

H. NILSONNE, STOCKHOLM:

SOME VIEWS ON THE PROBLEM OF SCIATICA AND SCIATIC SCOLIOSIS

In recent years I have taken a particular interest in sciatic scoliosis, a condition which in our clinic has increased enormously in frequency. In 1930 *Wahren* published our sciatic material amounting to some 50 cases (from a period of about 5 years). The material I have now prepared comprises 100 cases and refers to the past 18 months. This increased frequency is, I suppose, explained by the fact that the internist more and more begins to refer this kind of case to the orthopaedic surgeon.

I have been unable to enlarge my investigation to include all the cases of sciatic scoliosis seen here since it was only at the beginning of the period including the 100 cases that my attention became especially drawn to this condition, and since for solving the mechanism involved in the sciatic scoliosis it is necessary carefully to examine the state of the muscles and to record the mobility of the back and lower extremities. Nor has it been possible to make use in this respect of any earlier literature on the subject as earlier authors have generally been engaged only with neurological and static investigations while such of methodical dynamic nature are lacking. Although my material of 100 cases is statistically too limited to permit of any wider deductions, it may nevertheless serve as a background against which a few reflections may be made on the nature of sciatic scoliosis along a line that I have believed to be accessible to critical examination.

The 100 cases of sciatic scoliosis examined have all been cases of sciatica or lumbo-sciatic complexes with scoliotic or kypho-

scoliotic deviations of the back, all of them subjected to active corrective treatment. The data appearing in the literature on the frequency of sciatic scoliosis in cases of sciatica are not much to go by. *Steblov-Ossetinsky* state that 16.2 % of all sciatic cases hold their backs in a strained position. It depends of course entirely upon what claims we make in assessing deviations from the normal shape of the back. If we only observe the back in the standing position of rest *Steblov-Ossetinsky's* figure may perhaps represent the true state of affairs. But if we consider the back and the »sciatic leg« as a functioning whole then practically speaking every case of sciatica has a »sciatic scoliosis«, not always in evidence on examining the static but well enough on examining the dynamic factors. Thus it happens that a perfectly straight »sciatic patient« may show on bending forwards a marked deviation of the trunk, or such may appear on different rotatory positions of the hips. A case of sciatica must be examined not only in reclining position but also in standing position and during different movements of the trunk; this gives us much more valuable information about the case than otherwise would be the case.

There would seem no doubt that in some cases there is at the back of a sciatic complex a polyneuritic kind of affection with fever and raised sedimentation reaction in the blood (*Kahlmeter*). Further a purely neurogenous genesis can probably be traced in cases with symptoms of caudal meningitis (*Brahme*). That the main group of cases however is to be referred to the sphere of muscular conditions, about this there would seem to be general agreement among most orthopaedic surgeons.

Sciatic scoliosis is no uniform conception, on the contrary one finds in this group exceedingly varying types of functional disturbances. These various types probably depend upon different locations of the nerve entry in the muscular apparatus. If we wish to explain the phenomenon purely neurogenously, various conditions of tension and pain may be considered at the exit of the sciatic nerve between the gemellus sup. and the piriformis, this exit being changeable on varying degrees of tilting of the pelvis. We shall find however a much more natural ex-

CASE 1.

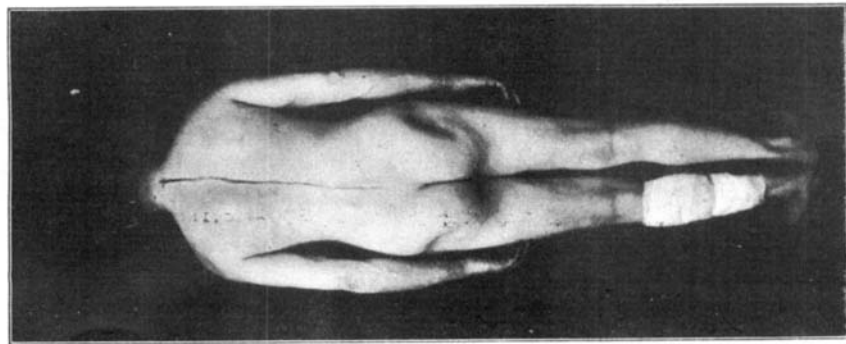


Fig. 1. Scintic left.
Heterologous scoliosis.

