

Does the vagus nerve act directly on the heart muscle, or mediately through its nervous ganglia? Certainly Ransom has answered this question in favor of the former view, so far as the mollusks are concerned. How is it as to the frog, the chelonians, the fish, etc. Although I hold the view subject to correction by further observations, it seems to me that the evidence that the vagus in the animals specially examined by me (the chelonians, the alligator, and the fish) acts, or at least may act, *directly* on the heart muscle itself to produce those effects characteristic of the nerve. The evidence on which this opinion is based will be clearer after the consideration of my publication on the heart of the fish especially, some account of which will probably appear in this JOURNAL.

Another question much debated for the past fifteen years is: Does the vagus contain two sets of fibres with antagonistic influence—the one *depressors* of cardiac action and the other *augmentors*; or do the same fibres act at one time as augmentors and under different circumstances as depressors? This question, so far as the frog is concerned, has been settled in favor of the former view by Gaskell, though I have shown that this investigator is in error in supposing that the vagus nerve is a pure depressor in the *crocodilia*. Whether the vagus may not be such in certain animals requires further investigation; but it seems to be tolerably safe to assert that in all animals above fishes the vagus contains both depressor and augmentor fibres. At the same time, this has not been positively demonstrated for all; and among the other lessons taught us by these recent cardiac investigations is the danger of too wide generalization, and the desirability of subjecting as many animals as possible, even of closely allied structure, to examination.

It has been shown that similarity of anatomical structure is, in a general way, associated with similarity of function; but this is not invariably the case, and we have learned of not a few instances of “physiological isolation.” To some of these I shall have to refer in later papers.

Prior to my own investigations on the chelonians, and those of McWilliam and myself on the fish, carried on at the same time, though independently, very little was known of *reflex*