

hear, although the same experiments made on the smooth dogfish (*Mustelus canis*) did not give any evidence of hearing.

He calls attention to the probable development of the ear from the lateral line organs, and of the lateral line organs from the skin, and concludes from some other experiments made with fishes whose lateral line organs had been rendered inoperative, that the skin is stimulated by the movement of the water in surface waves and currents, the lateral line organs by a slight inaudible trembling of the whole mass of water, and the ears by molecular vibrations conducted by the water.

He mentions a paper by Tullberg, who says that the ear in fishes is not an organ of equilibration, because fishes whose ears have been disconnected soon learn again to keep their equilibrium. Parker thinks that this is due to the experience of the fishes in judging their position by the eye. He agrees with Tullberg, however, in believing that the labyrinth is in some way connected with the reactions of a fish to a current of water.

MAX MEYER.

UNIVERSITY OF MISSOURI.

NEUROLOGICAL.

A Study of the Conductivity of the Nervous System. Prof. YUJIRO MOTORA, University of Tokyo, Japan. *Amer. Journal of Psychol.*, Vol. XIV., pp. 329-350.

Many years ago scientists tried to identify the nervous impulse with electricity. But experimental study has shown points of serious disagreement. The next theory was that nervous conduction is the result of some chemical change peculiar to nerve fibers. But the details of this chemical action are not known. The author believes that the field is thus open to propose an hydraulic theory.

He gives an account of five experiments. The apparatus used consists of rubber tubes of different lengths, diameters and elasticities, filled with water, together with such other accessories as are necessary to transmit and register the disturbance of the fluid in the tube. The experiments are carefully done, and although he takes fully into account that the analogies which he finds between nervous conduction and his results, are not conclusive proof, he feels that his hydraulic theory is as serviceable as the chemical or any other theory now given.

The author's expression is: "The hydraulic explanation supposes that nervous conduction is a transmission of a water wave in a protoplasmic tube and that the protoplasmic tube not only helps the trans-

mission by its own elasticity but is excitable at any point by means of a stimulus directly applied to it. The wave is, of course, equally transmitted in both directions. Moreover, this theory does not necessarily require a continuity of the path of conduction." For he has shown by experiment that mere contact of tubes or presence of a watery medium between two tubes is enough to transmit the stimulus. He says further, "If the water wave is to explain nervous conduction, it must be supplemented by the contraction of protoplasm, which forms the tube, to account for excitability."

The phenomena of attention and inhibition he very conveniently explains under the supposition of a protoplasmic tube.

CLAUDE E. PRICE.

INDIANA UNIVERSITY.

ABNORMAL AND PATHOLOGICAL.

Retroactive Amnesia: Illustrative Cases and Tentative Explanation. W. H. BURNHAM. American Journal of Psychology, 1903, Commemorative Number, 118-132.

The author opens his paper by defining the classes of amnesia: retrograde and retroactive. The former of the two refers to cases where 'memory is obliterated for a relatively long period preceding the immediate cause of the amnesia.' The latter, usually the result of a shock, 'extends for only a short period, a few minutes or a few hours immediately preceding the incident.'

Then follows a discussion of dissociation as met with in every day life: those frequent occurrences where one loses a name or an idea out of a chain of thought which otherwise remains quite clear. Simple dissociation of this sort is, of course, attributable to some inhibition in the associative continuity. If the inhibitory process can be removed, if the right motive for associating the forgotten factors can be supplied, then the entire sequence of ideas is reproducible.

A case of dissociation verging on the pathological is cited which has to do with a person walking along in a familiar neighborhood absorbed in thought. He suddenly arouses himself to find that he does not recognize his surroundings. The accustomed marks of familiarity, a church and certain houses, do not seem to possess their adjunct of recognition. At length a car comes along and he reads the sign which supplies a verbal idea which is recognized. He boards the car and gets safely away. This points to visual amnesia only. On another occasion the same person was set right by making verbal inquiry. The aural image supplied by the answer proved sufficient to reassociate his thought.