

Periscope.

BRAIN

(Vol. 26, 1903, No. 102, Summer.)

1. The Nature of Inhibitory Processes within the Nervous System. W. McDougall.
2. On "Stringhalt" and "Shivering" in Horses. A Study in Comparative Neuro-Pathology. CHALMERS WATSON.
3. A Case of Erb's Juvenile Dystrophy Associated with Bilateral Enlargement of the Parotid and Submaxillary Glands. J. MITCHELL CLARKE.
4. Notes on Toxic Degeneration of the Lower Neurones Simulating Peripheral Neuritis. R. T. WILLIAMSON.
5. Chorea and Graves' Disease. G. A. SUTHERLAND.
6. The Functions of the Frontal Lobes. JOSEPH SHAW BOLTON.
7. Clinical Studies. PROF. A. PICK.

1. *Inhibitory Processes within the Nervous System.*—This paper consists of three parts: (1) a brief critical review of the present state of opinion as to the status of inhibitory processes; (2) some considerations that suggest a certain hypothesis as to the nature of such processes in the central nervous system; and (3) the description of some experiments that seem to support that hypothesis. Under the first section the author discusses the theories of Hering and Verworn, those of Wundt and Gaskell, and some of the later theories of Mercier and Münsterberg; none of these theories are satisfactory to the author. He settles down to the conviction that there are but two serious theories that are worthy of consideration: (1) inhibition may consist in the direct checking of katabolism; and (2) inhibition may consist in the cutting off of nervous influences that cause increased katabolism. As to which view the author would have us believe is not made clear. Inhibition, however, in the greater part of the nervous system, he says, in all that part concerned in the control of the skeletal musculature, consists simply in the cutting off from the tract inhibited of the excitatory impulses by which alone its activity can be maintained. When a hypothesis is sought as to the mechanism by which this cutting off of the excitatory influences may be effected, clear and unmistakable indications are afforded by certain psychological considerations. Thus inhibition is made largely a matter of mental processes, and inhibition of the excitation of one neural system is always the result of the excitement of some other system. Thus inhibition appears always as the negative or complementary result of a process of increased excitation in some other part. As to the mechanism, suggestion is but a vague guess. Such is the view the author takes of the process of inhibition in the higher brain levels. As far as inhibition in the spinal cord is concerned, the author assumes that (1) Inhibition in one part always appears as the negative aspect of an excitation in another. (2) The fact that a stimulus to a given spot of skin may cause a reflex contraction of the flexors or extensors according as the extensors or flexors have been in tonic reflex contraction for some time before the application of the stimulus. (3) A very perplexing feature of reciprocal inhibition, the fact, namely, that in the spinal animal, inhibition due to excitation of a nerve path or center is unusually quite transient, and passes over into exaltation even during the continuance of the stimulation if that be fairly prolonged; and that the reflex spinal movement, if

prolonged, tends always, in the author's experience, to be of *alternating* character. The author further gives some experimental data tending to maintain the truths of his thesis.

2. *"Stringhalt" and "Shivering" in Horses.*—An interesting series of observations from which the student of human pathology can learn somewhat concerning the relationship of vascular disease to nerve degeneration.

3. *Erb's Juvenile Dystrophy.*—In the case reported there was a remarkable association of general and pronounced muscular atrophy with enlargement of the parotid and, to a less degree, of the submaxillary gland. The development of both atrophy and swelling was synchronous, although the atrophy has recently progressed and the swelling remained stationary. Beyond the coincidental occurrence of the two conditions, nothing new is presented.

4. *Toxic Degeneration of the Lower Neurones.*—Dr. Williamson gives the history of an interesting case of paralysis of the small muscles of the hand and of the extensors of the fingers and wrist with paresis of the flexors. The paralysis followed an acute illness, the chief symptoms of which were pain in the limbs and trunk, which might have been due to influenza. Arsenic, alcohol, lead and diphtheria could be excluded. The chief interest in the paper was the uncertainty of diagnosis, resting, as it did, between an attack of acute anterior poliomyelitis and peripheral neuritis similar to a clinical group of cases originally outlined by Dr. Stanley Barnes.

