

M. SISEFSKY, VARBERG:

ON ILIOSACRAL TUBERCULOSIS

Having been for some time past occupied in a close study of iliosacral tuberculosis based on the clinical material available at the Coastal Sanatorium at Apelviken, I propose, on the strength of that material and a study of literature relating to the subject, to submit some views on this particular location of tuberculosis. For the clinical material placed at my disposal, and for much valuable advice and information, I am indebted to my Chief, Med. Dr. *Robert Hanson*.

In the first place it may not be out of the way to consider for a moment the different terms under which sacroiliac tuberculosis has appeared in the literature. In France it has been termed, ever since the time of Larrey, »sacrocoxalgie«. The corresponding term in German literature is »sacrocoxit«, while in Anglo-American nomenclature it is referred to as »sacroiliac disease«. Nowadays, most authors definitely reserve this term for tuberculous disease of the joint in question, while others, fully cognisant of the fact, describe thereunder all kinds of inflammatory conditions of the iliosacral joint; indeed, English and American writers include under it even various traumatic and other affections.

This is apt to cause confusion. Furthermore, the terms »sacrocoxalgie« and »sacrocoxit« are less suitable on account of their auditory similarity to »coxalgie« and »coxit«. With a view to creating a uniform and convenient terminology, *Pinchcliffe* suggested, in 1927, the use of »sacro-ileitis« as a common term for all inflammatory conditions of the iliosacral joint, with the additional adjectives of tuberculous, septic, luetic, rheum-

atic, etc. to indicate more definitely the etiology in each case. I have been unable to find that this suggestion of Pincherle has had any followers. Where none of the above-mentioned terms are used we find the non-tuberculous conditions referred to in more or less roundabout ways, a state of affairs which from the viewpoint of nomenclature gives rise to the greatest difficulties. It may be said in passing, that the terms »ileosacral« tuberculosis, »sacroileitis«, etc., seem to be less appropriate than »iliosacral« tuberculosis, etc.; *ilium* being the usual term for the pelvis, whilst by *ileum* we mean the small intestine.

In his great monograph on surgical tuberculosis, published in 1932, *Sorrel* says:— »Si on designe sous le nom de sacrocox-algie la tuberculose isolée de l'articulation sacroiliaque, c'est une affection infiniment rare«. For his own part he had only seen two cases in which such a diagnosis was warranted. All other cases observed by him, he considers to have been extensions from adjacent foci, chiefly from tuberculous foci in the sacrum.

Considering that the sacroiliac joint is at present, I believe, fairly unanimously recognised as being a true articulation with all the attributes appertinent to such a joint, (*vide Goldthwait and Osgood, Albee, Sashin*, and others) there is no reason why it should not conceivably be the seat, just as well as other joints, of synovial as well as osseous forms of tuberculosis.

The synovial origin of the iliosacral joint has always been strongly disputed, however. A few observers (*Satterwaite, Golding-Bird, Erichsen*) might possibly be in favor of it and *Tillmanns* is inclined to believe in its existence on the strength of his own experience. Others again maintain its non-existence, or that it occurs exceedingly rarely. In view of the insignificant rôle played by the synovial element in this joint, the latter view is perhaps not likely to cause surprise.

The origin of iliosacral tuberculosis is thus always, or nearly always, confined to the articulating end of the ilium, or more often to that of the sacrum. In spite of its origin in one or the other of those articulating ends, the disease should nevertheless, as is the case with other joints, be regarded as tuberculosis of the *joint itself*. On the other hand, it would seem advisable to

distinguish the true form — let us call it the primary iliosacral tuberculosis — from those forms of pelvic tuberculosis that begin with a focus at a greater distance from the iliosacral joint, whether in the ilium or the sacrum, and which only affect the iliosacral joint at a later stage, in the same way as a coxitis may affect it through continued destruction of the acetabulum. That the classification is thereby rendered to some extent arbitrary is unavoidable, just as in the case of other joints. It is in such a light that I have regarded the present clinical material.

Apart from *Sorrel's* opinion, it is generally held that iliosacral tuberculosis is a rare disease. During 1896—1919, *Valtancoli* observed 31 cases among 1,271 cases of spondylitis and 750 cases of coxitis. *McCullough* stated in 1926 that an enquiry among roentgenologists of great repute showed that they had seen on an average 4 cases per year in the course of the last ten years. According to *Joachimowitz*, in 1925, about 2 cases were seen per year in big orthopaedic hospitals. In children the disease is said to be particularly rare. In 1906 *Barbé* collected 20 cases in children below fifteen years of age, 17 of which were found in the literature. After him *Massabuan*, *Guibal* and *Cabanac* stated, in 1929, that they had found no further case in the literature. These authors perused the »*Annales du service de chirurgie infantile*» and found therein, during the period 1896—1929, only three cases, they themselves publishing a fourth. In 1906, *Spitzzy* and *Reiners* published 3 cases, of which one, however, was of septic nature. In his statistical account of surgical tuberculosis of childhood, *Sven Johansson* records only one case, but states that the condition is by no means rare in adults.

At the Apelviken Coastal Sanatorium we have had under treatment, from 1920 inclusive until the present time, 107 cases in which some affection of, or in the neighbourhood of, the iliosacral joint was diagnosed. In 66 of these, the diagnosis of iliosacral tuberculosis was certain or reasonably probable, topically as well as etiologically, with the disease originally confined to the joint or the margins of the joint; and in 18 cases the affection had probably extended from neighbouring, more distant foci. In 5 cases the diagnosis was uncertain, and in 10 cases,

although an affection of the iliosacral joint was at times suspected, some focus in the sacrum or ilium (of tuberculosis or septic origin) must be regarded as having been most likely the source of origin. Five cases had definitely or probably septic affections

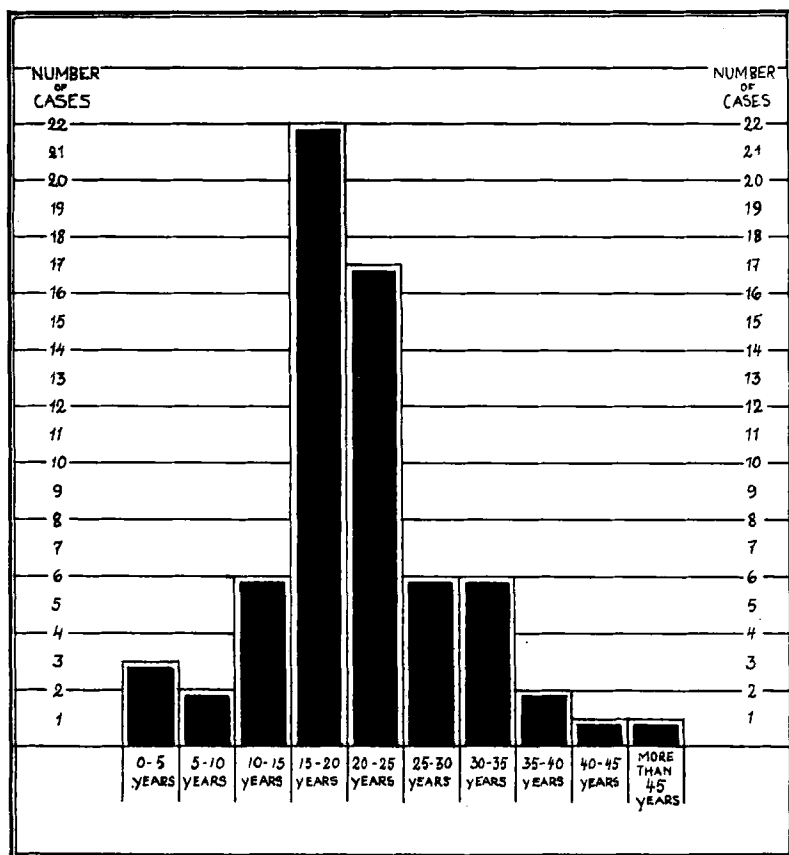


Fig. 1.

