

kell rejected this explanation and held to a "trophic" action of the vagus, entering into a very elaborate explanation of the relation of the inhibitory phase and the after augmentation phase of the heart's action. Later, he has shown that in the frog there are two sets of fibres with different action, and that these fibres are respectively inhibiting fibres proper, which are medullated, and sympathetic fibres which are non-medullated.

Gaskell thought that in the *Crocodylia* he had found a vagus that was a pure depressor; but this I have shown in my paper on the Alligator (*Jour. of Anat. and Phys.*, Vol. XX) to be an error. The vagus in the crocodile tribe is similar in action to that in the Chelonians, etc.

I believe I was myself, however, the first to call attention, in a published paper, to general physiological resemblances between the main sympathetic chain in which the cardiac accelerators run, and the vagus. I pointed out (paper on Terrapin) that stimulation of this chain led to results similar to those obtained by stimulation of the vagus itself, and, indeed, that the same law applied—the worse the cardiac rhythm the more marked the influence. I also called attention to some after-effects (in some cases primary effects)—viz., irregularity or brief stops of the heart which were then difficult to explain. We know now that the two kinds of fibres, inhibitory proper and sympathetic, have in some respects an opposite action on the heart.

Throughout I have maintained that we must look finally for an explanation of these effects in chemistry, in tissue metabolism. Ransom proposed a problem which has since been, in part at least, solved—i.e., solved up to the crucial point. He says:

"If it could be shown that the true vagus fibres of a tortoise or frog in any way tend to increase constructive metabolism, while the sympathetic favored the destructive processes, a step would already be taken in harmonizing the phenomena presented by mollusca and vertebrata and in forming a general interpretation applicable to all."

Gaskell now thinks he has facts which lend strong support to such a view, though I find no mention in his latest paper of this conception as Ransom's; nor, indeed, any notice taken of the work of others, that has served to correct certain of his own