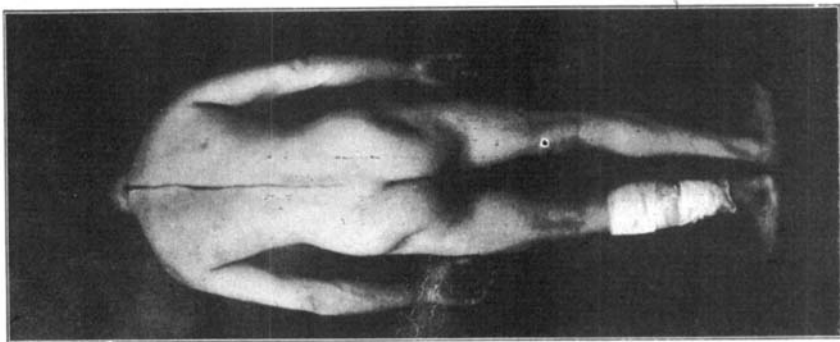


Fig. 2. Outward rotation of
the hip.

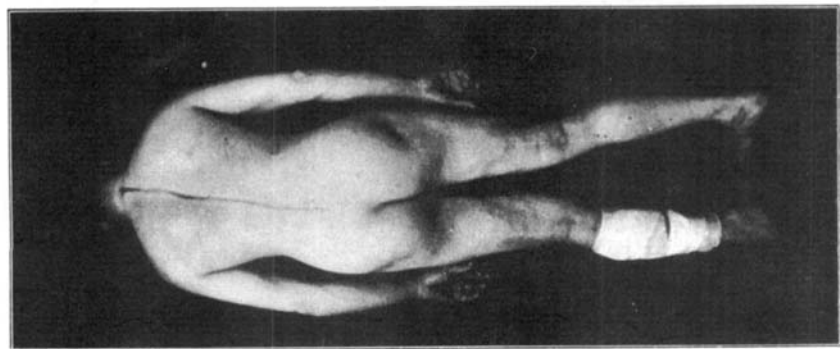


Fig. 3. Inward rotation of
the hip.

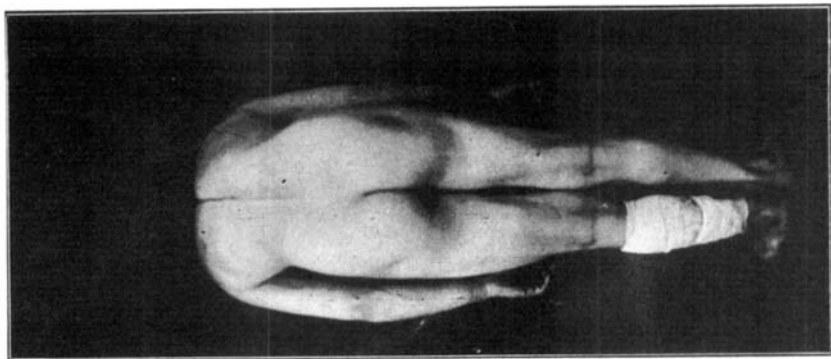


Fig. 4. Forward bending.

CASE 2.