5. *Chorea and Graves' Disease.*—Sutherland discusses the nature of the association between chorea and Graves' disease, reporting in detail the histories of two patients, both of which show that Graves' disease may follow chorea, a condition which certain clinicians have denied. The author further brings out some interesting and striking similarities between these two affections and partly suggests that, whereas the nervous symptoms present in these two diseases may not have the same cause, it may be possible that they depend on similar affections of the central nervous system; and further that it may be that in children this affection produces the symptoms known as chorea, while in early adult life it is manifested by the symptoms known as Graves' disease.

6. *Functions of the Frontal Lobes.*—The author's paper deals with the subject of the functions of the frontal lobes from the standpoint of morbid anatomy of mental disease and the general histology of the cerebral cortex in normal individuals and in the subjects of mental disease. The anterior portions of the frontal lobes are particularly dwelt upon in this paper. The author first sums up the work of preceding investigators, and then presents a summary of some of the work recently done in the London County Asylums. He says that it has been demonstrated that the amount of cerebral wasting and the associated morbid changes inside the cranium in two hundred cases of mental disease vary directly with the amount of dementia existing in the patients. The relationship is remarkably exact and the regions of relative wasting can be determined with considerable accuracy. Taken generally, for individual variations exist, the regions of wasting, from observations of several hundred cases, are as follows: (1) The greatest amount occurs in the prefrontal region (anterior two-thirds or so of the first and second frontal convolutions, including the neighboring mesial surface, and the anterior third or so of the third frontal convolution). (2) The wasting is next most marked in the remainder of the first and second frontal convolutions. (In dementia paralytica Broca's convolution should, as a rule, be included here and (2) and (3) should follow (4)). (4) It is next most marked in the first temporal convolution and the insula, and in the superior and inferior parietal lobules. In practically all cases it is more marked in the two former than in the two latter. (5) It is least marked in the remainder of the cerebrum (including the orbital surface of the frontal lobes), particularly in the inferio-internal as-

pect of the temporo-sphenoidal lobe and the posterior pole of the hemisphere. With reference to the general histology of the cortex the author presents a brief summary of the development of the different layers, and then shows what variations from the normal are to be expected in cases of mental disease. He considers it proved that the great anterior center of association, lying in the prefrontal region, is undeveloped on the one hand, in all grades of primary mental deficiency; and on the other undergoes primary atrophy pari passu with the development of dementia; *it is therefore the region of the cerebrum which is concerned with the performance of the highest coordinating and associational processes of mind.*

7. *Clinical Studies.*—Prof. Pick, of Prague, here presents a few clinical studies which are of interest. Dreamy mental states as a permanent condition in epileptic pathology, Protraction of Impression as a cause of disturbance of sensory perception; and Reduplicative Paramnesia are the titles of his studies. JELLIFFE.

(Vol. 26, 1903, No. 103, Autumn.)

1. Hughlings Jackson as Pioneer in Nervous Physiology and Pathology. SIR WILLIAM BROADBENT.
2. Tetanus Dolorosus, and the Relation of Tetanus Toxin to the Sensory Nerves and the Spinal Ganglia. W. M. FLETCHER.
3. Notes on the Minute Structure of the Human Caudate Nucleus and Optic Thalamus. JOHN TURNER.
4. Hereditary Spastic Paraplegia. Its Relation to Friedreich's Disease and Its Claim to be Considered as a Clinical Entity. H. CAMPBELL THOMPSON.
5. A Report of Two Cases of Paraplegia Occurring in Variola, One being a Case of Anterior Poliomyelitis in an Adult. WILLIAM G. SPILLER.
6. The Evolution of Consciousness. W. H. B. STODDART.
7. Lesion of the Brachium Pontis with Division of the Trigeminal and Facial Nerves. WM. CHARLES WHITE.
8. Cerebral Embolus During an Epileptic Fit. WALTER BROADBENT.