of the iliosacral joint; in 2 cases it was a question of malignant tumor, and in one case of a traumatic affection. The age incidence among the 66 cases of primary iliosacral tuberculosis was as follows:—

No definite estimate can be based on these figures, however,

respecting the frequency of the disease in Sweden, owing to the variable conditions with regard to admission of patients to the Apelviken Coastal Sanatorium. It may however be deduced from the figures submitted that the disease is by no means so uncommon as generally maintained.

Most earlier writers on the subject, and also some of the later, for instance *Zesas* and *Steinthal*, consider males to be more liable to this disease than females, presumably on the widespread assumption that trauma is an important factor in its production, a matter to which I will return later. *Valtancoli*, *Oelecker*, *Joachimowitz* and *Ingelrans* are of a different opinion. The cases submitted here divide themselves equally between 33 females and 33 males.

Zesas as well as *Valtancoli* state that the right side is more often affected than the left. Of the 66 cases presented here, 32 are in the right side and 34 in the left. In one case the affection is decidedly bilateral, in 2 cases most likely so; in still another 2 cases possibly so. Individual authors deny the existence of the bilateral affection, except when produced by progression from one side to the other with consequent widespread destruction of the sacrum; there are also those (e.g. *Pincherle*) who consider a bilateral affection as pathognomonic of lues. Others again, such as *König* and *Bardemheuer*, have described cases of definite bilateral tuberculous affection; the latter has recorded two such cases operated on. In the bilateral cases presented here there were no signs of lues.

In the opinion of many authors, iliosacral tuberculosis often arises through descending abscess from a spondylitis, which abscess, on its way past the iliosacral articulation, sets up a tuberculous local infection there. They also consider iliosacral tuberculosis to be especially common in connection with lumbar spondylitis; indeed, there was a time when it was always considered a complication to that condition (*Ridlon* and *Jones*). Among the cases under review here, there were 7 in which the iliosacral tuberculosis was combined with spondylitis, which in 6 cases was lumbar spondylitis; namely, 3 in L1—L2 and one each in L3—L4, L4—L5 and L5—S1. It is not always possible

to show to full evidence that the two diseased processes have lasted for the same length of time, thus enabling one to exclude the possibility of the iliosacral tuberculosis having arisen as a complication to the spondylitis as described above. In one fatal case, autopsy showed the iliosacral tuberculosis to be right-sided, while the abscess arisen from a lumbosacral spondylitis was in the left side. In another case the processes were probably of equal duration, judging by the onset of symptoms and the roentgen appearance. It may perhaps not be inconceivable for embolic foci arisen simultaneously in different parts of the body to remain latent for different periods of time.

Among contributory factors causing the tuberculous process to become located in the iliosacral joint, traumata have been considered to play a great part. Thus, *Sayre* maintained that a trauma was necessary, and believed, like many others, that the followers of certain occupations were particularly liable to this complaint, in particular artillery men and cavalry men, also athletes, tailors (on account of their way of sitting with their legs crossed) and laundry women (on account of their stooping position).

Among the cases presented here there is no evidence indicating trauma to be of any importance as an exciting factor. Only in four cases is there trauma in the history, and even in those cases, the part it played must for various reasons be regarded as most uncertain. Only in one case does it seem possibly that it may have played some part. This was the case of a youth, aged 20, engaged at some pleasure »merry-go-round« show; his occupation was to brake, twice a day, with his feet the speed of a swinging trapeze loaded with several persons. While thus occupied he got »sciatica«, which subsequently proved to be iliosacral tuberculosis. What makes one doubtful, however, even in this case, is that the patient had had pains in the same hip four years earlier — although only for a fortnight in connection with some slip on the ground — and particularly that his complaints during the above occupation began as early as two weeks after he had commenced his duties.

As far as the females are concerned, great importance has

been attached to pregnancy and parturition, with the attendant strain to which the iliosacral joint are subjected. This view is not supported by my material, which supplies only one case in which iliosacral tuberculosis commenced at a period when pregnancy or parturition might have played some important part. In this connexion it must be understood that the same patient had lumbar spondylitis (L1—L2), and according to all the evidence this had persisted as long as the iliosacral tuberculosis. Of course, we do not wish to by this commit ourselves respecting the effect that pregnancy and parturition may have on the organism as a whole, and the tuberculous manifestations anywhere in the body which may be derived therefrom.

In so far as the iliosacral joint is concerned, another factor among those that are believed to give rise to tuberculosis in that joint has recently been brought forward, namely that of ossification of the lower limbs, and the more abundant blood supply occasioned thereby during certain years of life. The epiphyses of the iliosacral joints do not arise until the age of sixteen, and their ossification is not completed until the age of twenty-five (*vide Barbé*). These conditions accord well with the age incidence of iliosacral tuberculosis — which shows an overwhelming maximum between the ages of 15 and 25 years — and also explains the old term of post-puberal tuberculosis of the ilium (*vide Souilloud*) for iliosacral tuberculosis, as distinguished from »pre-puberal« coxitis.

Regarding the symptomatology in my clinical material, it is conspicuous by its relative lack of symptoms even in those cases admitted here without any preliminary prolonged hospital treatment. The clinical picture is entirely dominated by pains confined either to the hip region or radiating along the lower limb. The latter symptom, which is of very common occurrence, always seems to give rise, during some part of the early stages of the disease, to the diagnosis of »sciatica«, with consequent massage treatment. This happened in 24 out of my 66 cases. In some of the others a gradually increasing pain in the hip region was evident as the first symptom, at first only appearing after physical exertion, but later constantly present even in reclining

position. Not infrequently, however, pains were entirely absent, the disease running its course free from symptoms until an abscess or fistula formed. Sometimes no particular importance has been attached to the pain, but rather to a feeling of instability in the region of the hip. This instability or pain gradually gives rise to a limping gait. From what has been observed here we have been unable to find this gait to possess any characteristic features such as have been spoken of by some authors («*caludication saluante*», *Broca*, *Jesover*).