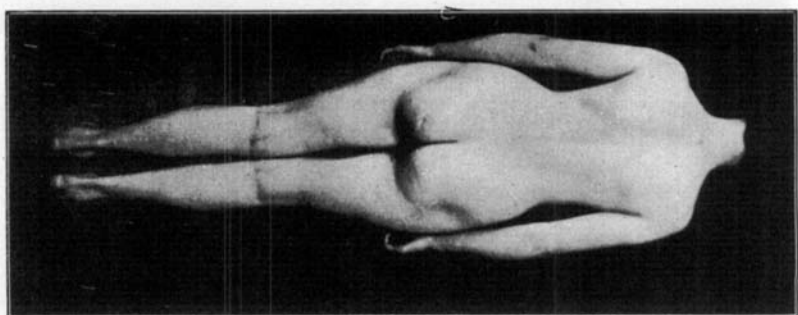


Fig. 5. Sciatic left.
Heterologous scoliosis.

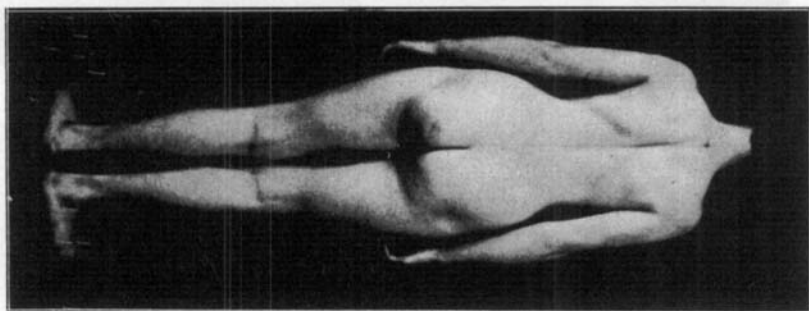


Fig. 6. Outward rotation of
the hip.

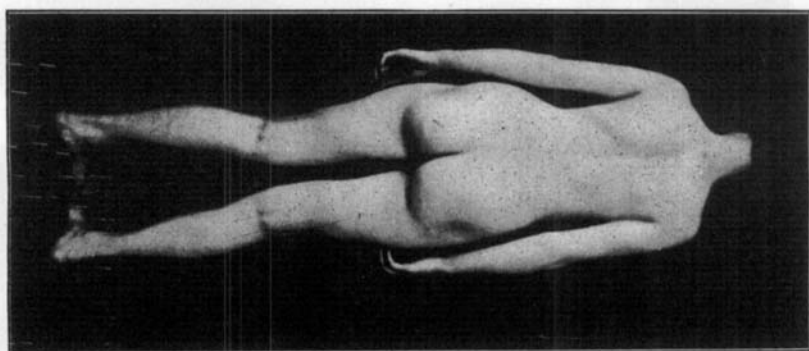


Fig. 7. Inward rotation of
the hip.

CASE 3.

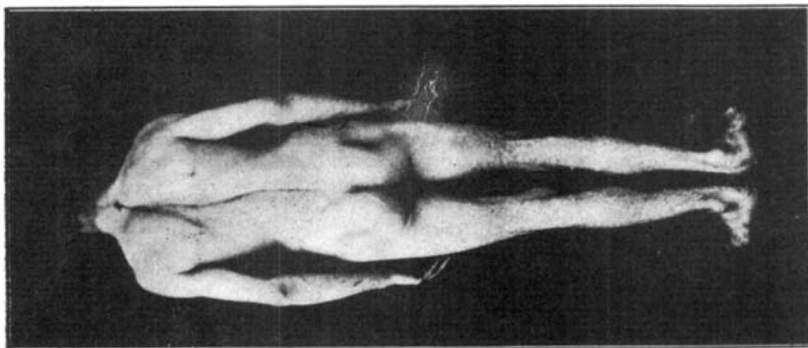


Fig. 8. Sclatic right.
Heterologous scoliosis.

