

negative result, as was also the diazo reaction for the urine. The chest was aspirated for the last time on October 19th, much less fluid being found than on the previous occasions. The patient now became gradually weaker and more emaciated, suffering occasionally from alarming attacks of syncope. She died during her sleep on December 2nd.

At the *post-mortem* examination the following observations were made:

Abdomen: Intestines everywhere roughened with nodular chronic granulations and coated with a layer of lymph, the intestinal coils being adherent and the omentum thickened.

Liver enlarged and fatty, pale in colour, and showing the characteristic appearances of passive congestion.

Kidneys and spleen normal.

Chest: The pericardium was greatly thickened and its cavity completely obliterated by firm fibrous adhesions between its two surfaces. The orifices of the superior and inferior venae cavae were contracted.

The right pleural cavity was obliterated by adhesions, the lower lobe of the lung being congested, oedematous, and partly collapsed. The upper lobe was congested and studded with small hard tuberculous nodules. The left pleural cavity was obliterated in its upper half by pleuritic adhesions, and shut off from the lower part, which contained about a pint of serous fluid. The lower lobe of the left lung was collapsed, and the upper lobe contained the same tuberculous-looking nodules as the right lung. They were arranged in scattered groups, but had all the appearance and consistence of tuberculous nodules.

Portions of the peritoneal nodules and the pulmonary tissue sent to the Clinical Research Association for microscopical examination presented the typical appearance of tuberculous disease.

The clinical course of this case presents several unusual and interesting features, especially when viewed in the light thrown upon them by the autopsy.

Thus the rapid subsidence of the signs of pericarditis would at first sight render the extensive thickening revealed after death a matter of surprise.

The enlargement of the liver during a portion of the progress of the case was so great that the edge could be felt well below the level of the umbilicus after the fluid had been withdrawn by paracentesis, but there was none of the tenderness usually associated with the cardiac liver. The subsequent diminution in size of the liver was also remarkable, since at the end of the illness its edge reached only about 3 in. below the costal margin on deep inspiration. During the earlier months of the illness the urine contained a large quantity of albumen, but latterly this practically disappeared. Various diuretic drugs were administered from time to time, the most successful being theocin sodium acetate, which in 5-grain doses twice a day produced a very abundant flow of urine, but was discontinued on account of the nausea and depression it appeared to produce. The injection of adrenalin into the pleural and peritoneal cavities was considered, but rejected on account of the risk to life, the writer having had a patient who died suddenly from cardiac spasm immediately after its use for recurrent pleural effusion. The question of the incision and drainage of the pleural cavity was also considered in consultation; but the probability of converting the simple effusion into an empyema, which might be slow to heal and would involve a serious drain upon the strength of the patient, led to its rejection.

The term "polyorrhomenitis" has been applied to a multiple suppuration of serous membranes by Italian physicians, and this condition was fully dealt with by Dr. Frederick Taylor in a paper in the BRITISH MEDICAL JOURNAL for 1900 (vol. ii, p. 1693), but in the case here reported no suppuration occurred. Many writers consider that recurrent pleurisy is almost always tuberculous, and this opinion is borne out by this case, notwithstanding the negative results of the various clinical and pathological tests.

DURING the past winter semester the number of students in the medical faculty of the University of Vienna was 2,334, of whom 125 were women. This number does not include 62 students who entered for particular parts of the curriculum; of these, two were women; or 238, of whom 9 were women, who attended special courses.

THE total number of legally qualified practitioners of medicine in the German Empire at the end of 1911 was 32,500. Taking the whole population of the empire this gives a proportion of about one doctor to every 2,000 inhabitants. The number of medical students in the universities of the empire during the past semester was 12,446, of whom 582 were women. The number of persons who passed the State Examination in the academic year 1909-10 was 945.

THE DIAGNOSIS AND TREATMENT OF SCIATICA.

WITH A NOTE ON THE METHODS IN USE AT
HARROGATE.*

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CASES of sciatica, for the purposes of classification, may be conveniently divided in the following manner:

A. *Primary Group*—

1. Sciatic neuralgia.
2. Sciatic perineuritis.
3. Sciatic neuritis.

B. *Secondary Group*.

Sciatic Neuralgia.

