

and in no sense determining their initial development."¹

It seems, then, that we can date back to Schwann's 'Researches' the origin of two distinct courses of Thought which in the second half of our century obtain in biological science. The first we may call the morphological or structural school of biology. It is based on the theory of the cell or some modified conception, and attempts to explain the fundamental processes which go on in living organisms from the structure of the elementary parts. As the most minute particles of

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¹ See Sir Michael Foster's excellent article on "General Physiology" in the 19th vol. of the 'Ency. Brit.,' 9th ed., p. 12. In this connection a passage from an early review of Huxley's, "On the Cell Theory," has been frequently quoted, according to which cells may be "no more the producers of the vital phenomena than the shells scattered in orderly lines along the sea beach are the instruments by which the gravitative force of the moon acts upon the ocean. Like these the cells mark only where the vital tides have been and how they have acted" (1853, in the 'Brit. and For. Med. Chirurg. Review,' reprinted in the first volume of 'Scientific Memoirs,' p. 277). According to this view, which has been further developed in more recent times, the cells would be "indications," not instruments, of the vital phenomena, which "are not necessarily preceded by organisation, nor are in any way the result or effect of formed parts, the faculty of manifesting them residing in the matter of which living bodies are composed, as such—or, to use the language of the day, the 'vital forces' are molecular

forces." It is interesting to quote together with this passage from Huxley, what was said forty years later by an eminent living physiologist, Prof. Max Verworn of Jena: "The fact has been established that a fundamental contrast between living organisms and inorganic bodies does not exist. In contradistinction to all inorganic nature, however, organisms are characterised solely by the possession of certain highly complex chemical compounds, especially proteids" ('General Physiology,' transl. by F. S. Lee, 1899, p. 126). "We can summarise our considerations and give simple expression to the problem of all physiology. *The life-process consists in the metabolism of proteids.* If this be true, all physiological research is an experiment in this field: it consists in following the metabolism of proteids into its details, and recognising the various vital phenomena as an expression of this metabolism which must result from it with the same inevitable necessity as the phenomena of inorganic nature result from the chemical and physical changes of inorganic bodies" (ibid., p. 136).