

24.
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in France, where a modified kind of vitalism still prevails.¹ It is the far-reaching influence of the reasoning which sprang out of Darwin's theory of descent.

¹ The older ideas of vital forces have in all the three countries been combated by authorities of the very first order, but, characteristically, in a very different manner — the phenomena of living bodies having been attacked from different sides. In Germany the mechanico-physical school was for a time the dominant one. In France the dominant school was the so-called experimental, also termed the vivisectional, school, founded by Magendie. Between these two extreme positions, both equally opposed to the older vitalism, there stood in the middle, with a less strongly pronounced antagonism to earlier conceptions, those who, like Liebig in Germany, Dumas and Boussingault in France, approached the phenomena of life mainly by the methods and reasoning of the new science of chemistry. This school had a profoundly modifying influence on the extreme views of the experimental school in France. It made itself felt mainly through Claude Bernard. In Germany this influence was felt later, after that of Darwinism had somewhat subsided. In England it was the doctrine of descent pure and simple which combated the older vitalism: the question became one of origins, and vitalism, as such, could be temporarily ignored. The facts of variation, overcrowding, natural selection, and inheritance, presented such a mass of material, waiting to be sifted and arranged by exact methods, that the problem of the essence of life and its beginnings was set aside. Accordingly, the attempts both of Darwin and Huxley to grapple with the central and final problem of vitalism are very few; the latter only repeating what had been said

long before him by thinkers of a very different school. The question was not answered, because, for the progress of the sciences and for their successful application in medicine, it did not require to be answered. It became a purely philosophical question, and the only English writer of authority who seriously grappled with it was Mr Herbert Spencer in his 'Principles of Biology.' Darwin in 1863 wrote to Hooker ('Life,' vol. iii. p. 18): "It is mere rubbish thinking at present of the origin of life; one might as well think of the origin of matter." Huxley, in a letter from the year 1884 ('Life,' vol. ii. p. 67), compares life with a whirlpool, a favourite simile of Cuvier's (see *supra*, vol. i. p. 129), but is doubtful as to comparing it with a machine. M. Delage names Chevreul ('Considérations générales sur l'analyse organique et ses applications,' 1824): "Il a eu le mérite d'écrire que la Force vitale n'explique rien, qu'elle aurait besoin elle-même d'être expliquée avant de prétendre expliquer autre chose, et que les phénomènes de la vie ont leur cause directe dans les principes immédiats constitutifs de la matière organisée. Il n'établit cependant sur cette donnée une théorie de la vie, car il conclut, au contraire, que, eût-on ramené les phénomènes vitaux à leurs causes prochaines et aux forces qui régissent la matière inorganique, on ne serait pas encore en état de comprendre comment l'être organisé en se reproduisant répète avec une constance si remarquable les caractères de son espèce." Even François Magendie, the great founder of the purely experimental school of physiology, says of Bichat's celebrated 'Recher-