The pain causes the patient to relieve the affected side by transferring the body weight to the healthy side. This results in tilting of the pelvis with abduction and apparent lengthening of the leg on the affected side. *Sayre* considered this position characteristic. But we may also find a lowering of the pelvis with apparent shortening of the affected side — probably owing to flexion in the hipjoint — as a result of pelvic abscess. Some early authors, like *Hahn* and others, regarded these apparent changes in the length of the limb as an expression of the ligaments of the iliosacral articulation being stretched with true lengthening or shortening as result of destruction in the joint. Even in cases where such destruction has been at its worst we have been unable to detect any measurable difference in the length of the limb.

Among other signs of iliosacral tuberculosis, the most constant has been tenderness on pressure over the back of the joint where this is most readily accessible for palpation. It was often associated with some palpable infiltration of the tissues in the immediate vicinity of the joint. Tenderness on pressure was often insignificant and only present over a small part of the joint region. It had then to be carefully sought for; and sometimes it disappeared, as did the swelling, after only a few days in bed. Tenderness on the anterior aspect of the joint, elicited on rectal examination, is also said to occur. I believe that in adults it is only in exceptional cases that the palpating finger can thus reach the joint, and where the finger fails to encounter an abscess or swelling, the examination comes to naught.

An early and almost constant sign is atrophy, more or less marked, of the gluteal musculature, with altered appearance of the fold of the nates. In later stages there is also atrophy of the thigh.

Beside these signs and symptoms a great many others are described in the literature, some of them with personal names attached. They are all characterized by the recording of pain elicited in the joint in one way or the other. In the clinical material submitted here, sometimes one such symptom has occurred, at other times several simultaneously. The most usual one is Erichsen's sign:— pain in the joint on the pelvis being compressed from side to side. Sometimes this is elicited by simple lateral compression, even over the trochanters, at other times it is only to be obtained by gripping the iliac crests with the hands, and either compressing the pelvis forwards or forcing it apart backwards. In this form it sometimes goes under the name of Volkmann's sign. A similar pain is generally recorded on maximal abduction of the leg on the affected side, and, less commonly, on maximal adduction of both limbs, with the affected leg across the sound one (the leg-crossing test). In one case *Stieda* found pain only on maximal abduction of the leg on the *healthy* side. Pain in the diseased joint when the patient turns in bed is sometimes called Gangolphe's sign. A more common sign is that the patient is unable to lie on the affected side. Larrey's sign is produced when the patient sits in a chair and lifts himself with his hands, which grip the sides of the chair, and then suddenly lets himself drop down on the seat again; he then feels a pain in the affected joint. This sign has been found positively only on odd occasions. Occasionally, pains are elicited in the diseased joint on bending the lumbar spine to one side or another. Pain on sneezing has not been uncommon, pain on coughing less common; no pains have been observed on defecation or micturition.

A sign which seems to be looked for less often is *Trendelenburg's* sign. According to *Stieda*, *Spitzky* was the first to draw attention to this sign in iliosacral tuberculosis, and the former has subjected it to a closer analysis. His explanation of its

presence in cases of vertical fracture of the sacrum is similar to Spitzzy's; namely, that the contracted gluteus maximus presses the diseased and consequently painful joint surfaces against one another under the patient's efforts to keep up the pelvis. *Stieda* also quotes *Ludloff's* view, however, according to which the sign should arise through impairment — due to »Lockerung des Beckenunger« — in the iliosacral joint or the seat of fracture, of the two-armed lever constituted by the pelvis when the patient stands on one leg. It would not seem to be entirely out of the question that in cases of well-marked gluteal atrophy, which of course involves also the gluteus medius and minimus, the sign may simply be the result of the atrophy, and thus due to the same condition as the one which exists in gluteal paresis.

In our cases the sign has been present not infrequently; yet it has by no means occurred parallel with the atrophy, but rather in the most painful cases; it has also disappeared simultaneously with the pains which is also in accordance with the view of *Stieda*.

More frequently, however, than the presence of a positive sign, it has happened that the patient on account of pains or lack of stability in the hip region has been unable to bear any weight at all on the affected leg.

Abscesses were observed in 41 of the 66 cases, or about 62 per cent. The figures found in the literature, respecting the presence of abscesses, show their occurrence to range from 30 to 80 per cent. It is generally believed that the abscesses usually break through anteriorly and become intrapelvic on account of the capsule and ligaments being thinnest there. It is quite true that the posterior ligaments are more powerful and form a fairly coarse network, while the anterior aspect of the joint is covered with a more homogeneous, though thinner, ligamentous mass of bands. *Kraemer* and *Wiese* maintain that posterior extrapelvic abscesses are twice as common. Out of the 41 cases with abscess formation, 11 broke through only anteriorly, 15 only posteriorly, and 15 anteriorly as well as posteriorly. To deal with the various directions subsequently taken by the abscesses, and the different points where they reached the skin

surface, would take us too far afield, and is perhaps of minor interest in this connexion.

Considering the important part played by roentgen examination, a few words must be said about this method of investigation. During the first year of life, the iliosacral joints appear in the skiagram as wide slits divergent downwards. In the course of the next few years they gradually adopt a position more



Fig. 2.
♀ 19 years.

parallel with the long axis of the body, owing to the relatively more rapid growth of the upper part of the sacrum. This transformation takes place before the sixth year of life. Up till this age the joint planes are also approximately parallel with the sagittal plane of the body, causing the anterior and posterior borders of the articulation to become superimposed on one another, as seen in an antero-posterior skiagram. Between the sixth and tenth years the upper and anterior part of the sacrum grows more rapidly than the rest, with the result that the anterior borders of the joint become displaced laterally, and

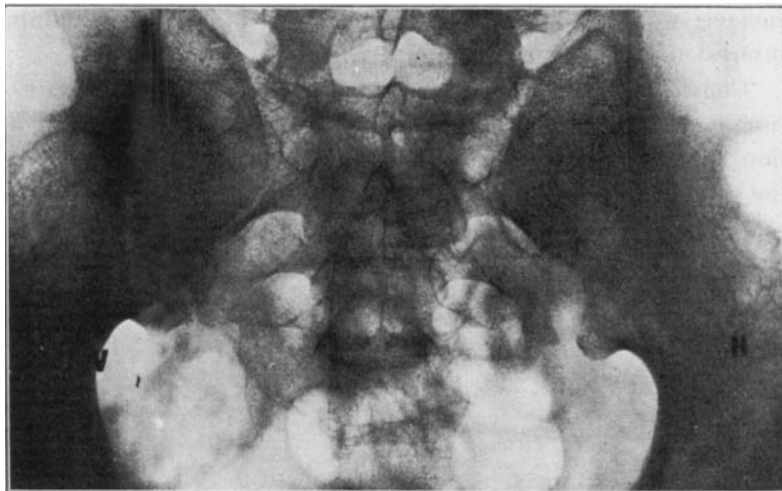


Fig. 3 a.
♂ 22 years.

