Abstracts.

Neurology.

NEURO-ANATOMY AND NEUROPHYSIOLOGY.

[174] **On neurobiotaxis.**—C. U. ARIEN KAPPERS. *Acta Psychiat. et Neurol.*, 1927, ii, 118.

THIS paper is a report of a lecture given before the Neurological Society of Kopenhagen. It outlines the main features of the author's well known law of neurobiotaxis, formulated in 1907 and made familiar to English readers through recent publications (*Brain*, 1921). Neurobiotaxis is an extension of the law of mental association applied to the anatomy of the central nervous system. In general terms it means that structures of the nervous system are arranged according to the impulses which pass through them: furthermore, that structural propinquity results from simultaneous activity of discrete functions. The general principle is supported by numerous illustrations, which suggest that the "teleogic character of the intrinsic structure of the brain coincides with neurobiotactic causality."

M. C.

[175] **The relation of the cerebellum weight to the total brain weight in human races and in some animals.**—C. U. A. KAPPERS. *Jour. Nerv. Ment. Dis.*, 1927, lxv, 113.

THE literature is reviewed and the author's own observations on animals of various species and orders are discussed. From these it appears that the size of the cerebellum, especially of the hemispheres, depends on the use of the limbs, the largest hemispheres being found in those animals which require most careful and exact inhibition of the antagonists during the activity of the agonists.

R. G. G.

[176] **The columnar arrangement of the primary afferent centres in the brain-stem of man.**—W. FREEMAN. *Jour. Nerv. Ment. Dis.*, 1927, lxv, 1.

CONSIDERING the brainstem in the same way as is commonly employed in the investigation and description of the spinal cord, the author lays it down that the fifth, seventh, ninth and tenth cranial nerves are similar in construction to the spinal nerves; each innervates a certain cutaneous area with general exteroceptive cutaneous sensation, and a certain area of mucous membrane with general interoceptive sensation. Each supplies motor fibres to muscles originating from the visceral motor system which once surrounded the alimentary

canal. Each carries proprioceptive fibres from the muscles of its area of supply and segmental reflex fibres. The course of these fibres is traced, and when the location of columns is compared at various levels it is seen that a constant relationship is maintained, practically identical with that observed in the spinal cord. The findings in the spinal cord can be applied directly to the brain-stem, making allowance for the overgrowth of certain components of some nerves and others of other nerves. Many of the structures cease to have an obscure and unusual significance and when disguise is stripped off become much more like the same structures in the spinal cord with whose appearance we are familiar.

R. G. G.

[177] **The role of the dorsal roots in muscle tonus.**—S. W. RANSON. *Arch. of Neurol. and Psychiat.*, 1928, xix, 201.

RANSON considers that in spite of all the work which has been done to determine its nature and cause, muscle tonus still presents an unsolved problem. Any theory to explain it cannot be considered satisfactory unless it provides a mechanism for maintaining posture without fatigue and with a minimum expenditure of energy, by a type of contraction which is more or less free from action currents. Two theories have been advanced in explanation of the part played by the dorsal roots. Of these, the proprioceptive reflex theory of Sherrington is the one generally accepted: but the theory of the antidromic conduction of tonic impulses in the dorsal root, advanced by Trzecieski and Frank, has much in its favour and must be given careful consideration. The author's experiments show that contracture, a permanent shortening of the extensor muscles which persists after section of the motor nerves or after the death of the animal, not infrequently develops in muscles deafferented by section of the dorsal roots proximal to the spinal ganglia.

Decerebrate rigidity disappears in a leg immediately after section of its sensory fibres in the dorsal roots. This is to be attributed in part to shock. If, after section of the dorsal roots, an animal has been allowed to recover and all resistance to passive flexion has disappeared before decerebration, decerebrate rigidity is slow in developing in the deafferented limb. But after the lapse of time, varying from thirty minutes to several hours, a tremulous oscillating type of rigidity develops, owing to rapidly succeeding contractions of the extensor muscles. Tonic neck and labyrinthine reflexes occur in the deafferented limb and are usually brisker and more extensive than on the normal side.

While section of the dorsal roots does not prevent the development of decerebrate rigidity, it deprives it of one of its chief characteristics, namely, plasticity. This plasticity, which is responsible for uniform stiffness and which causes a limb to hold a posture passively imposed on it, is dependent on integrity of the dorsal roots. According to the theory of muscle tonus that one holds, one can explain this plasticity as a steady contraction called forth

by afferent impulses from the tonic muscles themselves, or as due to special tonic impulses from these, or as due to special tonic impulses travelling antidromically over the dorsal roots.

