Agnosticism in Science

General Science

SIR JOHN PARSONS, in *Nature* (London):

The essence of the agnostic creed was a judicial suspicion of authority and the cultivation of suspension of judgment in regard to matters which are not yet susceptible to rigorous scientific proof. It cannot be doubted that the rise of the theory of relativity and the deductions therefrom have led to a weakening of scientific discipline and a too facile acceptance of plausible speculations. A reversion to the stricter canon of Tyndall and Huxley would be beneficial to all branches of science, and not least to physics, where hypotheses as to atomic structure, the constitution and life history of the stars, etc., are asseverated as facts with all the adamantine validity of the laws of the Medes and Persians. As Sir Arthur Keith has recently said, "The unfortunate position is that in this world there are men who will not be satisfied with not knowing"—an ambiguous remark which, however, as meant, embodies a great truth.

Science News-Letter, March 10, 1928

Visceral Autonomy

Physiology

WALTER C. ALVAREZ, in *The Mechanics of the Digestive Tract* (Hoeber): Now the most paralyzing thing in scientific work is a facile explanation which puts a stop to further curiosity without really advancing our knowledge of the subject, and I have never been able to see the value of pushing the explanation for a mechanical phenomenon out of the organ in which it might be studied, and into a tiny ganglion where it can hardly be followed. It seems to me that many even of the teachers of physiology have a wrong idea of the nervous system and its relation to the viscera. They look at it somewhat as an electrical power house which not only controls the activities, let us say, of the various trains running over a railroad, but supplies the motive force. My analysis of the literature makes me feel that we should look at it more as a telephone switchboard with wires which carry messages of warning and advice from one engineer to another. The trains supply their own power, and the difference in speed and other activities are due to peculiarities in the structure of the engines, peculiarities in fuel, differences in the gradient of the road, etc.

This idea comes out more clearly as we study the development of the nervous system in lower forms of life. First, we have the unicellular organisms which naturally have no difficulty with conduction and do not need nerves. Next, perhaps, come the sponges with muscles, but still no nerves. These muscles respond to direct mechanical stimulation transmitted through the overlying epithelium. There is a little conduction from muscle cell to muscle cell, but it is so slow and its spread is so limited that there is no coordination between the movements of adjacent fingers of the sponge. Next in the scale of development come the animals with nerve nets interposed between the epithelium and the muscles. Such a nerve net in the sea anemone enables the animal, when touched, to contract all over at one time. The stimulus spreads out through the net somewhat as ripples spread from a stone thrown into a pond. If the impulse is slight, only a few muscles will respond locally; but if the impulse is strong, every muscle in the animal will contract. A little higher in the scale we find nerve nets which are "polarized," that is, they conduct better in one direction than in another. We shall see later that Auerbach's plexus is probably to a considerable extent, "polarized." The trouble with this type of nervous system is that it is uncentralized. There is no single organ to which experiences can be referred or from which volitional impulses can emanate. Moreover, a stimulus at one point is likely to spread all over. These difficulties are overcome in the higher animals by the breaking up of the conducting paths into three relays, consisting of a sensory, a connector, and a motor neurone. The connections between these neurones are so made that impulses can pass in one direction only. Furthermore, by means of association fibers, impulses may travel to smaller or larger groups of muscles where they will bring about coordinated movements. The higher the animal is in the scale of existence, the more complicated and more numerous become these association fibers with their valvelike synapses.

Science News-Letter, March 10, 1928