By sciatic neuralgia is meant a painful condition arising in the area of distribution of the sciatic nerve. As with other neuralgias, it is probable that there is no definite inflammatory change in the nerve trunk, the condition being purely functional. It occurs most frequently in flabby, anaemic, debilitated subjects, more often in women, and appears to be the expression of nervous exhaustion. Occasionally associated with dysmenorrhoea, or irregular menstruation, I have seen it alternate with facial neuralgia. Over-fatigue or mental anxiety will precipitate an attack. In such cases little is to be made out by examination. There is no muscular wasting, and neither movement of the limb, nor pressure on the "tender points" elicits the exquisite pain accompanying the other conditions. The pain is intermittent, and the patient, although the attacks may be very severe, is quite comfortable between them.

Sciatic Perineuritis or Neuritis.

This is a disease of adult life, and in my experience four times as common among men as women. There is almost invariably a gouty or a rheumatic history. The ordinary pathological changes of neuritis have been observed when the nerve has been cut down upon for the purpose of stretching. Exudation and effusion have been found in the sheath, swelling and redness of the nerve trunk, and occasionally small haemorrhages, these changes being most marked at the level of the sciatic notch and at the middle of the thigh.

The disease is, then, primarily a perineuritis, and the pain and tenderness are due to the irritation of the sheath nerves. As the disease progresses the nerve fibres become involved in an interstitial inflammation, and a definite neuritis supervenes.

In cases of fully developed neuritis muscular atrophy, paresis, and the reaction of degeneration are present, with diminution of tactile sensibility, areas of anaesthesia, and hyperaesthesia, tinglings, pins and needles, formication, etc.

The exciting cause of an attack of sciatic perineuritis—and one attack predisposes to another—is in the majority of cases the exposure of the limb to local cold, not dry cold, but cold associated with wetting—for example, sitting on wet grass or upon a damp seat.

Special attention must be directed to the association between lumbago and sciatica. How common is the history of acute pain in the lumbar muscles, followed in two or three days by sciatic pain—in other words, a spread of fibrositis and involvement of the nerve trunk.

It is stated that direct pressure on the nerve by sitting in an uncomfortable position sometimes causes sciatica, as, for example, in the city clerk, dangling his legs from a high stool. In the case of two patients who had always been accustomed to wear woollen underclothing, the attack was attributed to changing to linen and silk respectively.

Secondary Group.

In this group are included all those cases in which the condition is due to involvement of the sciatic nerve by pressure, or the spread of inflammatory processes. Hence the importance of making a complete and systematic examination before diagnosing primary sciatica. It is stated that a rectum overdistended with scybalous masses sometimes exerts sufficient pressure to give rise to sciatica,

* Paper read before the York Medical Society on February 14th, 1912.

but whether this be so or not, it is at any rate quite sufficient to aggravate the condition if already present. Intra-pelvic causes which must be excluded are sarcoma of bone, carcinoma of the rectum and uterus, fibroids, ovarian tumours, and pelvic inflammation.

Growths of bone are readily detected by local examination. Sciatica is of particular importance as a symptom of recurrence after removal of a primary growth of the rectum or uterus (the cervix especially) when no local recurrence with discharge, etc., has occurred. Fibroids and ovarian tumours rarely give rise to sciatica, and then only when there is impaction in the pelvis. Pelvic inflammation may be the cause, either by pressure or by the involvement of the nerve sheath by spreading inflammation. In the field of obstetrics, pain of the nature of cramp down one or both legs is quite common when the head enters the pelvis. Sciatica or paralysis is rare, probably because the promontory of the sacrum and the pyriformis protects the plexus. Occasionally, however, in a small round pelvis, when the head fits the pelvic cavity tightly like a cork in the neck of a bottle, the lumbo-sacral cord is damaged by pressure against the pelvic brim. Agonizing cramp, with paralysis of the external popliteal branch, may result; this may occur also after delivery from pelvic inflammation. It may be noted that separation of the sacro-iliac synchondrosis during childbirth sometimes produces a lameness loosely simulating sciatica, which may persist for some time.

The secondary group also includes those cases of sciatica due to tuberculous or osteo-arthritis disease of the spine, bones of the pelvis or hip-joint. Special attention to the association between sciatica and osteo-arthritis of the hip-joint has been directed by Dr. William Bruce in an address on "The Real Nature and Rational Treatment of the Disease";¹ and later, in a paper entitled, "The Relation between Sciatica and Diseases of the Hip-joint,"² read before the Medical Society of London, Dr. Ironside Bruce brought forward a number of radiograms, revealing evidence of chronic arthritis in patients who had the signs and symptoms of sciatica. A partial form of osteo-arthritis involving one hip-joint alone is not uncommon, and I have notes of nine such in my series of cases of so-called sciatica. All these cases were elderly men, and there was a definite history of trauma in each. The sciatica was of a chronic nature, had never been acute, the patients walked with a limp, and there was present in all more or less muscular wasting of the buttock.