1. *Hughlings Jackson.*—Sir William Broadbent here delivers the Hughlings Jackson lecture, in which he traces the development of Hughlings Jackson's ideas. It is a very full summary of this well-known investigator's views, and shows very conclusively how large moulded a man he is. A full bibliography of Jackson's contributions to neurological science is appended, 197 titles being given. "The Study of Diseases of the Nervous System" is added to this paper. This is a reprint of a lecture delivered by J. Hughlings Jackson at the London Hospital in June, 1864. It is largely of historical interest.

2. *Tetanus Dolorosus.*—An experimental paper concerning itself largely with the methods of conveyance of tetanus toxin in the nerve trunks and their lymphatics.

3. *Minute Structure of Caudate Nucleus and Optic Thalamus.*—Turner continues his histological researches, and presents a series of pictures of the nerve cells in these two regions as studied by both the Golgi method and the methylene blue and a hydrogen peroxide method. The author says that there is a very striking resemblance between the structure of the caudate nucleus and some parts of the frontal cortex; in both cases there are similar dark cells, but those of the frontal region give off finer dendrites whose lateral appendices are more delicate. This similarity in cells might be inferred to be so since the development of the central nervous system shows that the cortex and caudate nucleus have a similar origin. With reference to the structure of the cells of the optic thalamus Turner says that many of them are quite similar to those of the caudate nucleus;

but one thing is prominent in most of the thalamic sections: that is a wealth of big spider cells which send out numerous, short, rather wavy, not very sharply defined branches. Further are technical details too minute for general consideration.

4. *Hereditary Spastic Paraplegia*.—The relation of this disease to Friedreich's ataxia is discussed. In his summary the author concludes that in hereditary spastic paraplegia a disease is present which clinically shows itself by a premature degeneration of the lateral tracts with the posterior. Possibly other columns occasionally participate to some extent. It has a tendency to run in families and apparently, though to a less extent, to be actually hereditary; isolated cases are also frequently met with. There is a very close relationship between it and Friedreich's disease, but it is distinguished from the latter by the predominance of the spastic symptoms, although here and there, as might be expected, the two practically merge into one another.

5. *Two Cases of Paraplegia in Variola*.—Dr. Spiller reports these cases, in one of which, a woman, the paralysis occurred during the third week; in the second patient the paralysis occurred eight days after the onset of the disease. Schamberg, from whom the patient was referred, states that in 2,800 cases of variola observed in the Municipal Hospital during the past two years, there were seven instances of paralysis; three of the patients recovered, while four died. In the cases under discussion Dr. Spiller reports that nothing distinctly abnormal could be detected in the spinal chord of the first case. In the second case, however, the gray matter was chiefly affected, and in the lumbar portion of the spinal cord the white matter was scarcely implicated at all. In the lower cervical region a small area in one anterior horn of one of the sections could be found staining a very light color by Weigert's hematoxylin method, showing that the medullary sheaths of the nerve fibers within this area had disappeared. The white matter was only slightly implicated! Some black spots were found by the Marchi method scattered over the transverse sections, indicating diffuse degeneration from lesions lower in the cord. About the mid-thoracic region the gray matter of the anterior horns was chiefly affected, and portions of it stained very faintly by the Weigert hematoxylin method, but in this region the white matter was considerably implicated. In the lumbar region the light color of the anterior horns by the Weigert hematoxylin method was in striking contrast to the deep staining of the posterior horns. The white matter was only slightly affected. Masses of fatty granular cells were found in the faintly staining areas, and perivascular cellular infiltration also was present. The blood-vessels of the anterior horns were congested. The anterior and posterior spinal roots stained well. The nerve cells of the anterior horns in the cervical and lumbar regions presented more or less chromatolysis, displacement of the nuclei, and loss of dendritic processes, but the alteration of the nerve cells was not intense. The degenerative changes of the anterior horns throughout the cord, causing faintly staining areas by the Weigert hematoxylin method were remarkable, and justify the classification of this second case under the head of anterior poliomyelitis. The contrast between the light anterior horns and the dark posterior horns in stained sections was so intense that it was perceptible to the naked eye in the lumbar region. Strictly speaking, the case was one of diffuse myelitis, but, with the exception of a part of the thoracic cord, the myelitis was almost confined to the anterior horns, and was an anterior poliomyelitis, and probably of vascular origin.