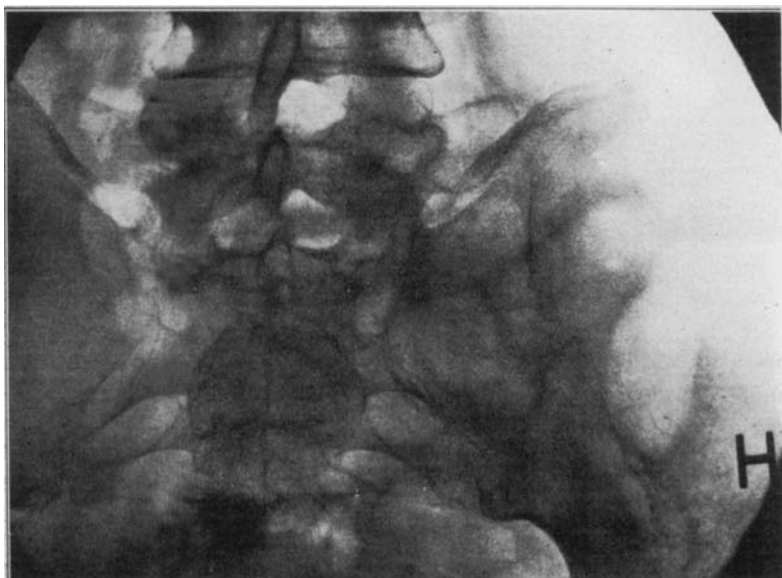


Fig. 3 b.
♂ 25 years = Fig. 3 a 3 years afterwards.

curve forward and outward. In a skiagram, the anterior border now appears separate from the posterior one, and on the lateral aspect of this. At this period, sexual differences also begin to assert themselves; thus, the male sacrum shows a greater development in length than in breadth, besides becoming more curved. This becomes still more apparent from the tenth year

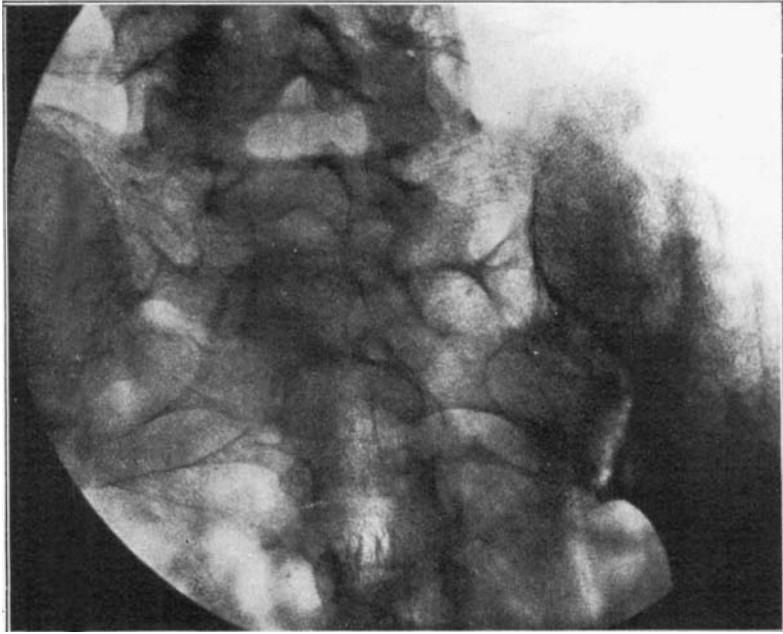


Fig. 4.
♀ 18 years.

onward, and by about the twentieth year the sexual difference is fully developed. The female sacrum, besides being broader, presents, in the skiagram, a greater convexity of the upper part of the outline of the anterior border of the iliosacral joint, which in the male runs straighter and does not become more convex until after the forty-fifth year of age. In skiagrams of the pelvis of female subjects of advanced age, the posterior cartilage slit is not infrequently found to be increased in breadth. This is supposed to be due to past labors. In what has been said above

I have mainly followed *Happel*, who has contributed largely to the elucidation of the roentgenology of the iliosacral articulation.

In adults we thus find that in the ventro-dorsal projection the rays strike the space of the iliosacral articulation in an oblique direction; and in the ray-beam we find the iliac tuberosity behind, and the lateral mass of the sacrum in front, cau-



Fig. 5.

♀ 19 years.

sing dense shadows, which eliminate all finer details and early pathological changes in the contours of the joint. Also, we find the anterior outline of the joint coinciding partly with the upper one, and the posterior outline coinciding partly with the lower one. When to this is added the difficulty of obtaining a good picture of the osseous structure, owing to the bones being covered by soft tissues of considerable thickness, it will be readily understood that reliable roentgen findings can be obtained only by the most critical examination and by strict comparison with the other side; and also why the roentgen-

diagnosis is often negative, late in coming, and sometimes incorrect.

An oblique picture, with rotation of the pelvis 15° — 20° toward the affected side, but sometimes toward the healthy side, will sometimes yield more reliable signs than the ventro-dorsal skiagram.

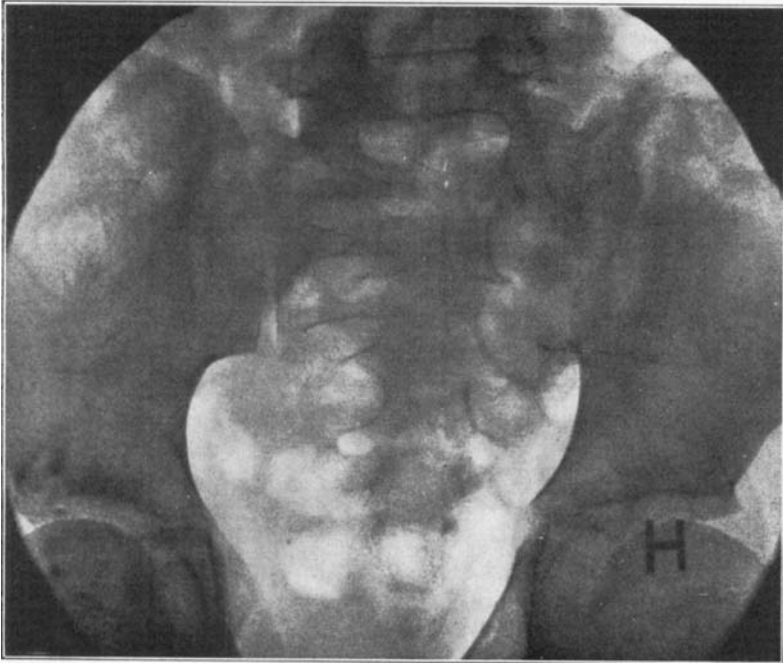


Fig. 6.
♂ 11½ years.

