of constant muscular tension which underlies and makes possible all orderly motion.

1. The question of sympathetic innervation. Though the subject is far from settled, the author states we are justified in concluding, in the words of Langley, that "there is a balance of histological evidence that sympathetic nerve-fibres form hypolemmal endings on some striated muscle fibres."

2. Innervation of red and white muscle fibres. It appears that in mammals red and white muscles differ somewhat both in anatomy and physiology, but the distribution is variable and white fibres may perhaps turn red. The type of innervation gives no clear and consistent anatomical basis for distinguishing between red and white fibres. There appears to be, however, a clearer distinction in reptiles.

3. Contractility of sarcoplasm. The author cannot find that there has ever been any proof that the sarcoplasm in a muscle fibre is in fact contractile. It is purely a hypothesis.

4. Sympathetic influence on muscle tone. After a long examination of the data advanced by Hunter, Langelaan, and many more, the author summarizes as follows: "until it can be proved (a) that mammalian muscle contains two distinct forms of fibre, the slender and the coarse, each with a special innervation, and until (b) there is satisfactory proof of the existence of two kinds of muscle tone, plastic and contractile—the theory of Hunter cannot be accepted. Additional evidence is also desirable to explain the 'interval' after operation. Nor will the evidence ever be satisfactory until some positive proof is obtained through stimulation experiments."

5. Creatin metabolism. No satisfactory evidence has been produced that creatin metabolism is in any special way associated with tonic muscular contraction.

6. The tonus of skeletal muscle as a proprioceptive reflex. Static and kinetic movements can be explained on the basis of one neuromuscular mechanism. 'Tonic' and 'phasic' reflexes, though unlike, are separated by no fundamental difference in physiological mechanism. Tonus is a graded series of proprioceptive reflexes, continuously and unconsciously playing its part in every motor act. By its remarkable specificity it moulds individual muscles; by its universality it controls postures.

S. A. K. W.

NEUROPATHOLOGY.

[140] A contribution to the pathology of paralysis agitans.—C. M. BYRNES. Arch. of Neurol. and Psychiat., 1926, xv, 407.

This paper is devoted to a study of the muscular tissue and its proprioceptive system of nerve terminals in paralysis agitans, and is well illustrated by numerous drawings and microphotographs, some of which are in colour. Byrnes considers that there is much in the clinical course of paralysis agitans.
to suggest that in some instances, at least, it may be dependent on a morbid process situated in the peripheral mechanism concerned in the production and maintenance of muscle tone, and accordingly he made an examination of the muscular tissue obtained by biopsy from fourteen cases of genuine paralysis agitans. No evidence could be obtained that the disease is of myopathic origin, but a constant lesion in the neuromuscular bundle was discovered, characterised by oedema, early degeneration of the intrafusal nerve, and final disintegration of the entire spindle. The intramuscular nerve trunks were normal, and the surrounding musculature was, as a rule, unaltered. Although studied in a variety of other diseases, no lesion of the neuromuscular bundle similar to that observed in paralysis agitans was discovered, and eight muscle spindles from a case of postencephalitic Parkinsonian syndrome of five years duration appeared perfectly normal. It is therefore legitimate to assume that the lesion of the spindle in cases of paralysis agitans is primary, and not secondary to the tremor or the rigidity. It appears to be a toxic parenchymatous degeneration of the intrafusal nerve terminals, and it is conceivable that one or more toxic substances of metabolic or glandular origin might exhibit a selective affinity for the neuromuscular bundle. In view of the fact that paralysis agitans is not accompanied by any appreciable abnormality in the perception of muscle sense, Byrnes concludes that the spindle does not subserve this function. It does, however, play an essential part in the mechanism of muscle tone, and it is the author's belief that the spindle is the afferent inhibitor of the striothalamic tonic centres. Hypertonia of the Parkinsonian type might originate, therefore, from either central or peripheral disease of this system of fibres: and it is suggested that the central lesion finds its chief exponent in the postencephalitic syndrome, while genuine paralysis agitans in its typical form is characteristic of the peripheral lesion. This assumption does not preclude, however, the possibility of a combination of the two lesions in certain types of Parkinson's disease in which the symptoms are widespread and fully developed in the early course of the disorder.

R. M. S.

[141] The spinal fluid sugar in cases of epidemic encephalitis and other nervous disease (Recherches sur la glycorachie dans les cas d'encéphalite épidémique et d'autres affections du système nerveux central).—C. J. MUNCH-PETERSEN and KNUD WINTHER. Acta Psychiat. et Neurolog., 1926, i, 188.

Using the method of Hagedom-Norman-Jensen, the authors have investigated the sugar content of the cerebrospinal fluid in various neurological disorders. They found a variable degree of sugar increase in the acute (rarely the chronic) stage of encephalitis: sometimes there was a corresponding increase in the blood sugar level. This hyperglycorachis is not diagnostic of encephalitis, being found in many other pathological states (diabetes, malaria,
certain fevers and intoxications, cerebral and spinal tumours, epilepsy, paralysis agitans, cerebral softening). According to the literature an increased sugar value has also been noted in acute poliomyelitis, dementia praecox, general paralysis and syphilitic meningitis.

The authors believe, however, that an estimation of the spinal fluid sugar may be of value in differentiating epilepsy from hysteria, and meningitis from meningismus. In meningitis, examination of the spinal fluid sugar from day to day may be a prognostic aid, a return from a low figure to normal being a good omen.

M. C.


The basal metabolic rate was determined in 47 cases of postencephalitic syndrome. Of these 53 per cent. gave a plus reaction, seven per cent. a minus reaction, while 40 per cent. were within normal limits. At the same time other vegetative disorders such as obesity, polyuria, etc., were noticed. The explanation given is that there is a complex system of vegetative centres controlling both sympathetic and parasympathetic activities in the midbrain and basal ganglia, and that varying lesions destroying or obstructing, now one path or centre and now another, account for the variations in the symptoms.

R. G. G.

SENSORIMOTOR NEUROLOGY.


The author reviews the literature dealing with the symptomatology of frontal lobe tumours and describes two fresh cases, one a case of glioma of the right frontal lobe, with a smaller tumour of the left temporal pole; the other a case of hydatid cysts in the left frontal and the parietal lobes. Of the many symptoms considered to be to some extent diagnostic of tumours of the lobe the author lays special stress on deviation of the head and eyes to the side opposite to that of the tumour, or paralysis of conjugate deviation of the eyes to this side. Of the psychic changes the most striking is "hyperexcitation of the imagination," which over-rides other faculties such as memory and attention and often leads to an irrepressible optimism. One proof of this hyperexcitation is an exaggerated response to pinprick, only present when the patient watches the pin. It often leads to alterations of conduct, such as