Recently the other two boys were admitted to the same institution, but the epileptic, on account of this defect, had to be discharged.

Prevention.

From the genealogical table it will be seen that the tendency to transmit blindness by the females shows no sign of diminishing, but rather of increasing. Through how many generations the condition may be handed on it is impossible to conjecture. Marriage and parenthood should be avoided by the members of this family, especially by the females. The male members show no tendency to transmit the disease as far as can be ascertained.

I am indebted to Dr. J. J. Butterworth, County Medical Officer of Health, Lancashire, for permission to publish this case, and to Mr. W. H. Illingworth, of Henshaw's Institution for the Blind, Old Trafford, for allowing me to make use of the report on one of the cases.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, November 9th, 1921. ² Norris and Oliver: *Sym. of Diseases of the Eye*, vol. ii, p. 441. ³ *Hygiène de l'oeil*, p. 134.

THE INTERPRETATION OF SYMPTOMS IN DISEASE OF THE CENTRAL NERVOUS SYSTEM.

ABSTRACT OF THE GOULSTONIAN LECTURES, DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS,

BY

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LECTURE II.

IN his second lecture Dr. Feiling dealt particularly with alterations in muscle tone and changes in reflexes. Alterations in muscle tone were one of the most common and most important symptoms of disease of the central nervous system; therefore the recognition and interpretation of the more characteristic of these changes was very necessary. He did not propose to discuss the exact mechanism by which these changes were produced; he restricted himself to emphasizing the clinical value of an appreciation of the different changes of tone.

Hypertonus or Increased Tone.

With regard to hypertonus, the terms "spasticity" and "rigidity" were applied more or less indiscriminately to states in which the musculature of the limbs exhibited an increased tone. The textbooks stated that it was lesions of the upper motor neuron which caused such spasticity. This was true, but was far from being the whole truth. The upper motor neuron was a very complex mechanism, by means of which many different systems of fibres acted on the lower motor neuron. It was possible to distinguish broadly between the hypertonus of pyramidal lesions—that is, lesions interrupting the cortico-spinal tract—and that of extrapyramidal lesions, not merely by any differences in the reflexes, but by the intrinsic characters of the hypertonus itself. Thus in hemiplegia due to a vascular lesion of the internal capsule or its neighbourhood, after the preliminary stage of flaccid palsy, if the limbs became spastic, the characters of this spasticity exemplified the particular changes in muscle tone which occurred in lesions of the pyramidal tracts. There was a marked difference between the arm and the leg. The leg was stiff in a position of extension, but in the arm it was the flexors which showed increased tone, the characteristic attitude of the arm being adduction at the shoulder and flexion at the elbow and wrist joints. Cases due to cortical or sub-cortical lesions did not usually show so great an increase of tone. In the arm the hypertonic muscles would yield to firm passive extension at the elbow-joint. They often gave way somewhat suddenly, so that, unless contractures had occurred, the arm could be almost fully extended. If the arm were then flexed again at the elbow, and the patient told to extend it himself, there might be extension to some point, and then the flexor muscles became tonically contracted and so prevented further extension.

But in disease of the extrapyramidal motor system the position was different. Paralysis agitans, for example, began in many cases with a hemiplegic distribution of symptoms, and might remain in this state for a considerable time, the onset of the tremor being delayed perhaps for many months.

Abdominal and plantar reflexes, especially in old people, were not always easy to elicit. The character of the hypertonus was different here from that in hemiplegia due to lesions of the pyramidal tract. Instead of finding hypertonus in the flexors of the arm and extensors of the leg, there was a diffused rigidity affecting all muscles more or less equally, and not altered by voluntary or passive movements of the limb. This was often found in cases of encephalitis lethargica, apart from the cases which exhibited the Parkinsonian syndrome.

Wilson, in his original description of progressive lenticular degeneration in 1912, clearly distinguished between the universal diffused stiffness of muscles in that condition and that found in the ordinary cases of hemiplegia. In spastic paraplegia due to disease of the spinal cord a careful study of the nature and distribution of the rigidity present could give a valuable insight into the degree of damage to the cord. These differences in the character of the hypertonus has been emphasized by the study of cases of gunshot injuries during the war, and notably by the work of Head and others. Lesions of the cord which, on the motor side, interfered with the function of the pyramidal tracts only, would cause paraplegia in extension. More severe lesions produced paraplegia in flexion. In some cases this study might also help in localizing the anatomical site of the lesion, and aid in determining the nature of the pathological process, for the more peripherally placed lesions would involve more the pyramidal tracts, with the production of paraplegia in extension; and the more centrally placed lesions would tend to involve other tracts as well, with the production of paraplegia in flexion. This was of real value in the matter of prognosis.

Decerebrate Rigidity.

