supplement them, and thus from the sum of the experience of many this important question may be decided. If, as my limited experience seems to indicate, antitoxin by inoculation has the power of preventing infection, then assuredly has this disease been robbed of much of its terror.

THREE CASES OF FRIEDREICH'S DISEASE ALL PRESENTING MARKED INCREASE OF THE KNEE-JERK.

By GEORGE HODGE, M.D.,

Professor of Clinical Medicine, Western University, London, Ont., Canada.

FAMILY HISTORY.

THE father, aged 72, is living, and has always enjoyed excellent health, except that during the last fourteen years he has suffered from eczema of the legs, which has produced such a condition as to necessitate the use of crutches in locomotion. The mother died three years ago, aged 70, of what was supposed to be cancer of the liver, after an illness of four months. Previously to her fatal illness she had always enjoyed good health. The father and mother were first cousins; both temperate and free from any syphilitic or tuberculous history.

There were eight children in the family, three boys and five girls. The two eldest (boys) died of scarlet fever in childhood; the remaining six are still living, three of whom form the subject of this paper—two females and one male. Of the other three, one, aged 41, is married and is the mother of six children, the eldest of whom is 16 years and the youngest 2 years. The mother and children are all healthy. A second one, aged 37, is also married, and is the mother of one child, aged 18 months; both mother and child are healthy. The other sister, aged 42, is unmarried, and is said to be strong and healthy.

Careful inquiry elicits the fact that, with the exception of the three whose cases are about to be described, there is no relative who has ever had deformity of the feet or any peculiarity of gait.

CASE I.—M. W., unmarried, aged 44, is the eldest of the family living. When between 3 and 4 years of age she fell down stairs and injured her back, after which she was never so active on her feet as other children of her age, and had a peculiarity of gait. She went to school till she was 12 years of age, then helped with house work for seven or eight years, during which time the difficulty in walking gradually increased, till at the age of 20 she was unable to walk without supporting herself on some stationary object or objects. At the present time she cannot even stand without support. On attempting to do so she sways backwards, forwards, and from side to side, and would fall forward if left to herself. She stands equally well with eyes closed as with them open.

There is the characteristic deformity of the feet, which is very well shown in the accompanying cut. (Fig. 1.) There

Fig. 1.—Case I.

is not much wasting of the lower extremities (not more than can be accounted for by disuse). The muscular power is somewhat, but not greatly, impaired.

There is neither ataxia nor tremor of the upper extremities.

The muscles of the thenar and hypothenar eminences and also the lumbricales and interossei are atrophied, and the hands tend to assume the "bird-claw" shape. There is no tremor of the head. Lateral curvature of the spine is quite marked. Horizontal nystagmus is a well-marked symptom when the patient fixes on an object at either side. The pupils react normally both to light and accommodation. The visual field is not contracted. There is no dyschromatopsia.

Tactile sensibility, sensibility to pain and temperature, and muscular sense are all normal. The patellar reflex is markedly exaggerated on both sides. There is no ankle clonus; the plantar reflex is increased. The mind is unaffected, the patient being quite as intelligent as most people in her station in life. A slight change in speech is noticeable; it is slow and drawing.

The patient began to menstruate when 14 years old, and has continued to do so regularly till within the last six months.

CASE II.—S. W., aged 40, unmarried, attended school till she was 14 years old. She remembers that before she left school she had difficulty in walking, which she attributed to the fact that her boots hurt her feet. She was unable to get ready-made boots to fit her, in consequence of which she was taken to a shoemaker, who said that he would require to get special lasts made upon which to make her boots. There can be no doubt that the deformity of the feet existed prior to this. Even after she got boots to fit her she continued to have difficulty in walking, and this difficulty has steadily increased till at the present time she is unable to walk without the aid of both a cane and a crutch. She cannot rise from the sitting posture without aid, and when standing, if left to herself, she begins to sway about and would fall forward and to the left. She says she can stand better with her eyes open than with them closed. In walking her body is thrown forward and to the left, her feet are merely lifted off the ground (shuffled along the ground), she brings the anterior part of her feet to the ground first. The lower extremities are very well developed, but the muscular power is impaired, especially on the left side.

The feet are characteristically deformed, to a greater extent than Case I but to a less extent than Case III (see Fig. 2). There is no ataxia nor tremor of the upper ex-

Fig. 2.—Case II.

trémities. The hand grasp is much weaker than it should be, although the hand muscles are not atrophied as in Cases I and III. She can sew and knit, but says that she has noticed that if she attempts to cut out a garment the cut edge is zig-zag instead of straight. There is no tremor of the head. There is slight lateral curvature of the spine, not so marked as in Case I.

Horizontal nystagmus is evident when the patient fixes to either side. The pupils react normally to both light and accommodation. There is no contraction of the visual field. Tactile sensibility, sensibility to pain and temperature, and muscular sense are all normal. She says that the lower extremities feel numb, especially if they are cold. The patellar reflex is distinctly increased on both sides; the plantar reflexes are present but are not increased. Intelligence is unaffected. Her speech is affected, as indicated by the fact that her friends complain that when she talks they

do not understand her quite as well as formerly. She began to menstruate before she was 14 years old, and has continued to do so regularly ever since.

