be demonstrated in the simplest manner in man, as well as in domestic animals and cultivated plants, in which the vital conditions may be arbitrarily modified. Two brothers, of whom one is brought up as a workman and the other as a priest, develop quite differently in body as well as in mind; in like manner, two dogs of one and the same birth, of which one is trained as a sporting dog and the other chained up as a watch-dog. The same observation may also readily be made as to organic individuals in a natural state. If, for instance, one carefully compares all the trees in a fir or beech forest, which consists of trees of a single species, one finds that, among all the hundreds or thousands of trees, there are not two individual trees completely agreeing in size of trunk and other parts, in the number of branches, leaves, etc. Everywhere we find individual inequalities which, in part at least, are merely the consequences of the different conditions of life under which the trees have developed. It is true we can never say with certainty how much of this dissimilarity in all the individuals of every species may have originally been caused by indirect individual adaptation, and how much of it acquired under the influence of direct or universal adaptation.

A second series of phenomena of direct adaptation, which we may comprise under *the law of cumulative adaptation*, is no less important and general than universal adaptation. Under this name I include a great number of very important phenomena, which are usually divided into two quite distinct groups. Naturalists, as a rule, have distinguished, first, those variations of organisms which are produced *directly* by the permanent influence of external conditions (by the constant action of nutrition, of climate, of