

sistence of some ideas of persecution, the patient recovered in sixteen months. The third patient presented a cerebellar syndrome with the addition of some mental disturbance. The case simulating multiple sclerosis had lost knee and Achilles jerks. The case simulating tabes had no lightning pains, but in other respects was typical (the Wassermann reaction was positive). The author draws two conclusions: The diagnosis in these cases is difficult. These cases have as a basis an organic lesion. They are not hysterical or simulation.

2. *Alterations in Speech.*—They are divided into three classes: mutism, a stammering speech, and a high-pitched voice in which the patient speaks rapidly and irregularly.

3. *Mental Childishness.*—The patient, 21 years old, developed the condition following shell shock. He talked and acted like a child, occupied his time sailing boats, etc., and frequently cried in a childish way. There was no disorientation, no hallucinations and the neurologic examination was negative.

4. *Pensions.*—The fundamental question in the determination of the pension allowance in nervous or mental cases is whether or not the condition present is due to service in the war. The fatigue and emotions of war may act as a determining cause and the value attaching to the predisposing cause, whether hereditary or acquired, is the same as in civil life.

MISCELLANY

FURTHER CONTRIBUTIONS ON NEUROBIOTAXIS.—IX. AN ATTEMPT TO COMPARE THE PHENOMENA OF NEUROBIOTAXIS WITH OTHER PHENOMENA OF TAXIS AND TROPISM. THE DYNAMIC POLARIZATION OF THE NEURONE. C. U. Ariëns Kappers. (The Journal of Comparative Neurology, April, 1917.)

Kappers in this study seeks to understand further the phenomenon of taxis or tropism in the nervous system, to which he has earlier given the name of neurobiotaxis. It is a phenomenon which can be discovered in phylogenetic or in ontogenetic growth and development and refers to the shifting of groups of nervous cells through the dendrites and cell-bodies in the direction of the point whence the majority of stimuli proceed to the cell. The shifting of the abducens nucleus from the ventral position it occupies in the bony fish to its dorsal position in the shark is chosen as a striking illustration of this phenomenon.

Further study was needed, however, to explain why only certain cells approach this center and to account for the growth of the axis cylinder away from the center in the direction of the stimulus irradiation. The observation of the first phenomenon led to the recognition of the same law of association in the anatomical relation of the dendrites and cells in the nervous system which is operable in psychology. This leads to a new formulation, that the growth of the chief dendrite and the cell displacement take place only under a correlation of stimulation depending on simultaneity of function, which also has a part in the growth of the axis cylinder. It is briefly stated as a neurobiotactic law that neurobiotactic processes occur between correlated systems, the tropism of the dendrites and cell-body being stimulo-petal or toward the center of stimulation and the course of the axon stimulo-concurrent or in the direction of the current.

Bok's studies, resulting in his theory of "stimulogenous fibrillation," has shown that the axon is a product also of stimulation and must first be thus functionally formed before it is capable of transmitting stimuli. Bok proved that when an axis cylinder or a bundle of myelinated fibers grows out and passes nerve cells on its way, these nerve cells can be stimulated to send out

axis cylinders themselves in a direction perpendicular to the activating axon or fiber bundle.

There still remains to be explained the opposite polar difference by which part of the neuronic protoplasm approaches the center of stimulation while the other proceeds in the opposite direction. For this the author turns to galvano-tropisms and other tropisms which take place in living organisms. It is proved that a living being or part of it, placed in a constant electric current of certain strength, turns almost or quite without exception towards the electro-negative pole, the kathode. Increase of the strength of the fluid medium, solution of chlorid of sodium or potassium reverses the tropism to the opposite pole, the anode. Albumen and lecithin shift ordinarily to this opposite pole. The addition of acids, however, turns the albuminoids towards the negative pole.

The part of the nervous system which is stimulated, whether by sensory contact at the periphery or whether it is a primary growing axis cylinder, forms, as is well known, a negative pole, while its surroundings offer the anodic field for the stimulation. At first the anodotropic character of the protoplasm of the nerve cells will be manifest in the production of an anodic offshoot. To this will be added chemical and tropic characteristics of the potassium and chlorids of the medium. According to the experiments with other living cells the increased potassium chlorid in the growing axon further enhances this anodic character and moreover increases its conductivity. The dendrites do not appear until later, and their kathodic tropism together with that of the protoplasm of the cell-body is not interfered with by the presence in any considerable amount of potassium and chlorids. It is, as has been shown, in accordance with the phenomena of kathodic stimulation and is probably moreover favored by a kathodic kataphoresis, since the Nissl bodies or nuclear acid derivatives appear at the same time with it.

Polydendritism occurs because the perinuclear and dendritic protoplasm is everywhere sensitive to the kathodic influence and thus offers a response at several different places, while monoaxonism results as the effect of different forces on the same point and line of application. The neuron receives a compound impression from different perceptions, which it conducts along the axis cylinder to form higher, more complicated compounds in the cerebral direction or leads to a somatic effector center in the aboral direction.

Kappers does not claim for this study that it explains nervous life or its psychic realization but that these facts do give some idea of the physico-chemical processes that accompany its evolution and determine its form of expression. "Taken all in all, we can say that the stimuli which arrive in the nervous system, especially the relation between those stimuli, mold the material substratum of the mind; this correlation is the primary force, and expresses itself in the material arrangements of our nervous system."

JELLIFFE.

PREGNANCY AND TABES. E. M. Allen. (*Journal A. M. A.*, Sept. 22, 1917.)

Pregnancy rarely occurs in tabes, partly because of the predominance of men thus suffering and partly for other reasons. Allen has found a very scanty literature to refer to in the case he reports. The patient was a woman, aged 27, who had had two miscarriages since her first child; each of these was spontaneous and painless. She first began to be troubled with shooting pains of tabes about January, 1917, and they have continued to date. The labor in this case was indolent, but was expedited by the use of pituitary solution. It continued seventy-two hours or more. Both mother and child had a feverless, uneventful puerperium. There was no pain in the labor until the head was on the perineum and then less than usual.