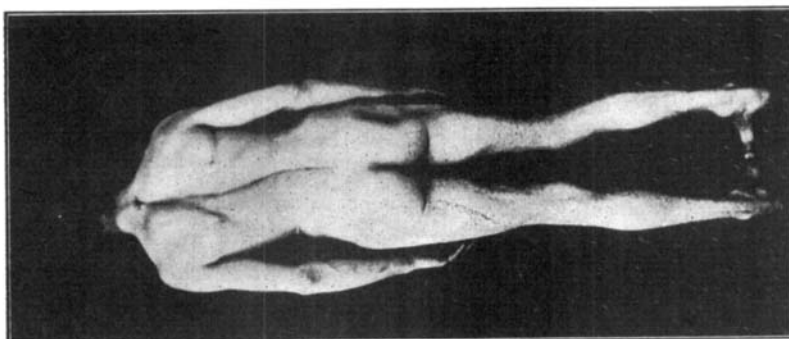


Fig. 9. Inward rotation.

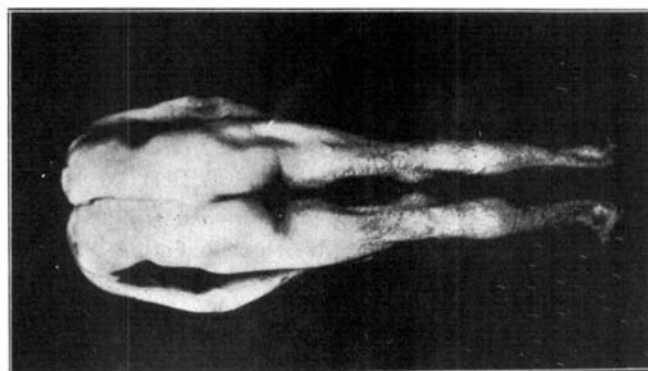


Fig. 10. Forward bending.

planation of the different types of strained posture of the back by studying the dynamic condition of a sciatic scoliosis and by regarding the scoliosis as a contracture of different groups of muscles.

In the cases under review the main types were as follows: heterologous sciatic scoliosis 76 %, homologous 22 % and alternating 2 %. It is generally found that no pronounced deviation occurs below the upper lumbar region, (L.I—L.III), a conclusion which also *Wahren* arrived at, while the lower lumbar region is straight in the vertical plane. On the other hand we generally here find a kyphotization and above that, in the upper lumbar and lower thoracic region, a compensatory lordosis. The saddle-back would thus seem to have been shifted upwards.

On bending forwards in standing position the lateral deviation was increased in 38 % of the examined cases; in 51 % the deviation diminished or entirely disappeared and in 11 % conditions were uncertain. In such cases where the deviation diminished on forward bending (fig. 4) an interesting and fairly constant phenomenon was observed on different hip rotations. Thus on inward rotation the lateral deviation was found to increase and sometimes also the kyphosis. Often the »sciatic leg« could not be rotated inwardly as much as the sound leg (fig. 3). On outward rotation, on the other hand, deviation diminished (fig. 2). The patient was generally feeling more pain in a position of inward than outward rotation. On the other hand in reclining position with flexed hip the patient reacted very rarely to inward rotation.

The strained posture of the trunk in »sciatica« is, I suppose, to be regarded as a protective position, a kind of 'défence musculaire' against the pains. As is well known there is always in the sciatic cases a region of maximal pain below the posterior iliac spine in the origin and upper part of the gluteus medius. The lateral deviation of the trunk might perhaps be explained by an effort on the part of the patient to unload the abductor musculature with its nerve supply (»myogelosis«, *Lange*), above all in the gluteus medius. The majority of cases of sciatic scolio-

sis are heterologous. The patient brings the trunk over to the sound side in order to shift the body weight on to the sound leg, so as to reduce during walking the work of the gluteus medius for stabilization of the pelvis. This would appear functionally to be the most natural way of switching off the abductor apparatus of the hip. Yet the same object would seem to be attained by deviating the trunk to the same side as the affected hip (homologous sciatic scoliosis) when the pains on movements are relieved through relaxation of the gluteus medius (increased abduction of the hip!). This strained posture will before long become fixed and the whole pelvic and back musculature will be found more or less contracted. This crooked position may become fixed even in the course of a prolonged stay in bed. The patient may then be found with a deviation of the trunk no smaller than in standing position.

