

THE ACTION OF CERTAIN DRUGS AND POISONS ON THE HEART OF THE FISH.

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Last summer I was able to make an investigation on the physiology of the heart of the fish, Professor Brooks having kindly allowed me the advantages of the marine laboratory of the Johns-Hopkins University at Beaufort, North Carolina.

Part of this work consisted in an examination of the action of certain drugs and poisons on the heart, and so far as I know, for the first time for *this* animal.

Exceedingly little, if anything, is known of the action of such agents on the hearts of the cold-blooded animals, except in the case of the frog. This investigation demonstrates that in the fish the action of the drugs and poisons used is similar to what it has been shown to be for the frog by other investigators. (Ringer, Brunton, &c.) The results will be presented exactly as stated in my notes taken at the time, and without comment in most cases, leaving the reader to draw his own conclusions as to *mode* of action.

The fish chiefly used for these experiments was *Batrachus Tau*, popularly known as the "toad fish," a term indicating well its general appearance. It is a fish of great vital tenacity, and well suited in every way for physiological experiments generally. The hearts of most fishes are so easily rendered abnormal that the attempt to investigate them proves abortive; but the heart of *Batrachus* seemed so well suited for testing the action of drugs, etc., that a considerable number of experiments were made to ascertain their influence when directly applied to the heart. The drug was either applied in solution with a camel's hair pencil, or simply dropped over the heart; the fish meanwhile being kept under normal conditions (on its back, with seawater bathing its gills, etc.) That the effect witnessed on the heart was not due to indirect influence through the extrinsic nervous system of the fish was shown by isolating the heart and treating it with the same drug or poison as the heart *in situ*. The results have always been harmonious.