Dealing next with decerebrate rigidity, the lecturer said that numerous observers had recently claimed to have found in certain disorders of the central nervous system a clinical picture under this name. Wilson had reported cases in which, with impairment of consciousness, there was tonic rigidity of trunk and limbs, with exacerbations in the form of tonic or postural fits. The typical posture was with arms rigid, adducted at the shoulder, strongly extended at the elbow, with internal rotation and marked pronation of the wrists. In Wilson's cases the pathological conditions found were very various, including cerebral tumour, cerebral haemorrhage, and tuberculous meningitis. Recent papers, however, did not fully agree with Wilson's views, and it was pointed out that only in the matter of posture did the picture resemble that of decerebrate rigidity, and that there was lacking the other characteristics, particularly those described by Sherrington. As to whether conclusions of clinical value could be drawn from these cases, the lecturer said that this phenomenon represented disturbance of function only; it did not necessarily indicate permanent structural disease. He quoted cases in which, although the posture was almost exactly similar, the pathological cause varied greatly. One was that of a child aged 2½ years, who was admitted on account of optic neuritis, and during the two months of his illness lay unconscious, flat on his back, with the extensor muscles of the neck and trunk stiff, the eyes being in a position of spasmodic convergence. There was the typical meningeal cry. The positions of the limbs were those already described. After death there was found an infiltrating tumour of the brain, of sarcomatous type, occupying the whole mid-brain, and extending into the crura on each side. The picture, indeed, gave no indication of the pathological process at work; it was merely a sign of disordered function: a lesion had upset the normal balance between the many different systems of fibres which acted on the motor neuron, allowing some particular system to exert an abnormal effect.

Ramsey Hunt had recently elaborated a theory of the dual nature of the motor system. This supposed the existence of two systems: (1) kinetic, (2) static—the first associated with movement, the second with the maintenance of posture. Movements and postures were regarded by Hunt as of three varieties—reflex, automatic associating, and isolated synergic. Also he postulated three divisions of the nervous system: segmental, paleo-encephalon, and neo-encephalon, each of these containing the two different motor systems—that is, kinetic and static. There was not yet available sufficient accurate knowledge of the functions of the extrapyramidal system alone to warrant the acceptance of this hypothesis in its entirety.

Hypotonia was present in some cases, such as severe instances of acute anterior poliomyelitis. Lesser degrees of

it were often overlooked, yet it was an important guide both as to regional diagnosis and concerning the patient's disability. Lesions of the spinal nerve roots might be responsible for hypotonia. Opinion now in the main inclined to the belief that hypotonia was one of the leading symptoms in disease of the cerebellum or of its efferent nerve tracts; and Gordon Holmes had shown that it was in acute or recent lesions especially that hypotonia was most characteristically found.

Reflexes and Their Limitations.

In the past the study of reflexes and their limitations had tended to dominate the investigation of nervous disease to the neglect of other symptoms, largely because of the greater ease with which disturbances of this kind could be examined as compared with the time and trouble required to investigate alterations in sensation, motion, and changes of tone. Perfunctory testing of reflexes had been too often considered a sufficient examination of a case, and especially in the presence of gross exaggeration was supposed to be diagnostic of organic as against functional disease. This partial truth had led to much confusion and difficulty. The reflexes were of three kinds: (1) Superficial or cutaneous; (2) deep or tendon; (3) organic or motor. As to the oculo-cardiac reflex—pressing firmly on the eyeballs and noting the amount of the slowing of the pulse which occurred, or its absence—Dr. Feiling had not found it to possess any clinical value. The Achilles jerk was best tested with the patient kneeling, and he regarded it as of equal value to the knee-jerk, especially in cases in which the lower parts of the spinal cord or the chorda equina might be involved. In eliciting the cutaneous reflexes the skin should be warm. Abdominal reflexes were apt to be feeble in people with a pendulous abdomen. With regard to reflexes in general a difference on the two sides was much more important than any quantitative symmetrical alteration.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

HAEMORRHAGIC COLITIS.

THE interesting communications on haemorrhagic colitis by Mr. Geary Grant (February 25th) and Mr. Lockhart-Mummery (March 11th) encourage me to report the successful treatment of a severe case under my care in 1909. It is the only case of this nature which I have had to treat, and it gave occasion for the one and only operation for appendicostomy that I have performed; for this reason perhaps I have a very vivid recollection of the circumstances. The successful result I attribute to the rationale of one of the methods of lavage adopted after the operation, which I believe had not been entertained previously as a weapon in combating the infection of the colon.

In December, 1908, I was asked by a fellow practitioner to see a man, aged 25, who had been suffering since the previous September from frequent diarrhoea. Early in November he had to take to bed, and the motions, eight to twelve a day, were accompanied by much blood and mucus. There was no evidence of tubercle; he was "running a temperature," was extremely emaciated and anaemic and feeble; had lost nearly 3 st. in weight from his normal 9 st.; pulse frequent, great thirst, tongue dry and raw, face drawn and anxious. There were several badly decayed teeth, and the breath was foul. He appeared to be in the later stages of exhaustion, and though recovery seemed doubtful I advised that he should be removed to hospital and have appendicostomy performed, with subsequent lavage of the colon, on the lines suggested by the late Mr. Keetley, who, I believe, was one of the first to advocate this operation in colitis. Early in January, 1909, he was taken to the cottage hospital, and there I fixed the appendix to the abdominal wall, opening it up a few days later. His condition at this time was very bad, accentuated doubtless by the operation and anaesthetic. There was constant passage of blood and mucus, extreme exhaustion, and vomiting had commenced. After opening the appendix a variety of injections was tried. I can remember saline, hazeline, Condy's fluid, protargol; from a pint to a quart of these was given twice or three times daily, and each in turn for five or six days. China clay emulsion had not then come into vogue.