There is generally also a mild kyphosis in sciatic scoliosis, chiefly in the lower and middle lumbar region. If this is to be regarded as a contracture, the cause must be sought in the muscular apparatus in front of the vertebral column. The kyphosis concerned is limited above at a level corresponding to the origin of the iliopsoas. Above this the high compensatory lordosis commences. In this relation I have not earlier heard the iliopsoas mentioned except by *Plate*.

On the following grounds, however, I find it extremely likely that the iliopsoas also has to do with the scoliosis. In those cases where on bending forward the lateral deviation disappears or diminishes the same thing happens on outward rotation of the hip, while the deviation is increased on inward rotation. This can probably be referred to the iliopsoas which is relaxed on flexion of the trunk as well as on outward rotation of the hip. Similarly it is often observed in these patients that in standing position there is less inward rotation of the affected hip than on the sound side. On abdominal palpation in supine position of these patients one also sometimes finds distinct deep tenderness over the psoas recess and in prone position there is pain on attempt at hyperextension in the hip, just as in cases of psoas abscess. In those cases where the deviation is increased

on forward bending the muscular contracture is probably mainly localized to the muscular apparatus behind the vertebral column. It may be the long extensors of the back on the side of scoliosis which in their secondary contracture prevent the spine from bending straight forwards; the greater the flexion of the trunk, the more the back deviates to save the muscles of the same side.

The alternating sciatic scoliosis presents an exceedingly strange picture. The back, rapidly passing the intermediate position, can passively be brought from the one position of deviation to the other. It reminds one of the way the rounded lid of a tin may be flopped in and out. It gives one the impression of the spine being a mast supported by two lateral stays which are too taut, thereby preventing it from occupying a straight position. The iliopsoas is the muscular apparatus which in its course mostly resembles such stays.

It is a very ticklish undertaking to give a dynamic analysis of sciatic scoliosis. The views I have submitted here is but an attempt to bring the discussion to bear upon the problem of contracture which I believe, from what clinical experience has taught me, to be the central one in our efforts to understand and treat cases of sciatic scoliosis.

DISCUSSION:

Kj. Bergman, Malmö:

According to the opener the reason why sciatic scoliosis would take on a different appearance on outward and inward rotation of the hip would be that the iliopsoas muscle is an outward rotator of the hip-joint. This muscle however would seem more likely to be an inward rotator. In Broman's »Människans rörelseapparat«, one of the most reliable works we have on this subject, this muscle is included among the inward rotators, and this is also what a priori is to be expected. The axis of motion in rotation does not lie in the long axis of the femur but passes from the centre of the head of the femur obliquely down and outwards, thus in its course situated on the inner aspect of the lesser trochanter where the psoas is inserted. Consequently when this muscle contracts inward rotation must follow. Why the

scoliosis should vary on outward- and inward rotation of the hip is hard to explain but is probably due to some painful condition in either this or that muscle, or part of a muscle, thus greatly varying in character in the different cases.

H. Camitz, Gothenburg:

When discussing the pains of sciatica where a great many muscles are in a state of contracture one should not forget that all such musculature is cyanotic; I have often been able to convince myself of this fact when doing myotomy of the pectineus in cases of *malum coxae senile* in which cases the musculature is never of normal appearance but generally more or less blue.

H. Nilssonne, Stockholm:

In all anatomical text-books I have read the iliopsoas is stated as an outward rotator. I was not aware of its being given as an inward rotator in *Broman's* publication.

In operations on the hip-joint when one wishes to slacken the tendon of the iliopsoas this is done by rotating the hip outwards; I should have thought this was in favour of the muscle being an outward rotator.¹⁾

¹⁾ Since this had been put down in writing I questioned Professor *Broman* as to the function of the iliopsoas. He stated he could give no definite answer to my question; he emphasized that the function of the iliopsoas was very difficult to analyse and that the problem required further special investigations.