A highly nervous lady, 40 years of age, complained of very severe sciatic pain in the left leg, which I was inclined to consider a neuralgia. An x-ray examination revealed the presence of a bony outgrowth from the femur at the junction of the upper with the middle third, and periostitis.

It is always advisable, and particularly in cases which prove intractable, to have a radiogram taken.

The exclusion of diseases of the spinal cord, peripheral neuritis, Bright's disease, diabetes, etc., does not as a general rule present much difficulty, as primary sciatica usually involves one side only.

A gentleman, 45 years of age, who had been confined to his bed for three weeks previously, came to Harrogate to take treatment for what appeared to be a very acute attack of primary sciatica in the left lower extremity. Four months before I saw him he had contracted gonorrhoea, but the urethral discharge had ceased. There was no muscular wasting, but the slightest movement or exposure of the limb caused excruciating pain, only to be controlled by hypodermic injections of morphine. Five weeks later he began to have pain in the right leg, bladder symptoms quickly followed, and the case soon presented the clinical picture of myelitis, from which he died five months after the onset of his illness.

The pains of *tubæ dorsalis* are often felt in the sciatic area, but their fleeting character and the presence of other signs of locomotor ataxy should prevent any error in diagnosis.

Treatment.

In acute cases absolute rest in bed is essential, and the problem is how to make the patient as comfortable as possible. A water bed is advisable, and the sheets must be either woollen or cotton, not linen. Woollen socks and pyjamas should be worn. I usually fix the limb with a long Liston splint, which adds greatly to the comfort of the patient when he has become accustomed to it, and does away with the startings which are such a painful feature of the disease. Should this prove unsatisfactory, slinging the leg in a Salter's fracture cradle is worthy of a

trial. It sometimes acts admirably, and has the additional advantage of permitting local treatment to be adopted more readily. The limb must be kept very warm. It is a good plan to swathe the leg in ordinary or thermogen wool, fixing with a domette bandage.

In subacute cases a few days' rest with the limb on pillows and between sandbags may be necessary.

It is wise, and particularly in gouty cases, to begin the treatment of acute cases with a dose of calomel, followed by a saline in the morning. As to drugs in general, their effect is very uncertain in sciatica, but in many cases they are most beneficial. In acute cases the salicylates in combination with the bromides and tincture of gelsemium answer well. Aspirin appears to have a specific effect in relieving the pain of fibrositis; and pyramidon, exalgin, acetanilide, and phenalgin are worthy of mention. Potassium iodide is a most valuable remedy, more particularly in chronic cases, especially when combined with the glycerophosphates. Tonics (iron, arsenic, strychnine, etc.) are very necessary when the acute symptoms have subsided.

Regarding local treatment, many pin their faith to flying blisters; the disadvantage is that if not effective they interfere in a measure with the adoption of other methods of treatment. Hot linseed poultices, antiphlogistine, a canvas bag containing mustard bran, electra cloth applied along the course of the nerve, are all good methods of counter-irritation.

Anodyne colloid is excellent for relieving local pain, and particularly if the alkaloids it contains are brought into activity by applying a piece of moist spongiline over the collodion film. The A.B.C. liniment or the compound chloral paint (which contains chloral hydrate, camphor, menthol, and thymol) painted on the painful areas with a brush form valuable remedies. Methyl salicylate, to which may be added tincture of iodine and menthol dissolved in paragon, or made into an ointment with vasogen, is a favourite application of mine. Mesotan, or 1 to 3 drachms of spiroal in $\frac{1}{2}$ oz. of rectified spirit, are of service in fibrositis. Morphine may be administered hypodermically, but the danger of the patient acquiring the habit of self-administration, particularly in neuralgic cases, must not be overlooked. For the first few nights of an acute attack suppositories containing $\frac{1}{2}$ grain of morphine act well. But I know of no remedy of greater value in relieving the very acute pain than cocaine administered hypodermically in doses of from $\frac{1}{4}$ to $\frac{1}{2}$ grain. This should be injected at the seat of the pain but not into the nerve. It is said that injections of plain water often gives relief, but this cannot be in cases of acute sciatic perineuritis.