6. *Evolution of Consciousness*.—The author presents an interesting summary, with diagram, of present ideas concerning the development of the conscious processes. The paper is condensed and should be consulted in the original.

7. *Lesion of the Brachium Pontis.*—The author here gives the history of an accidental bullet wound which entered the chin and lodged at the right side of the foramen magnum. In four or five days there was paralysis of the right side of the body, face, arm and leg, loss of the faculty of speech and slight loss of hearing on the right side. The patient's right eye was turned up to the left, but he still retained vision on this side. Swallowing was performed with difficulty, and the sense of taste was disturbed from the start. This occurred in 1899; in 1902 the patient was seen by the author, and a summary of his condition is given. (1) A complete lesion of the trigeminal nerve on the right side, from its very completeness evidently between the semilunar ganglion and the entrance of the root into the pons varolii, *i.e.*, during its course inwards along the middle cerebellar peduncle; (2) a complete lesion of the facial nerve, distal to its cells of origin in the medulla—a lower motor neurone lesion, from its completeness and the subsequent atrophy of the muscles; (3) possibly a lesion of the eighth nerve. Dr. L. F. Page examined the ear and reported it normal; and yet there was some deafness at first, which gradually increased until at present air conduction is entirely destroyed. If any portion of the auditory nerve was injured it must have been the anterior and mesial or vestibular branch, but as this has nothing to do with the sense of sound, one must look for some deeper lesion in explanation of the absent function of air conduction on the right side. This would be possible in a lesion of the superior olive, the lateral lemniscus, or the trapezoid body. Only the first of these would conform in position to the course of the bullet, taking its entrance to the pons and its present position as shown by X-ray picture as the points through which to draw a little to indicate its line of travel. The lateral lemniscus would then lie too far cerebral-wards, and the trapezoid body too near the median line to be affected. According to Babinski, if the cochlea be destroyed in a newborn animal there result atrophy and disappearance of the cells and white matter of the nucleus olivaris superior of the same side; and von Bechterew has described a connection between the superior olivary nucleus and the nucleus of the sixth nerve. This latter connection might possibly explain the muscular derangement of the eyeball in the present case in which the ball was turned upwards and inwards. The only place where such a complete lesion of these two nerves could occur with the present source of injury, *i.e.*, a revolver bullet approximately three-eighths of an inch in diameter, must be at a point where they come nearly enough together to be severed by the bullet in its passage. Only one such place exists, and that is over the brachium pontis, as it sinks into the cerebellar substance. One must remember here that the lesion was practically confined to the fifth and seventh nerves. The fifth nerve as it passes inwards and backwards from the Gasserian ganglion to enter the pons lies closely enough to the seventh nerve, as it passes upwards and outwards to enter the internal meatus, to be divided by such a missile. The possibility of fractured bone causing part of the injury is negated by the confinement of the lesion remaining.

8. *Cerebral Embolus During an Epileptic Fit.*—Dr. Walter Broadbent reports a case of a woman, aged 44, who had been subject to epileptic fits for seven years. Two days before the present illness she had had five fits. The present fit was different from the usual ones in that there was irregular jerking of the right arm and leg and the mouth was drawn over to the right. She remained unconscious for five hours and died on the ninth day. *Post mortem.*—Small embolus was found in the right middle cerebral artery just beyond the point of origin. The cortex along the course of the vessel was softened, and on section the right corpus striatum and all the surrounding parts, including the portion of the frontal lobe, were in a state of extreme softening.

JELLIFFE.