In this connexion it may be worth mentioning that *Neyman* recently published an attempt at standardisation of the technique for radiography of the sacro-iliac joint. His method consists in taking one dorso-ventral survey-picture, beside two oblique pictures in supine position with definite direction of the rays, one showing mainly the anterior and posterior borders of the joint, the other showing its upper and middle parts. Concerning the value of this technique in cases of joints that are

the seat of pathological changes, *Neyman* does not as yet feel inclined to commit himself to any definite opinion. Up to the present I have only had the opportunity to try his method in one or two cases, and I am consequently not in a position to say whether it has any advantage over the one usually employed.



Fig. 7.
♂ 4 years.

A frequent difficulty with roentgen diagnostics is that observations once made, and presumably the outcome of changes in the joint, are in a subsequent skiagram found to have entirely disappeared. In such cases one often has to leave it an open question whether a diseased focus has undergone some transformation, causing it no longer to appear in the film, or whether the first picture had led one entirely astray.

In early cases of iliosacral tuberculosis there is less likeli-

hood than in other forms of surgical tuberculosis of finding any positive roentgenological indications, even in such forms which subsequently yield more obvious signs. In such cases the diagnosis must be based entirely on the clinical findings. As an early roentgen sign in iliosacral tuberculosis — and in some other forms of tuberculosis of the bony system, as well —



Fig. 8.

♂ 28 years. Tuberculosis of the right iliosacral joint.

Smith-Petersen and others have mentioned a dense opacity of the borders of the articulation. The state of decalcification common in other forms of joint tuberculosis seems to appear fairly late here, and even a slight mottling may often be a sign of marked changes. Great difficulties may be encountered in judging a circumscribed rarefied area. Its constant presence in various projections and on different occasions of course makes probable its character as an osteoarthritic focus.

It is now generally assumed that a form of iliosacral tuberculosis exists which is chiefly confined to the cartilaginous and

periosteal layers (*Joachimowitz*, quoted by *Eisler*) and perhaps also to the synovia — the condition being termed the synovial form of iliosacral tuberculosis whether its origin be synovial or not. In this form we find for months, and indeed for years, on the whole the same appearance. There is more or less

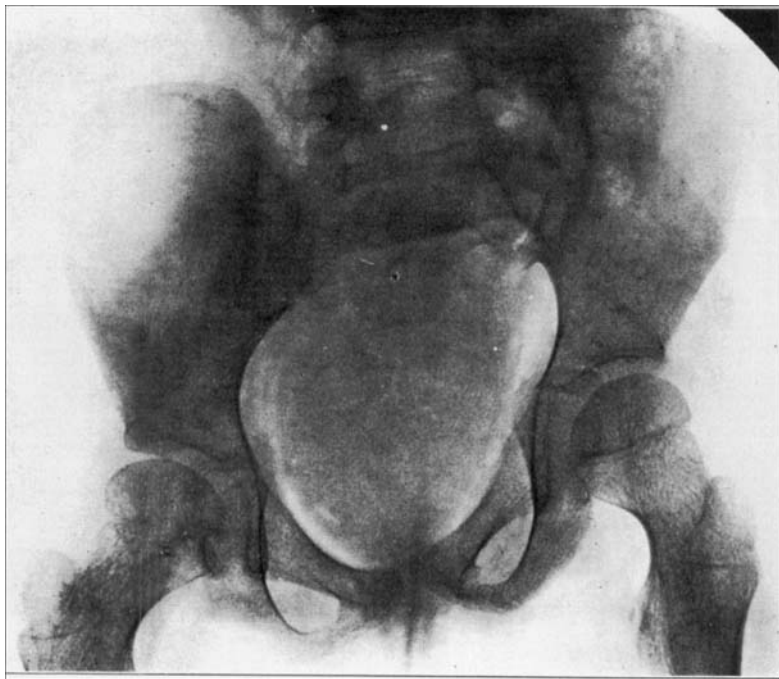


Fig. 9.
♀ 9 years.

atrophy, and sometimes, if we are fortunate, we may find a blurred outline somewhere on the articular surface of the sacrum or ilium; but except this there is nothing to be seen.

In cases presenting more obvious changes, these are generally seen in the lower part of the joint where, the latter borders directly on the foramen ischiadicum. We usually find here an increased breadth of the cartilage slit, the borders of which are blurred, indistinct or irregularly jagged, at times forming an oval rounded defect of varying size (*Fig. 3 a & b*). Similar

changes may also be found in other parts of the articular area. In cases more advanced, or which have been under treatment, portions indistinctly outlined vary with others where the borders are more or less sclerotic (Figs. 4 & 5). Such appearances probably correspond to those observed in cases of caries sicca with changes chiefly confined to the osseous layers.

The osseous changes may also produce another appearance,

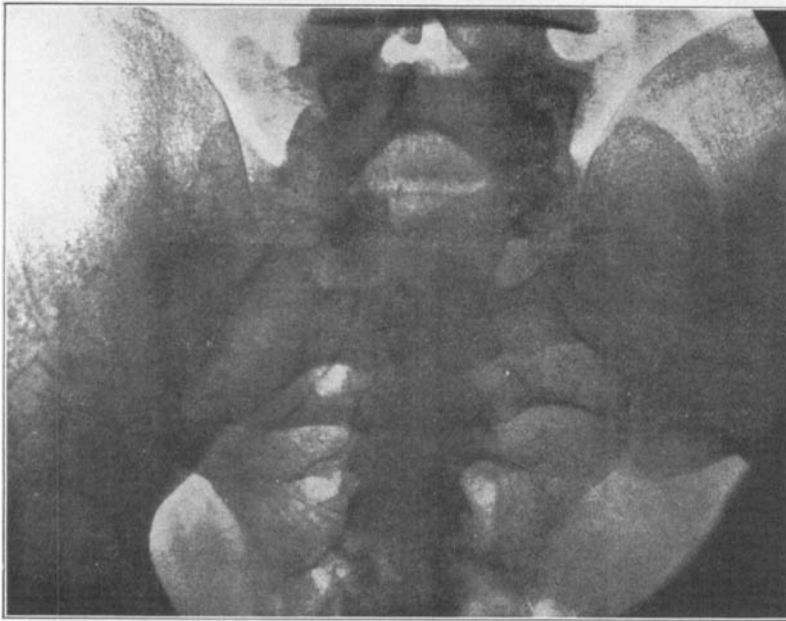


Fig. 10.

♂ 20 years.

however, in which the ends of the joint are seen to be reduced in breadth, with the borders deeply transformed as the result of widespread erosion (Figs. 6 & 7). In the lacunae of this zone of osseous destruction can be seen small bone fragments, and part of the joint may be covered with sclerosed substance (Fig. 8). As a result of the destructive processes going on in the pelvic part, the latter seems to be displaced inwards and upwards (Figs. 6 & 7), and in a growing subject this produces an

obliquely contracted pelvis (Fig. 9). It is necessary, however, to take a sagittal picture, as a reduction in breadth may otherwise easily be taken for a pelvic rotation.

With regard to the differential diagnosis, the roentgen appearance does not furnish us with any reliable data distinctive of other destructive processes than tuberculosis, except possibly



Fig. 11.

