gator. Such study has enabled me to formulate the laws of vagus action with a completeness not previously possible, and especially that important law of *inverse proportion*, as I have called it, viz., *that the after-effect of vagus stimulation is inversely proportionate to the rate and force of the beat at the time of stimulation.* It follows that the worse the condition of the heart, and the more it needs assistance, the greater the capacity of the nervous system to render that help. This fact, which was never clearly brought out prior to my own investigations, has led me to assert, in the previous part of this paper, that I believed that our present explanations of the causes of heart diseases are too mechanical; and that the above facts—for facts they are and not theories—will, in the future, modify both our cardiac pathology and therapeutics.

The question as to *how* the vagus acts is very difficult, and one that cannot be fully answered until still more numerous observations have been accumulated.

Gaskell's views as to the mode of action of the ganglia in the heart-substance of the frog and land tortoise have been quoted in the first instalment of this paper; but since Gaskell wrote, certain facts have come to light which must render a modification of his views necessary.

Most remarkable was Ransom's discovery after very careful microscopic examination, that in the heart-substance of the highest class of mollusks there were *no* ganglion cells, while at the same time the vagus ("visceral") nerves had in the most remarkable manner a beneficial influence on heart work and heart nutrition. It seems to me it is difficult to over-estimate the value at the present time of such work as is now being done in this realm of comparative physiology. It is now clearly shown that ganglia are not, in all animals, essential to heart action or heart nutrition. We are led to enquire: Are they essential in the higher animals—are they so in mammals? The work for the mammalian heart is still to be done in great part; but in Ludwig's laboratory, Tigerstedt has, by one investigation, rendered it very doubtful that the movements of the heart are, even in mammals, absolutely dependent for their origin on nervous structures at all.