life," the *direct* effects of struggle or labor on the individual, that is, the beneficial and other effects of struggle itself, are not intended, though not excluded; only the effects of struggle or strife on disappearings and survivals, under the changing conditions, are referred to.

Augmentation of variations by interbreeding fundamental in evolution. — Man, by selective breeding carried on for successive generations, has obtained cattle with long horns, short horns, and no horns; fowls with large combs on the head, with no combs, or with a rosette of feathers in place of the crested comb, with bare legs and with feathered legs, with long spurs and long legs for fighting, and with no spurs and short legs, and with great diversity of color; Pigeons with long bills and with short bills, giving them characters belonging to different tribes of Birds, with long or short legs, with the fanlike tail of a Peacock and an attendant increase in the number of feathers. And, similarly, diversity has been obtained in the case of many other species. The varieties obtained range through a vastly wider diversity of characters than occurs under any species in nature.

It is perceived that the law of nature here exemplified is not "like produces like," but like with an increment or some addition to the variation. Consequently, the law of nature, as regards the kingdoms of life, is not permanence, but change, evolution.

Great plasticity in organic structures under variant agencies. — This is another principle taught by the above-mentioned facts. This plasticity under any type is usually most prominent in one or two of the kinds of organs, and consequently it leads to the evolution of species in lines, determining genera or natural groups.

"A tendency upward," determined, in the Animal Kingdom, by the existence of a cephalic nervous mass or brain. — This principle is explained on page 439.

Articulates and Vertebrates first appear as multiplicate species: as exemplified in Worms, the earliest Crustaceans, and Fishes, and in the Myriapods, successors to the Worms. Through subsequent changes, types having a definite or normal number of parts are introduced, as Insects after Myriapods (page 721), Amphibians after Fishes (page 725), and so on.

In degeneration, Reptiles and Mammals, in some cases, have become multiplicate: as exhibited in the vertebræ and teeth, and sometimes in the phalanges and number of the digits. (Pages 797, 931.)

Natural selection not essential to evolution, variations being effectual without it. — The theory of natural selection is based on the assumption that variations come singly or nearly so, and that the selected are therefore few compared with the multitudes that disappear. The idea is derived from facts afforded by domesticated or cultivated races. But such races are in a large degree artificial products, selective methods carrying the individuals rapidly in the direction of the variation, and producing, in a few scores of generations, divergencies that in wild nature would require thousands of years. The structures are therefore in a strained or artificial state, and