♂ 39 years. Tuberculosis in the left iliosacral joint with spicula formation of its lower border.

late stages of malignant tumor. Periosteal deposits as well as widespread bony ankylosis have been observed in tuberculosis, particularly in fistulous cases with secondary infections (Fig. 10), and also in septic affections of the iliosacral joint. Also spicula formation is not infrequently met with (as in arthritis deformans) in cases of iliosacral tuberculosis in the stage of healing (Fig. 11). Destructions with sharp edges are considered rather to be indicative of lues; likewise are large palpable depo-

sits believed to be indicative rather of this disease, or of septic osteomyelitis, than of tuberculosis.

In many cases of iliosacral tuberculosis there is a complete, or almost complete, absence of symptoms during the early stages. To what extent this has been the case as regards the pre-

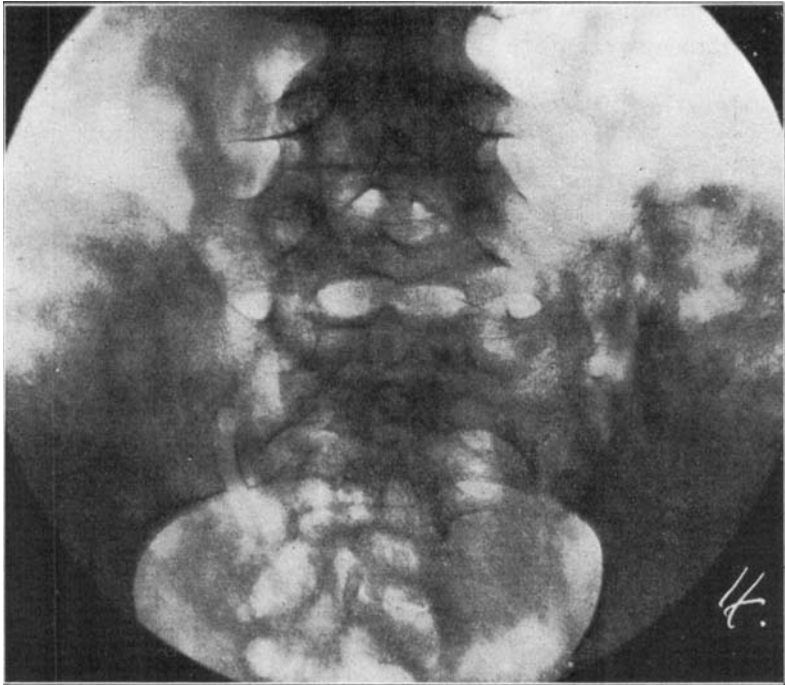


Fig. 12.

♀ 9 years. Septic affection of the iliosacral joint.

sent material it is unfortunately impossible to say, owing to the incompleteness of the historical data contained in the older clinical records. It is certain that many patients have sought medical advice merely on the ground of an abscess or fistula. To determine the origin of the latter is not always easy, since abscess formations from an iliosacral tuberculosis do not possess any particularly characteristic features. As a case in point, that of a small girl may be mentioned, who was treated in this hospi-

tal for two years, and in whom iliosacral tuberculosis was strongly suspected on account of pelvic abscess and fistulous tracts in the groin and gluteal region. Gradually however, the case proved to be probably a pelvic lymphoma. The roentgen appearance gave no clue for a definite diagnosis until calcification of the glands began to appear.

In those cases in which an iliosacral tuberculosis develops simultaneously with a spondylitis it is frequently overlooked

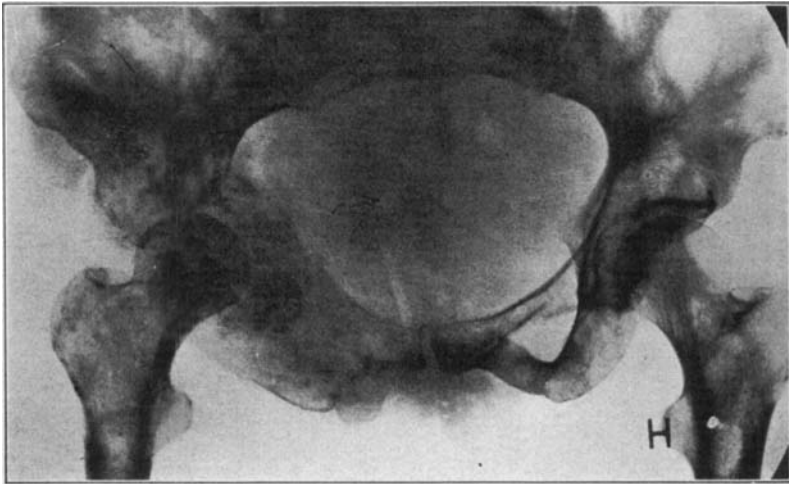


Fig. 13.
♀ 39 years. Sarcoma.

until, for instance, roentgenological changes happen to be discovered in skiagrams taken for some other purpose. Such has been the case twice in this hospital.

In the case where a patient with a tuberculous focus in some bone or other begins to complain of pain in the hip it is quite justifiable, of course, to suspect iliosacral tuberculosis. In a case of that nature, the pain may also have some other origin, however. Thus, we have come across cases of spondylitis and coxitis, and even of tuberculosis of the knee and foot, in which the complaints have led one to suspect iliosacral tuberculosis, but where the subsequent development showed that we had

probably to do only with functional pains due to altered distribution of weight. It has therefore not been unusual to find the soft parts in the neighborhood of the iliosacral joint to be tender and even swollen.

In cases in which there is no definite indication of tuber-

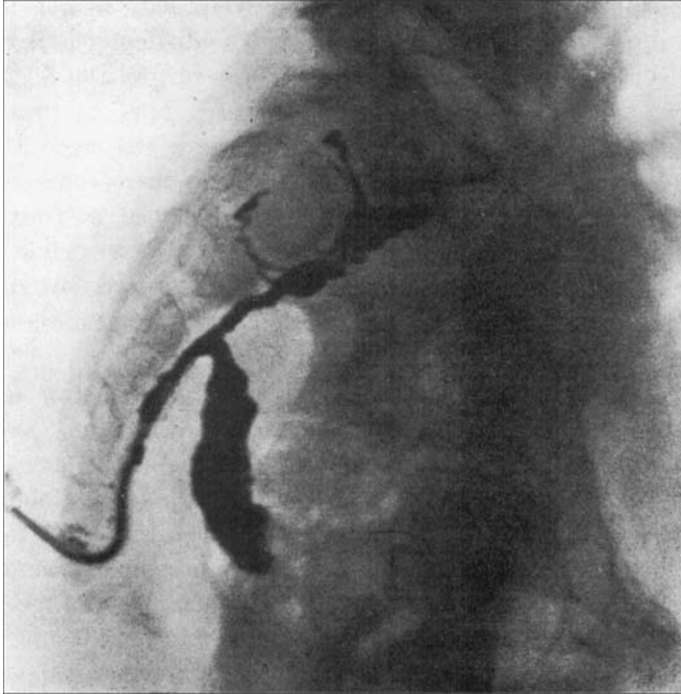


Fig. 14.