R. M. S.

[178] **Reflexes in apes.**—G. D. ARONOVITCH. *Jour. Nerv. Ment. Dis.*, 1927, lxv, 457.

THE author investigated the presence or absence in apes of the reflexes which are familiar in man. These were found to be well established except in the case of the abdominal reflexes, which were not found. The explanation is that that reflex is associated with the erect attitude, since the unsupported abdominal muscles require a much more active tone than is the case in animals which are only semi-erect.

R. G. G.

[179] **Studies on the cerebral pulse** (Études sur le pouls cérébral).—J. TINEL. *L'Encéphale*, 1927, xxii, 229.

TINEL has studied the cerebral pulse in patients who had had craniotomies performed for various causes. After investigating the various fallacies attendant on this somewhat indirect method of study, he noted the effect of various psychical and physical changes and of some drugs. Slight emotional stimuli, pain and attention produced varying results, but on the whole slight stimuli produced vasodilatation, more severe and prolonged stimuli vasoconstriction and very violent stimuli almost always vasodilatation. Stimulation of the solar plexus produced vasoconstriction, while the oculocardiac reflex caused vasodilatation. Among pharmacological agents adrenalin very markedly, and strychnine and caffein to a less degree, increased the abruptness with which vasoconstriction and vasodilatation took place, whereas tartrate of ergotamine damped down these changes or made them disappear completely. Amyl nitrite and formalin caused vasodilatation. Inhalation of oxygen caused a remarkable degree of vasoconstriction, and the same effect could be obtained by hyperpnœa. That the latter was due to excess of oxygen was proved by its absence when forced breathing was performed in an atmosphere overcharged with CO_2, as by re-breathing in and out of a bag. The author draws three conclusions from his experiments :—

(1) The cerebral circulation is under nervous control, although it is not directly affected by adrenalin.

(2) Vasoconstriction and vasodilatation have not any direct or necessary relationship to mental activity or psychic state.

(3) In patients suffering from postencephalitic crises these can be brought on at will by any agency causing vasoconstriction and dissipated by agencies causing vasodilatation.

The author discusses the possibility that other, so-called hysterical, states may be due to angiospasm of the cerebral vessels.

J. G. GREENFIELD.

[180] **A comparison of the tension of the retinal arteries and of the cerebrospinal fluid** (Tension rétinienne et tension du liquide céphalorachidien).—H. CLAUDE, A. LAMACHE and J. DUBAR. *L'Encéphale*, 1927, xxii, 1.

THE systolic and diastolic pressure of the retinal arteries can now be studied by the tonometer of Bailliart, in the use of which ophthalmoscopic examination of the retinal artery on the disc during compression of the eyeball shows pulsation beginning at diastolic pressure and ending at systolic pressure. The authors compared the results obtained by this instrument with the blood pressure and cerebrospinal fluid pressure. The normal pressures in the retinal artery vary from 600 to 700 mm. of water for the systolic and from 300 to 350 mm. for the diastolic. As a general rule it was found that the diastolic retinal pressure bore a close relationship to that of the cerebrospinal fluid and varied with it when it was artificially raised or lowered. When the cerebrospinal fluid pressure was normal the retinal diastolic pressure varied with that of the general arterial system. But sometimes the retinal pressure was found to be unexpectedly high by comparison both with the arterial and the cerebrospinal fluid pressure. In some cases this appeared to be due to emotional stress at the time the retinal pressure was taken. In other cases, as in general paralysis, it was probably due to some local blockage to the outflow from the retinal veins or lymphatics. The authors recommend the examination of retinal pressure both in cases of suspected brain tumour where lumbar puncture is contraindicated, and in cases in which lumbar puncture has proved the existence of raised intracranial pressure when it is considered advisable to watch the effects of hypertonic solutions in reducing this.

J. G. GREENFIELD.

NEUROPATHOLOGY.

[181] **Pathologic changes in Huntington's chorea.**—C. R. DUNLAP. *Arch. of Neurol. and Psychiat.*, 1927, xviii, 867.

THE late Dr. Charles Dunlap has in this paper contributed a minute and painstaking account of the pathological changes in seventeen cases of Huntington's chorea. It would be hazardous to attempt a summary of the many points discussed, but Dr. Dunlap's views seem to amount to this, that in pure and well developed Huntington's chorea there are constant lesions of definite type in the corpus striatum and in the cerebral cortex and marrow which are characteristic enough to make a postmortem diagnosis of Huntington's chorea at least probable if not certain, for the peculiar combination of cortical changes and basal nuclear lesions is not reproduced in any other disease.

R. M. S.