

Haeckel's work is, as he himself admits, highly conjectural,¹ it has done much to extend and popularise the

whole domain of modern post-Darwinian biology. The problem is far from being solved, though it is perhaps nearer a solution than the question as to the cause of gravitation. Thirdly, there is the ambitious attempt to construct a general philosophy of life by means of the new principle, or some modification or amplification of it. After Newton had discovered universal gravitation, the attempt was made by Boscovich and the French school of mathematical physics to use the idea of attraction at a distance as a general physical theory. Of those who, before or after Darwin, attempted the more ambitious task, we may take Herbert Spencer, Ernst Haeckel, and Nägeli as three distinct representatives. They, however, agree in one point—viz., in considering natural selection to be insufficient, and in admitting other agencies, which are largely drawn from the suggestive writings of Lamarck. The section of these philosophical writers who consider Lamarck's principles to be more fundamental than Darwin's, and who are largely represented by American naturalists (notably E. D. Cope and A. Hyatt), are called neo-Lamarckians. The best account of their views will be found in the last chapter of Professor Packard's book, 'Lamarck, the Founder of Evolution' (1901). The following passage quoted there (p. 391) from a much earlier memoir (1877) gives a very clear account of the reasoning of this school: "Darwin's phrase, 'natural selection,' or Herbert Spencer's term, 'survival of the fittest,' expresses simply the final result, while the process of the origination of the new forms

which have survived, or been selected by nature, is to be explained by the action of the physical environments of the animals, coupled with inheritance-force. The phrases quoted have been misused to state the cause, when they simply express the result of the action of a chain of causes which we may, with Herbert Spencer, call the 'environment' of the organism undergoing modification; and therefore a form of Lamarckianism, greatly modified by recent scientific discoveries, seems to meet most of the difficulties which arise in accounting for the origination of species and higher groups of organisms." It is also well to note that Mr Wallace, though not a Lamarckian, considers the principle of natural selection insufficient especially to explain the higher developments of mental life. (See 'Darwinism,' p. 463, &c.)

¹ "It is evident that our 'phylogeny' is and remains an edifice of hypotheses in the same way as her sister, historical geology. For she tries to gain a connected view of the course and causes of events long past, the direct investigation of which is impossible. Neither observation nor experiment can give us direct information regarding the endless processes of change through which the existing animal and plant-forms have emerged out of lengthy ancestral stages. . . . The empirical documents of our history of descent will always remain largely incomplete, however much through continued discoveries our region of knowledge of individual things may increase." (Haeckel, 'Systematische Phylogenie,' 1894, vol. i. preface, p. vi.)