♂ 15 years. Tuberculosis of the Sacrum. Contrast-effect in the abscess.

culosis, the genesis of an affection of the iliosacral joint may be difficult to detect. Both acute and more or less chronic arthritis, with or without previous trauma (*Brofeldt*), as well as lues and gonorrhoea, yield local symptoms of a similar nature. The last named etiological factor seems, whether deservedly or not, to have received particular attention by American authors. *Strauss* has described a case in which he believed true gout to be the cause. In our cases we have only a few times been

called upon to consider the above etiological factors in discussing the differential diagnosis. Much more frequently have we been called upon to do so with regard to septic conditions. Sometimes it is probably impossible to distinguish the latter from tuberculosis. Acute onset of the disease, perhaps after an attack of angina or the like, a much impaired general condition, rapid abscess formation and intensive local symptoms, are considered as pointing rather to a septic genesis. The difficulty of arriving at a correct diagnosis is illustrated, however, by the following cases:

Case 1. Following an attack of quinsy, a girl, aged 11, got repeated spells of fever, and after a while there came aching pains in the right hip region. She stayed in bed, at first with high fever. Gradually an abscess developed in the right iliac fossa. Cultivation of pus from this gave no growth, but guinea-pig tests gave positive reaction for tuberculosis. The abscess was found to have originated in the right iliosacral joint.

Case 2. A girl, aged 8, who ever since an attack of scarlet fever had been »run down« and poorly in health got swollen glands in the neck. Twelve months after the scarlet fever had subsided she gradually, in the course of a week, developed a slight limping gait; in the meantime she had a »funny« feeling in the right hip region, but suffered no appreciable pain. When at rest she felt nothing. Following that week she had fever for a fortnight, but without any local symptoms. After that her limping continued for still another week, but then disappeared. A little more than two months after, the girl was brought to hospital because of a »crooked back« accidentally discovered by her mother. Suspicious roentgen changes were found in the right iliosacral joint, and she was sent to this hospital under the diagnosis of tuberculosis. Here an abscess was discovered in the lumbar region, and pus from the abscess yielded a growth of staphylococci. Similar cultures were also found later in foci subsequently arisen in her humerus and tibia. The local affection in the iliosacral joint will be evident from Fig. 12. Cases of that nature, difficult of interpretation, are of fairly frequent occurrence.

Concerning the cases in which pain is the only symptom, the field for differential diagnosis is an exceedingly wide one. Here iliosacral tuberculosis is one of the many causes of »low back« pain — to use an Anglo-American term which may cover not only inflammatory, static and traumatic conditions in the lower part of the back and pelvis, but also various conditions either congenital or occasioned by some marked, developmental disturbance or other.

As already mentioned, no small part iliosacral tuberculosis plays as a cause of »sciatica«. It is quite certain that »tenderness over the exit of the nerve« often means tenderness over the iliosacral joint. In this connexion it may be mentioned that in *Broca's* opinion sciatica in children is always a symptom of iliosacral tuberculosis, whereas *Ingelrans* has found no sciatic symptoms in the children with that complaint whom he has examined. Nor have such symptoms been found in the children under treatment for iliosacral tuberculosis in this hospital.

As a rule there would not seem to be any great difficulty in distinguishing iliosacral tuberculosis from coxitis even in such cases in which a pelvic abscess leads to a shifting of the weight, and thus result in a position of flexion and inward rotation in the hip-joint with corresponding limitation of movement. The diagnosis under which the patients have been admitted has often been subject to confusion in that respect, however; and as an instance of the difficulty sometimes encountered in the differential diagnosis, the following case may be recorded.

Case 3. A boy, aged 15, developed »stiffness« and occasional pains after a trauma to the right hip-region. On examination the hip was found to be free, and there was nothing to be seen except a slight atrophy of the thigh and gluteal region. Without actually limping he obviously spared his right leg, however. Roentgen examination showed moderate diffuse atrophy and blurred outlines of the right iliosacral joint; there was nothing abnormal to be seen in the hip-joint. Six months later it was thought that an irregular destruction could be observed in the lowermost part of the right iliosacral joint, but after four months more there was nothing pathological to be seen. He was now

discharged to go home, free from symptoms except for a slightly restricted flexion and abduction in the right hip-joint, presumably due to the immobilisation treatment. Eight months after, he returned with the same clinical symptoms as on his discharge, and roentgen examination now showed unmistakable signs of coxitis, but no signs, either clinical or roentgenological, of any affection of the iliosacral joint.

Sarcoma of the lumbar vertebræ or the sacrum may in the early stages be mistaken for iliosacral tuberculosis on account of the pains being similarly localized and of a similarly radiating character — the same kind of »sciatica«. Two such cases among those submitted here were sent to us as coxitis. In one of them, a girl aged 18, the diagnosis of tumor was settled by palpation, and subsequently verified by roentgen. In the second case, a woman aged 39, there were definite clinical signs of some affection of the left iliosacral joint, though the left hip joint was not free either. In this case roentgen examination easily settled the diagnosis (Fig. 13), but in an earlier stage of the affection the difficulties might have been much greater.

Sometimes, an abscess originating from some focus in the sacrum or ilium entirely away from the joint may cover the posterior aspect of the latter and thus appear as if arising from it. As a rule, the focus in the bone may be detected by local tenderness, and no functional disturbance will be found in the joint; no limping gait, no aggravated symptoms on standing or walking, no altered position of the limb. The situation may often be cleared up by roentgen examination. This happened in one of our cases in which opaque substance injected into the abscess led to foci located between the sacral vertebræ (Fig 14).

The prognosis of iliosacral tuberculosis was formerly always considered bad. *Erichsen*, for instance, considered every form of treatment as useless. Before long, however, different ideas began to prevail. *Sayre* and *Ollier* were among the first to advocate surgical treatment, and gradually it was found that even conservative treatment sometimes led to the desired result.

It is well known that present-day surgical treatment of this affection aims, on the one hand, at removal of the diseased

tissues and, on the other, at fixation, without radical treatment, of the diseased joint, by some either extra- or intra-articular operation. The latter kind of operations were introduced by Americans (*Albee, Smith-Petersen, Verral, La Ferte*), and also by French workers (*Lamotte, Tuffier, Hertz, Le Fort*), while it was chiefly Germans (*Bardenheuer, Schede*), but also a few Frenchmen (*Delbet, Picque*), who had already somewhat earlier practised treatment by resection. Finally, *Lecène* and *Leriche* have made themselves the advocates of a combination of both methods.

The conservative treatment as well as the different surgical methods have probably each their field of usefulness, although for the present there would seem to be no clear lines of demarcation between their various indications.

