

from thermic, electric, and other forms of energy. This was the meaning attached to the phrase by the disciples of Haller, by Louis Dumas (1765-1813), by Reil (1759-1813), and the other early vitalists. It can only be said that an appeal to such a force violates the scientific method, and abandons the scientific problem. Again and again, in regard to particular points, subsequent progress has shown that the loss of faith in science was premature.

According to the hypothesis of vitalism the phenomena of life are inexplicable apart from a special vital force exclusively resident in organisms, and different from the chemico-physical energies of the inanimate world. Thus the great pathologist and anatomist Henle (d. 1885) believed in a non-material agent associated with the organism, "presiding over the metabolism of the body, capable of reproducing the typical form, and of endless partition without diminution of intensity".

It is altogether an error to suppose that a refusal to believe in such a special "vital force" implies materialism. The questions are quite separate; the former has to do with scientific method, the latter is a philosophical theory. Thus Huxley was certainly no believer in "a vital force", yet he was clearly an idealist; and the same might be said of many.

Every physiologist will, I believe, admit that he cannot at present give a physico-chemical interpretation of contractility or of irritability, of digestion or of absorption, of respiration or of circulation. What he can give is a partial analysis of these functions in simpler terms. This must remain the case until we discover the secret of the synthesis which the simplest unicellular organism expresses. In regard to some points the translation of vital functions into physico-chemical processes seems further off than it did twenty years ago, but that is because we are less readily satisfied.

The "neo-vitalists", such as Bunge and Rindfleisch, emphasize the fact that there is no present possibility of giving a complete chemico-physical restatement of any observed function; that there are always residual