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THE PHOTOCHEMISTRY OF THE SENSITIVITY OF ANIMALS TO LIGHT[1]

I

AN analysis of sensory stimulation, in order to be objective, must take its data from the relations between the properties of the stimulating agent and those of the responses of the animal. If the analysis is to be quantitative as well as objective, not only should the response be a qualitatively invariable reflex but, together with the source of stimulation, it should be capable of precise and easy control.

There are a number of animals which possess such characteristic responses. Typical of these are the ascidian, *Ciona intestinalis* and the long-neck clam, *Mya arenaria*. Both of these animals, when exposed to light, respond by a vigorous retraction of the siphons. It has therefore been possible to investigate quantitatively the properties of their photic sensitivity, and as a result to propose an hypothesis which accounts for this type of irritability in terms of an underlying photochemical mechanism.

I propose now to describe briefly the evidence which has been accumulated in this connection, and to present the outstanding features of the proposed hypothetical mechanism.

II

The photosensory activities of these animals possess four striking and important properties. (1) When exposed to light, the animal

[1] Delivered at the Symposium on General Physiology held by the American Society of Naturalists on December 30, 1920, at its Chicago meetings. The paper was illustrated with a number of charts which are not reproduced here. They may be found, together with the data on which this summary is based, in a series of articles in the *Journal of General Physiology* from 1918 to the present time.