I can recollect some slight improvement with the Condy's fluid, but at the end of January his condition had become desperate; he was quite apathetic, was turning his face to the wall, and the stools, though less offensive, were frequent, and contained much blood and mucus. It was evident that merely washing out the bowel with large quantities of such mild antiseptics as could be borne was not adequate to stop the infection, and it occurred to me that it might be possible to combat it in another way—namely,

by keeping the bowel charged with a dominant and antagonistic micro-organism such as the lactic acid bacillus, growing in an acid medium, with the hope that it might crowd out or displace the *coli* group and its auxiliaries, which flourish under the normal (alkaline) conditions of the colon. Sour milk prepared by inoculation with a liquid culture of *B. bulgaricus*, and incubation for forty-eight or more hours, was employed, and a quart of this was used for irrigation of the bowel through the appendix opening twice or three times daily. Within a few days distinct improvement was noticed: the stools were acid, with less blood, and much less offensive, and the tendency to vomiting ceased. The sour milk irrigations were kept up for about a month, being gradually diminished in frequency and amount; blood gradually disappeared, and the patient's general condition improved in every way. He left hospital in May, 1909, convalescent, weighing 7 st., and resumed his work as a clerk in September, 1909, weighing 9 st.

In view of the possibility of recurrence the appendix was kept open until October, 1911, when it was closed by Mr. Bailey, F.R.C.S., in St. Bartholomew's Hospital.

I have recently seen this patient after many years; he is in perfect health, was placed in Class B for war service, is now married and the father of a healthy child. There is a slight bulge at the site of the appendix opening; otherwise the scar is narrow and firm.

There is nothing, of course, new in the idea of using an innocuous organism or its products to antagonize the pathogenic effects of a harmful one, but the striking results in this case were so obvious that it is perhaps worthy of record, and I should be interested to hear if this method, or one based on similar reasoning, has been employed by others.

Wimbledon.

JOHN A. HAYWARD.

MR. LOCKHART-MUMMERY'S remarks (March 11th, p. 412) on the comparative rarity of this disease, and the value of appendicostomy in it, tempt me to write a brief account of two similar cases, the only ones I have seen in twenty years; in neither was a sigmoidoscopic examination made, so I am unable to say if the condition of the colon was the same as Mr. Geary Grant described, or was one of ulcerative colitis with an open vessel in the base of an ulcer, but I imagine this is not of great moment from the point of view of treatment.

CASE I.

A young woman, aged 23, was sent into hospital as a case of colitis with severe haemorrhage, which had been going on for a fortnight. She passed daily 3 or 4 oz. of blood, which was judged to come from about the sigmoid flexure.

She was treated medically, and was given on alternative days large wash-out saline enemata followed by an enema of a pint of solution of protargol; all this was done in the knee-elbow position. For a time it had no effect in checking the bleeding, and my anxiety was becoming acute because she was getting blanched; but happily she then began to lose less and at the end of six weeks the bleeding ceased.

She was kept in bed for a further six weeks, with no signs of a recurrence, but on her first day out of bed the bleeding started again and was nearly as bad as before.

Treatment on the same lines was again begun, and the result was rather more rapid than before, but after four months in bed the bleeding began again as soon as she walked about. The medicinal treatment and the enemata were on both occasions continued for some time after the bleeding ceased.

She had come into hospital on October 8th, 1913, and we were now in the middle of April, 1914, and she was no better. I did appendicostomy, and in a week or two the bleeding ceased and did not return. The rapidity of cure, and the ease and efficiency with which the large bowel was washed out, formed a marked contrast with the methods and results achieved before the operation. She left hospital in due time, and came to me again four years later for the cure of a hernia which had occurred through the abdominal wall by the side of the appendix. She had no return of colitis.

CASE II.

The second case, a girl aged 11, admitted in 1915, was similar in all particulars, save that after a period of observation I straightway did appendicostomy with most satisfactory results.

While on the subject of appendicostomy I may mention that in two cases of perforated gastric ulcer with great soiling of the peritoneum, instead of draining Douglas's pouch by a tube through an incision above the pubes, I have done appendicostomy, drained through this wound, and immediately opened the appendix; through this I was able to run in saline, aperients, and peptonized food (the latter half a pint or more at a time) as the occasion demanded. It appears to me that it is an immense advantage to be able to do this in a patient who is always suffering from shock, general peritonitis, and almost certainly post-anaesthetic vomiting, and, moreover, has a recently stitched up hole in his stomach.

Sherborne, Dorset.

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