Dr. Wilfred Harris³ reports good results from deep injections of strong alcohol "in cases of fibrositis of the buttock which simulate sciatica, and may precede, and then accompany, sciatic perineuritis." He points out the importance of not injecting the alcohol into the nerve, or paralysis will follow. He also uses a modification of Lange's infiltration of the nerve with warm normal saline solution and eucaine, reporting in a series of 34 cases of chronic sciatica 24 completely cured and 3 considerably improved. Fibrolysin I have never found of any service.

Balneological Treatment.

I do not propose dealing with the internal administration of natural mineral waters, but wish to draw attention to the various methods of balneotherapy which are adopted at Harrogate. Naturally, the majority of cases which come under observation are of the nature of chronic sciatica.

In the Greville hot-air bath, designed for the application of local dry heat, the heat is generated by the passage of an electric current through high-resistance wires fitted in suitably shaped cases and insulated from the patient, and conveniently adapted for application to the lumbar region and the lower extremity affected. The limb is lightly covered with a layer of lint and submitted to a temperature of 300° to 400° F. for from twenty to sixty minutes. In the Dowsing radiant light and heat bath the heat is generated by electric heat lamps fitted in specially made aluminium reflectors. The patient lies on an asbestos sheet placed on a bed surrounded by the lamps, the body being covered with asbestos to keep in the heat. The temperature is raised to 250° to 350° F. It is claimed that the addition of the light to the heat rays increases

their therapeutic effect. Both the Greville and the Dowsing baths are useful in relieving pain, but in the treatment of chronic cases I have found them disappointing.

Hot sulphur immersion baths are often given combined with subsequent local treatment consisting of mustard packs placed down the sciatic nerve.

Mud baths, which are to all intents and purposes a universal poultice, are one of our most valuable methods of treatment. They are made from peat obtained from the Yorkshire moors; it is broken up in a mechanical mixer to the consistency of thick pulp, and afterwards raised to the required temperature by superheated steam.

Electrical Treatment.

For cataphoresis, the skin must first be cleansed with ether soap, and dried, any abrasions present being covered with a film of collodion. A leaden electrode, 8 in. to 12 in. long by 4 in. wide, and covered with eight to twelve thicknesses of lint soaked in a 1 to 2 per cent. solution of chemically pure sodium salicylate, is fixed along the course of the sciatic nerve over the lower part of the buttock and the back of the thigh. It is connected with the negative pole of a galvanic current. The inactive pole, which should be the larger of the two, is likewise covered with several thicknesses of lint soaked in a saturated solution of lithium carbonate, and placed in a convenient situation, for example, across the shoulder blades, and afterwards connected with the positive pole. Salicyl ions are electro-negative, and consequently flow from the negative to the positive. The current strength is increased until the patient feels it; in practice $1\frac{1}{2}$ to $2\frac{1}{2}$ milliampères per square centimetre is the strength of current employed. It is not satisfactory to apply the inactive electrode in the neighbourhood of the ankle, because of the unevenness of the surface and the consequent difficulty of preventing electrolysis. As an alternative to this, if it be desired to confine the flow of the current to the affected limb, it is a good plan to immerse the foot and the leg up to the middle of the calf in a weak solution of lithium carbonate contained in a deep foot cell, this being connected to the positive pole of the galvanic supply. If a continuous current from the mains is available, all that is necessary is a shunt switchboard fitted with a milliampèremeter; but if the town's supply be an alternating current, a rotary converter to transform the alternating to a constant current will be required. If no electricity be available, a battery of 20 to 30 dry cells, fitted in a suitable case, with double cell selector, and milliampèremeter is all that is necessary. This forms a rational, and in my experience a very successful, method of treatment of chronic sciatica. Where the condition is associated with lumbar fibrositis, the administration of iodine by ionization, using a 1 to 2 per cent. solution of either sodium, potassium, or lithium iodide, is more useful than the salicylates.

The high-frequency current is sometimes of service in cases of sciatic neuralgia. It is usually applied by auto-condensation, followed either by bipolar massage or the *effleuve*. For the former the patient lies on his side on a couch, holding the handles in connexion with one pole of the high-frequency apparatus, the other pole being connected to the attendant by means of a wristlet. The method of administration is by light massage to the affected area through one thickness of clothing, causing slight sparking, which increases the local reaction. For the *effleuve* a brush with metallic points in electrical connexion with a high-frequency resonator is held 4 to 5 in. away from the patient and made to travel up and down the sciatic nerve.

