

essentially dependent upon the material continuity and partial identity of the matter in the producing and produced organism, the parents and the child. In every act of breeding a certain quantity of protoplasm or albuminous matter is transferred from the parents to the child, and along with it there is transferred the *peculiar molecular motion* of the individual. These molecular phenomena of motion in the protoplasm, which call forth the phenomena of life, and are their active and true cause, differ more or less in all living individuals; they are of infinite variety.

*Adaptation*, or deviation, is, on the other hand, essentially the consequence of material influences, which the substance of the organism experiences from the material surrounding it,—from the *conditions of life* in the widest sense of the word. The external influences of these conditions are communicated to the individual parts of the body by the molecular processes of nutrition. In every act of Adaptation the individual molecular motion of the protoplasm, peculiar to each part, disturbs and modifies the whole individual, or part of it, by mechanical, physical, or chemical influences. The innate, inherited vital actions of the protoplasm—that is, the molecular phenomena of motion of the smallest albuminous particles—are therefore more or less modified by it. The phenomenon of Adaptation, or deviation, depends therefore upon the material influence which the organism experiences from its surroundings, or its conditions of existence; while the transmission by Inheritance is due to the partial identity of the producing and produced organism. These are the real, simple, mechanical foundations of the artificial process of breeding.

Now, Darwin asked himself, Does there exist a similar