At the Apelviken Coastal Sanatorium the treatment has on the whole been conservative, and has been conducted on the following lines. When indicated on account of pain, or from the nature of the process or some other cause, the patient has been put in a plaster bed, the trunk and both lower limbs down to the knees included, and as a rule without extension, but in the case of severe pain sometimes with extension of the leg on the affected side. In other cases, rest in bed has been the only treatment adopted. When the clinical symptoms have disappeared — a slightly discharging fistula being no bar, however — and the roentgenological examination indicates that the pathological process has become arrested, the patient is allowed to get up from bed, at first with a hip plaster and later for some time with a hip support of leather; this by no means with the idea of obtaining immobilisation, and still less of relieving weight, but only for the purpose of hindering, to some extent, too excessive movements.

Abscesses have been punctured with or without injection of glycerinated iodoform, and those obviously the seat of secondary infection incised and drained. Fistulæ with exuberant granulations have been treated with silver nitrate or cleared out with a spoon, and loose and readily accessible sequestra have been removed. No major operations have been undertaken, however,

except in one case in which partial resection was performed. (This patient was subsequently discharged, free from symptoms with exception of some persistent fistulæ, but died later, according to information, from peritoneal tuberculosis).

As it is possible that in the future a more surgical treatment may become the routine method (such treatment having at least been considered), I feel justified in submitting the results of the treatment hitherto employed. These results are set down in the following tables, which show, firstly, the immediate results obtained (on discharge), and, secondly, the end results. The after-examination has been carried out by means of question blanks. The replies were generally such as to leave no doubt as to the state of health of the patient concerned. Unfortunately some of the patients could not be traced. Finally, there is a table showing the duration of the disease in those cases in which there did not simultaneously with the tuberculous affection of the iliosacral joint exist any other tuberculous manifestation that might have had an unfavorable bearing on that duration.

SUMMARY

The author submits an account of some of his experiences from the Apelviken Coastal Sanatorium, of cases with disease of the iliosacral articulation, with special reference to 66 cases of tuberculosis, followed by a tabulated account of the result of treatment in these 66 cases.

Table 1.
Immediate results of hospital cure.

	Dry cases	Abscess cases	Fistula cases	All together
Died in hospital	1 miliar-tbc	2 1 pneumonia 1 cerebellumtbc	3 1 amyloid 1 intestin. tbc 1 unknown reason	6
Left hospital free from symptoms	15 1 died later (meningitis)	9 1 died later (meningitis)	11 1 died later (peritonitis) 1 got later Th-spondylit.	35
Left hospital with remaining trouble (lameness, pain caused by exertion & so on but able to work at certain trades)	2	2	3	4
Left hospital without symptoms except for persistent fistula				3
Left hospital unaltered or worse	0	0	2 later both died of amyloid (?)	2
Still remaining in hospital	7 3 without symptoms 1 with slight lameness 3 still in bed (one of whom is very ill, amyloid)	0	9 3 without symptoms-with fistula cured (one of whom is still in bed with a different illness) 3 without symptoms but persistent fistula 3 still in bed	16

42
left hospital in good condition and able to work

Table 2.

Late — results concerning those who were under observation for at least 1 year afterwards.
 (37 cases)
 Of other 29 patients 6 died before leaving hospital, 16 remain and 7 are free from symptoms, but have been under observation less than 1 year.
 Longest time of observation 11 years. Average time of observation 3 years.

	Dry cases	Abscess cases	Fistula cases	All together	
Dead	1 meningitis	1 meningitis	3 2 amyloid 1 unknown reason	5	Total (including those who died in hospital) 11 deaths
Not after-examined	2	2	2	6	
Free from symptoms	8 1 has tbc of lung 1 kidney-tbc	5	7 1 got Th-spondylit after leaving hospital	20	26 free from pain concerning ilio-sacral joint 7 free from symptoms but under observation for less than 1 year
Nearly free from symptoms (slight lameness, pain from exertion etc.)	2	2	1	5	10 free from symptoms but remain in hospital 6 still in bed
Free from symptoms except for persistent fistula	—	—	1 complicated by cong. hip luxation	1	
Ill	0	0	0	0	

Table 3.
Length of illness
in cases of isolated iliosacral tuberculosis from the first beginning
of the symptoms.

	Dry cases	Abscess cases	Fistula cases	All together
Longest time of illness	46 months	51 months	108 months	68 months
Shortest time of illness	10 months	10 months	13 months	11 months
Average time of illness	21 months	22.5 months	40 months	27.8 months

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XXXVIII.

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(Authors and literature not appearing on this list are quoted at second hand).

DISCUSSION:

Robert Hanson, Varberg:

Dr. *Sisefsky's* dissertation clearly shows that the conservative treatment used here for tuberculosis of the ileosacral joint gives particularly good results in the way of healing. I have only once made resection of a considerable portion of the joint - in the case of a woman who had lain here for several years with fistulæ. She was discharged almost cured. A year after her discharge she died from peritonitis.

In one case I have made an extra-articular fixation. The patient was a woman, 27 years old, whose nerves would not stand a more lengthy, conservative treatment. She is still under treatment here, having been admitted March 13th, 1932 (Journal no. 606/32). Three or four years ago she was in the service of an elderly lady with a »fully healed« tuberculosis of the lungs. During that time she became ill and developed erythema nodosum; afterwards she was well again until February, 1931, when she once more got this same erythema. Toward the end of that month she gave birth to a child. The following day, tuberculides appeared on her skin. In the beginning of April, 1931, she had some pains along the back side of her left thigh, which disappeared, however, after two weeks. After another six weeks they came again, and she consulted a doctor, who diagnosed ischias and prescribed massage and thermotherapy. This treatment was kept up until October of the same year, when there developed a swelling, with fistulation, over the first phalanx of her left great toe. A surgeon whom she consulted made an operation for spina ventosa. After the tuberculosis of

the toe had been discovered, several roentgen examinations were made of her spine and pelvis, and finally tuberculosis was found in the left sacroiliac joint and in the first and second sacroiliac ligaments.

The roentgenograph here, of the left sacroiliac joint, taken March 14th, 1932, shows a distinct wearing down, in the lower part of the joint, both of the iliac bone and the sacrum. As the woman's psyche, as I have already explained, made it necessary that something positive and unmistakable should be done in the way of dealing with her disease, I operated, on August 4th, 1932, using a method devised by myself, and which has not, to my knowledge, been published before. A curved incision was made from the posterior superior iliac spine, following the medial margin of the iliac bone to the lower part of the sacroiliac joint. The attachment of the glutæus maximus muscle was loosened from the iliac bone, taking the periosteum with it. A tongue of bone, about 1.5 cm. long and 0.5 cm. thick, was chiselled out from the posterior superior iliac spine in such a manner that it remained attached by its base. A superficial cortical layer was then chiselled loose from the arch of the first and second sacral vertebræ and lifted up, and the tongue from the iliac bone turned down and placed over the bare spongiosa, where it easily became fastened. In the same sitting, Albee's operation was made for the lumbar spondylitis.

If I have mentioned this method, it is because the execution was easy; and because, theoretically, it ought to give at least as good a result as other, more intricate operations already published.