

pleasures and pains, and many of these acquired forms or propensities are transmitted to their posterity."

Lamarck (1744-1829) worked out with greater care than any of his predecessors a logically consistent theory of evolution. In many ways it closely resembled that of Erasmus Darwin, but there is no evidence that Lamarck was acquainted with his writings. Like Buffon, by whom he was undoubtedly influenced, he passed through a stage of avowed belief in the immutability of species, but, having reached an evolutionary position, he excelled his master in the courage of his convictions and in unwavering consistency. He was one of the first to free himself from the untenable conception of a linear genetic series, and to develop that of a branching genealogical tree (1809). In regard to the factors of evolution, he agreed with Buffon and differed from Erasmus Darwin as to the *direct* influence of the environment upon *plants*, which he believed to be directly modified by changes of soil, heat, light, &c.; on the other hand, as regards animals, he differed from Buffon and agreed with Erasmus Darwin as to the *indirect* action of the environment in evoking changed functional reactions. "Environment", he said, "can effect no direct changes whatever upon the organization of animals. But great changes in environment bring about changes in the habits of animals. Changes in their wants necessarily bring about parallel changes in their habits. If new wants become constant or very lasting they form new habits, the new habits involve the use of new parts, or a different use of old parts, which results finally in the production of new organs and the modification of old ones" (cit. Osborn, 1894, p. 168). As is well known, the fundamental postulate of Lamarck's theory was that changes acquired through functional reaction or direct environmental influence (in the case of plants) were transmissible. This he assumed without seeking to prove it, and apparently without thinking that it required proof.

Lamarck's four laws read as follows:—

I. Life, by its essential activities (*propres forces*), continually tends to increase the volume of every body