two, and best of all for quantitative work, as it requires a minimum amount of manipulation and is easily and accurately estimated.

4. Picric acid is very liable to error, especially quantitatively, being a color test. It requires a great deal of manipulation, is uncleanly, and in no way superior.

5. The indigo test is very liable to error, especially in high-colored urines, and very difficult to estimate accurately, as it requires considerable manipulation.

The 'Roberts' or fermentation test has not been considered, as it is uncleanly, does not show small proportions of sugar, and consumes a considerable time and trouble in application. It is, however, valuable over Fehling's in urine containing peptone, for here the copper tests are obscured greatly; though I have never been puzzled by this factor except in specimens of urine from one case of diabetes mellitus, cited above.

LOCOMOTOR ATAXIA; ITS DIAGNOSIS AND TREATMENT IN THE PREATAXIC STAGE.¹

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Locomotor Ataxia is the most frequent affection of the spinal cord. The preataxic stage, although easily recognized, is easily overlooked as the result of a hasty diagnosis. During this stage the disease is curable if appropriate treatment is instituted, otherwise the patient gradually drifts into the second or ataxic stage, when the derangement of the nervous system is so manifest that a mistake in the diagnosis is then hardly possible, for he falls into the hands of a specialist in diseases of the nervous system, only to be told that he is beyond the possibility of a cure.

The elements that enter into the diagnosis of the preataxic stage, therefore, are of momentous importance, and are: *first*, sensory disturbances, as lightning pains; *second*, disturbances in patellar-tendon reflex; *third*, disturbances in pupillary reflex; *fourth*, disturbances in vesical reflex; *fifth*, disturbances in sexual condition; *sixth*, disturbances in gastric functions; *seventh*, disturbances in mental action; *eighth*, disturbances in muscular functions. The first three are the most valuable diagnostic points, as regards the sensory disturbances, such as pains of a peculiar character, spots of hyperæsthesia and anæsthesia in the lower extremities, that are sudden, severe and transitory, the former are like electric shocks, violent blows, stabbing with knives or burning with hot irons, compelling on the part of the strongest men violent outbursts of emotional disturbances. The pains are often localized in spots upon the surface that a silver dollar will cover; they may last a few hours and then disappear as suddenly as they came, returning usually in other spots after an absence of a few months or years. They are sometimes situated deeply in the soft tissues or bones of the extremities; at other times they are not localized, but present all the appearances of ordinary neuralgia, and again in other cases the pains are entirely absent.

The condition of the reflexes constitute the most valuable aids to diagnosis in this disease. The Patellar tendon reflex is diminished or lost; there may be exceptional cases in which the knee-jerk is normal, but the writer has never as yet observed this. In such cases the sclerosis must have commenced above the lumbar enlargement. This reflex is probably absent in two per cent. of healthy persons. We must, therefore, know that the person under examination once possessed a normal knee-jerk to enable us to draw any pathological significance from its absence, and the ordinary method of eliciting contracture of the quadriceps femoris by tapping the ligamentum patellæ when one knee is crossed on the other is not sufficient. The patient should be placed on a table, in the sitting posture, with the legs hanging over the edge. In this position the presence or absence of the knee-jerk is much more readily detected. The reflex being absent, the next question to establish is as to the integrity of the muscular structure of the quadriceps femoris, which can be determined with electricity and mechanical stimulation. If the muscle has a normal response to faradization, or responds by contraction to a tap over its surface, the muscle is healthy and the sign is diagnostic.

The pupillary reflex is diminished, or lost. The iris may contract equally, or one pupil is dilated or normal, and the other contracted; but the loss of reflex action to the stimulus of light, and the absence of dilatation of the pupil to stimulus applied to the surface of the neck, with this loss of reflex accompanied by a normal condition in efforts at accommodation, is the most striking symptom. The pupil will dilate in a strong effort at distant vision, and contract in a powerful effort at close vision. Another common ocular disturbance is, temporary double vision. This may last only a few hours, disappear, and return in a few months; or it may continue a few days and not again appear. Color blindness is also very frequent, the ability to distinguish red and green being first lost.

The vesical reflex, at the very beginning of the preataxic stage, is variable; usually the bladder is irritable, but this soon gives place to diminished reflex acuteness, and instead of a frequent desire to urinate, the patient slowly drifts into a condition quite the opposite, so that there may be no demand for the performance of this function oftener than twice in twenty-four hours. This condition is accompanied by diminished tone of the bladder walls, so that there is difficulty in commencing the act, and the stream, instead of being projected forcibly forward, falls abruptly, or simply dribbles, and the patient is often unable to determine when the act is finished, except using his eyes to determine it.

The sexual condition of the preataxic stage is, first, one of irritability, but is soon replaced by a diminution of all desire and capacity for intercourse, which may, in turn, be followed by nocturnal emissions.