If the galvanic current be adopted, and it can be used with advantage at the acute stage, the stable electrode is placed between the shoulders and the mobile electrode applied to any specially tender spots. It may also be administered in a full electric immersion bath. The patient lies in a bath of plain or sulphur water at a temperature of 98° to 102° F., in which is fitted at the head a large copper electrode and at the foot two smaller electrodes, one on each side of the bath.

Dr. Schnee's four-cell bath, in which the hands and feet are placed in four separate receptacles containing water, is an improvement on the electric immersion bath in that the dosage the patient gets is under the absolute control of the

operator. The cell containing the foot of the affected leg is connected to the negative end and those containing the other leg and arms to the positive pole so as to control the flow of current and local action to the affected limb.

The sinusoidal current, which is an alternating current and differs from the galvanic in that its polarity changes with great rapidity, is chiefly indicated in cases of sciatic neuritis, the galvanic in sciatic perineuritis.

Massage douching, on the Aix or Vichy principle, is so well known that no description is necessary. Combined with the Scottish douche, alternating currents of hot and cold water on the spine and leg, it forms a valuable method of treatment in chronic cases, but should not be permitted until pain and tenderness have disappeared. The same remark applies to dry massage, which is of distinct service in preventing the formation of adhesions. The masseur must proceed very cautiously, confining his attention at the beginning to attempting to improve the nutrition of the muscles. Passive movements should be employed as soon as possible. With the patient in the recumbent posture, the thigh is flexed upon the abdomen, first with the leg flexed, and then with the leg extended. Abduction and external and internal rotation in various combinations are part of the daily treatment. With improvement these movements become less passive and more active. A very useful exercise consists in rising from a low couch or seat, on which the patient sits with both feet on the ground, at first with the aid of the masseur, and as the need for assistance lessens steadily decreasing the height of the seat until he can rise unaided from a footstool.

And, lastly, in cases which have resisted all other methods of treatment, good results have been obtained from surgical treatment, and particularly so when dense adhesions have been discovered between the nerve sheath and adjacent tissues. The beneficial effect of nerve stretching is largely due to the breaking down of such adhesions. Of acupuncture I have no personal experience, save that I have seen several patients who have undergone this treatment with temporary relief only.

Regarding after-treatment, the patient must be cautioned to keep the affected limb very warm, and there is nothing better than woollen combinations made of double thickness in one leg. Cold, damp, or hard seats must be avoided, and, inasmuch as the exciting cause in so many cases has been in my experience sitting on the cold seat of draughty waterclosets, I always advise the patient to use a felt cover.

The cure of cases of chronic sciatica is oftentimes a very gradual process. In the beginning, with the patient lying on his back, it may not be possible, holding the heel, to raise the foot in the slightest from the couch without causing pain; but as the condition improves the leg can be raised higher and higher, and this incidentally affords a rough and ready, but on the whole accurate, indication as to the extent to which progress in recovery has been made. It is also well to bear in mind that, though the patient may consider himself so, he cannot be said to be completely cured and altogether free from the danger of a relapse until the thigh with the leg fully extended can be acutely flexed upon the abdomen without causing pain.

REFERENCES.

- ¹ Dr. William Bruce, *Lancet*, August, 1903. ² Dr. Ironside Bruce, *Transactions of the Medical Society of London*, vol. xxxi. ³ Dr. Wilfred Harris, *BRITISH MEDICAL JOURNAL*, October 2nd, 1910.

THE first International Congress of Comparative Pathology will be held in Paris in October next (17th to 23rd). The Congress, which is organized by the Société de Pathologie Comparée, will be under the presidency of Dr. Roger, Professor of Experimental Pathology in the University of Paris. Professors Bouchard and Chauveau are honorary presidents. In addition to them, the following are among the members of the Comité de Patronage: Professors Landouzy (Dean of the Paris Faculty of Medicine), Professors Achard, Blanchard, Chantemesse, Delbet, Letulle, Albert Robin, Widal, of Paris; Drs. Hallopeau, Jeanselme, Netter, and Tuffer, of Paris; Drs. Roux, Metchnikoff, and Borrel, of the Pasteur Institute, Paris; Nicolle, of the Pasteur Institute, Tunis; and Professor Calmette, of Lille. The Secretary of the Committee is Dr. Garnier, Physician to the Paris Hospitals; the General Secretary of the Congress is M. Grollet (42, Rue de Villejust, Paris), to whom all communications relative to the Congress should be addressed.