

different laws of Inheritance and Adaptation must be, we shall not be able to understand how these two functions, by themselves, have been able to produce all the variety of animal and vegetable forms, which, in fact, they have. We have, at least, hitherto been unable to discover any other formative causes besides these two, and if we rightly understand the necessary and infinitely complicated interaction of Inheritance and Adaptation, we do not require to look for other unknown causes for the change of organic forms. These two fundamental causes are, as far as we can see, completely sufficient.

Even long before Darwin had published his Theory of Selection, some naturalists, and especially Goethe, had assumed the interaction of two distinct formative tendencies—a conservative or preserving, and a progressive or changing formative tendency—as the causes of the variety of organic forms. The former was called by Goethe the centripetal or specifying tendency, the latter the centrifugal tendency, or the tendency to metamorphosis. These two tendencies completely correspond with the two processes of Inheritance and Adaptation. *Inheritance* is the *centripetal* or *internal formative tendency* which strives to keep the organic form in its species, to form the descendants like the parents, and always to produce identical things from generation to generation. *Adaptation*, on the other hand, which counteracts inheritance, is the *centrifugal* or *external formative tendency*, which constantly strives to change the organic forms through the influence of the varying agencies of the outer world, to create new forms out of those existing, and entirely to destroy the constancy or permanency of species. Accordingly as Inheritance or Adaptation pre-