Gastric disturbance in the preataxic stage is manifested by attacks of violent nausea, persistent vomiting and pain. The writer has a case under observation in which gastric trouble has been the only

¹ Read before the Chicago Medical Society, March 16, 1885.

prominent symptom for five years. The patient, during all this time, has been treated for a variety of gastric derangements. The attacks recur at intervals varying from a few weeks to a few months. The patient also has dilated pupils, loss of patellar-tendon reflex, and occasionally has attacks of lightning pains.

The *mental condition* is usually altered in the pre-ataxic stage. The patient has fits of melancholy; he becomes morose and irritable, timid, and very emotional, and will shed tears on the least provocation. He loses, for a time, at least, his interest in business, and, to a certain extent, his usual ability in business transactions.

The *muscular system* in this stage is weak. There is no ataxia, but there is a sense of weight and weariness in the limbs, with difficulty in going upstairs. The condition is quite like that experienced in neurasthenia.

The foundation for the successful treatment of the pre-ataxic stage of this disease is *rest*—absolute, positive, and prolonged. The recumbent posture should be maintained for several months. This idea of rest in the treatment of locomotor ataxia is an innovation, but it is based upon the generally recognized scientific fact that a diseased organ should have its functional activity reduced to a minimum quantity; and this principle applies with as much force to the spinal cord as to any other organ. Rest, accompanied as it is by diminution of the nutrient activity of the nerve fibres, and by diminution in the calibre of the blood vessels, must be antagonistic to the pathological processes that have begun in the cord; but, as Weir Mitchell has taught in his treatment of hysteria, it is necessary to maintain the greatest activity of general nutrition, and to prevent muscular waste. The judicious use of massage and passive movements will often enable the ataxic patient to replenish the nervous system in the recumbent posture. The diet should be of the most nutritious character; cod-liver oil and the syrup of the hypophosphites are often of the greatest service. The condition of the emunctories should be constantly looked after. Electricity, in the form of the galvanic current of mild intensity, used after the method of general galvanization daily, is of service, and by its alterative and tonic properties will assist in modifying the pathological process. The spinal electrode should be large. The electric brush, with the faradic current to the back and lower extremities, will, by reflex action, assist in relieving the morbid condition, as well as in maintaining a more healthy condition of the parts during the treatment of rest.

Syphilis is probably the foundation of almost every case of locomotor ataxia; such, at least, seems to be the opinion of the majority of the best writers on this subject, as for example, Erb. In the experience of the writer, of the cases that have come under his observation, he is certain that the treatment of primary and secondary symptoms of syphilis was not sufficiently energetic or of sufficient duration; and there seems to be no doubt that the patients were thus predisposed to locomotor ataxia. To guard against the occurrence of locomotor ataxia after syphilis, mercury and iodide of potassium should be used boldly

and for at least two years after the development of the primary sore; in this way it is possible that every germ of specific trouble may be removed from the system.

Should locomotor ataxia have already begun, anti-syphilitic remedies should be used; mercury should be pushed to a point short of salivation, and the iodide of potassium given in drachm doses three times a day, or in larger doses if the patient can tolerate them. Iodide of sodium is often better tolerated, though it is not so efficient as the iodide of potassium. Effervescing Vichy salt is a desirable correction for these large doses of potash and mercury. In non-syphilitic cases, or in those which do not improve under anti-syphilitic treatment, nitrate of silver may be given with advantage in gr. $\frac{1}{4}$ or $\frac{1}{2}$ doses, combined with some excipient that will not decompose it. It should be administered before meals. A factor in an unsuccessful use of nitrate of silver is the difficulty of getting it into the blood without decomposition. The writer has successfully used the hyposulphite of silver hypodermically; it is particularly satisfactory in being unirritating; he has given gr. jss daily until gr. xc had been administered.

Another drug of undoubted value is ergot, in flj doses, three or four times a day. Cold baths, at a temperature of 65° to 70° Fah., are of service; but hot baths are very injurious, and should be avoided, as should the administration of strychnia. The writer has treated quite a number of cases by the plan mentioned above; some of these who were taken in the pre-ataxic stage have recovered entirely; others have regained lost functions, except, perhaps, the patellar-tendon reflex; but they are so much relieved that they are able to resume their business.

MEDICAL PROGRESS.

SURGERY.

CONTINUOUS TRACTION IN THE TREATMENT OF POTT'S DISEASE.—Dr. John F. Ridlon, of New York, referring to a recent article on this subject, by Dr. Buckminster Brown, in the *Boston Medical and Surgical Journal*, of July 3, 1884, reports the following case:

Patient, female; seven years old. Hereditary history, good. Four months ago her neck began to grow stiff, and soon head began to droop forward. No complaint of pain, and no crying at night noticed. The condition increased. The general health remained fairly good.

Examination.—The chin rests on the sternum, and at times is steadied by the hands. Voluntary movement of the head is impossible. Attempted passive movement in any direction elicits an anxious look but no complaint of pain; and the head is found to be held absolutely rigid by muscular spasm. There is a sharp angular kyphos at the third cervical vertebra. No evidence of abscess. The patient was put in bed on July 19, a Sayre's collar was applied, and from it a cord passing over a pulley at