CASE III.—A. W., aged 39 years, unmarried, went to school till he was 15 years of age. Before he left school he complained of the difficulty of walking much in the same way as Case II, and found it necessary to have his boots made on special lasts. After leaving school he worked as a farm labourer till four years ago, when he had to cease work because of the difficulty of standing and walking, and weakness of his right hand. When sitting, he cannot rise without aid, but when on his feet he can stand for a short time without support of any kind, by keeping his feet wide apart and his body bent forward. When standing, if he closes his eyes he at once begins to sway from side to side and backwards and forwards, and would fall forwards and to the right if left unsupported. Three years ago he could walk without the aid of a cane, but since that time the difficulty of walking has gradually grown worse, till now it is impossible for him to take more than a few steps without using his cane. He is unable to walk across the floor without his boots on, because of the great tenderness over the heads of the metatarsal bones. In walking the heel of the left foot is thrown outwards, and when the foot is off the ground a tremor is quite noticeable. The lower extremities are fairly well developed. The feet are characteristically deformed. This deformity is greater than in either Case I or II. (See Fig. 3.)

Fig. 3.—Case III.

There is no ataxia nor tremor of the upper extremities. There is marked atrophy of the muscles of the right hand, which has now assumed the "bird-claw" shape (Fig. 4.)

Fig. 4.—Case III.

The thenar eminence of the left hand is quite wasted, and there is also slight wasting of the lumbricales and interossei.

There is no tremor of the head when the patient is sitting, but when he walks a tremor is to be noticed. There is no lateral curvature of the spine.

Horizontal nystagmus is marked when the patient fixes on an object at either side. The pupils are normal in size and reaction. There is no contraction of the visual field. Tactile sensibility is normal, as is also sensibility to pain. Sensibility to temperature is altered. The patient can recognise heat, but does not correctly recognise cold.

The patellar reflex is greatly increased in both legs. There is no ankle clonus. The plantar reflexes are much exaggerated. The cremasteric reflex on the right side is feebly present, absent on the left side. The abdominal and epigastric reflexes are absent.

The patient appears more stupid than either Case I or II, but this may be due to the fact that he is quite deaf. The speech does not appear to be at all changed.

A RESPIRATORY SYMPTOM OF TOBACCO POISONING AND ITS EXPERIMENTAL INVESTIGATION.*

By WILLIAM S. MORROW, M.D.,
Lecturer on Physiology, McGill University.

THE present paper is written with the object of describing and, as far as possible, explaining a certain peculiarity of breathing met with in cases of tobacco poisoning.

In the experience of the writer it is a very common symptom of excessive use of the "weed," as he has seen three cases in as many years exhibiting it to a marked degree, besides several others in which it was less characteristic. As considerable difficulty was experienced in finding a description of the symptom, it would seem to have been overlooked by most observers, and yet it is believed to be of considerable diagnostic importance. The following are short accounts of the three cases referred to above in which it was most typical:

CASE I.—In December, 1893, a medical student came complaining of palpitation on slight exertion. He said he had used tobacco freely since 11 years of age. While examining his chest his breathing was observed to be peculiar. He would take a deep inspiration, and then there would be little or no breathing for a considerable interval, followed by another deep inspiration. On inquiry he said he believed he often went a long time without breathing. At any rate, he was often conscious of taking a very deep inspiration. He was advised to give up tobacco altogether. He did not do so immediately, and was lost sight of for a time. When seen a year or more later he had given up the habit, and the peculiarity of breathing had passed away. It was this case which first drew my attention to the subject.

CASE II.—L. T., a boy of 14, small for his age, was first seen in December, 1895. He complained of pain in the left side, extending from the heart around to the back and down the left arm. It was sometimes severe enough to wake him up at night. His mother said he was restless and excitable, and ate poorly. He had smoked cigarettes for two years. While in the office peculiar heaving sighlike inspirations were observed. On being questioned he said he often breathed like that. Discontinuance of tobacco was enforced, it is believed, with success. He was seen at intervals after this, and the breathing did not become normal for over six months, during which the sighlike inspirations were frequently observed. The following case was only diagnosed by the light thrown on it by the two preceding.

CASE III.—In December, 1896, Mr. T., a medical student, came complaining of not being able to take a deep breath. The difficulty had come on three days before, and was increasing. He said he was not prevented by pain, but it felt as if the air would not go in. When asked to try, he seemed to succeed very well, and as he sat in the office he took at intervals deep heaving breaths. He was conscious of effort in doing so. Once he remarked that the air seemed to go in that time. There was no palpitation or pain in the chest or arm. The pulse was 70. He said at first that he did not smoke much, but afterwards admitted that he had smoked far more than usual during the preceding week. One afternoon he had smoked seven cigars, and he was not used to smoking more than one or two. He said also that he chewed the ends of his cigars. He was told to stop tobacco and to report progress, but he did not return. A brother practitioner has, however, seen him since, and tells me that the peculiar breathing only lasted a few days after the smoking was discontinued.

The only satisfactory description of this symptom that I have been able to find is in a paper by Chapman, of Louisville, read at the Mississippi Valley Medical Society in 1891 (abstract published in the *Medical Record* and in *Sajous Annual*.) He described the breathing in a case of tobacco poisoning as irregular, consisting of several short shallow respirations, followed by one deep and gasping. He counted the respirations, and found them 20 to 22 per minute. I have to plead guilty myself to having failed to observe the kind of

* Read before the Montreal Medico-Chirurgical Society.