limped most, and it is thought that if the precautions (1) of fixing both hips in plaster, (2) of correcting adduction under an anaesthetic and then applying plaster, as suggested above, be more often taken, this deformity, with its consequent limp, will not be found so frequently.

3. Patients with recurrence of disease:

Number	...	28
Recurrence occurred after discharge	...	52.8 months
Recurrence while still using splint, etc.	...	20
Average duration hospital treatment	...	531 days
No sign of fresh recurrence after average of two years from second discharge	...	14

4. Deaths and hopeless cases:

Number	...	13
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A NOTE ON TUMOURS OF ENDOCRINE GLANDS.*

BY

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It is becoming more and more probable that a neoplasm (benignant—or malignant, of the nature of a sarcoma or carcinoma) may arise from any kind of living cell in the body, at any immature or mature stage of its development, if the necessary (but only partly known or surmised) conditions are present. The cells of the neoplasm morphologically and metabolically may more or less resemble—and apparently endeavour to continue the functional activities of—the normal cells from which they have originated. A sarcoma derived from the mature or immature elements of striped muscle may betray its origin by the striation of some of its cells or fibres, just as an extrahepatic metastasis from a primary carcinoma of liver cells may signify its hepatic glandular descent by the secretion of bile. The presence of bile in some primary hepatic carcinomata seems to have been first described by Perls, in his manual of general pathology in 1877.² Analogous observations in regard to other adeno-carcinomata are now too numerous to mention here.³ No theory regarding benignant or malignant neoplasms can hold good unless it recognizes the above considerations. Apparent exceptions are probably due to insufficient knowledge. Even the various cells of the blood-forming tissues can be the site of neoplastic formation.

But for illustration and confirmation of these points a study of the primary tumours of the endocrine cells of the various endocrine glands is especially interesting. In the short time at my disposal I can do little more than allude to some of them. An important point of distinction between endocrine tumours (that is to say, primary tumours of the endocrine cells of ductless glands) and primary tumours of the secreting cells of the duct glands is that in the former their secretions (as those of the normal endocrine cells from which the tumours arise) are freely absorbed into and distributed by the general circulation.

Before proceeding further I would draw attention to the following points: (1) Although the hormonal effect of an endocrine tumour may, perhaps, be qualitatively not exactly identical with that of the corresponding endocrine gland of a normal individual, nevertheless, on the whole (especially before the tumour cells have become too much altered by malignant change), it may be regarded as the "magnified" hormonal effect (and therefore may even serve to shed light on the normal hormonal functions) of the endocrine gland in question. (2) The hormonal activities of certain endocrine tumours need a youthful body (one still capable of further growth and bodily development) fully to manifest themselves. (3) When one bears in mind that an affection of one endocrine gland must almost necessarily cause reaction in others, it does not seem surprising that the clinical picture in cases of endocrine tumours may sometimes be obscured by pluriglandular symptoms. Macrosomia (precocious bodily growth) or macrogenitosomia (the syndrome of abnormally large body and genitalia, that is to say, precocious sexual and general bodily development) may be caused by endocrine tumours of the suprarenal cortex, of the anterior lobe of the pituitary gland, of the pineal gland possibly, of the interstitial cells of the testis, and likewise by some ovarian tumours.⁴ Active enlargement of the male mamma, as I have elsewhere pointed out, may be excited by, or result from, endocrine tumours or other disturbances of various endocrine organs.⁵ (4) Non-endocrine tumours arising in, or in the neighbourhood of, endocrine glands, by pressure, destruction, or stimulation (increased blood supply), may cause endocrine symptoms. (5) Some

* A paper read in the Section of Medicine at the Annual Meeting of the British Medical Association, Manchester, 1929.

² M. Perls: *Lehrbuch d. allg. Pathologie*, p. 482. Stuttgart, 1877, Teil i.

³ For a short review of such observations see F. Parkes Weber, *Endocrine Tumours*, *Proc. Roy. Soc. Med.*, Section of Medicine, 1929, xxii, p. 9, commencing remarks.

⁴ F. Parkes Weber: *Loc. cit.*, p. 20.

⁵ For references see F. Parkes Weber, *loc. cit.*, pp. 16, 17.