

males for the possession of the females; and the result to the unsuccessful competitor is few or no offspring. It will not be necessary here to follow out the method in which this principle acts; it would seem, however, to be the cause of the modifications of the plumage in birds, and of the special means of defence of various male animals.

Natural Selection acts by the preservation and accumulation of infinitesimally small inherited modifications, each profitable to the preserved being. In this way varieties are produced, at first slightly, then strongly marked; and as the characters go on diverging the lesser difference between varieties becomes augmented into the greater difference between species.

Natural Selection also necessitates extinction. For, as we must suppose variations of all sorts to take place, some beneficial, others injurious, only the useful ones will be seized upon and preserved, while all the others will be ruthlessly destroyed as soon as they become injurious.

According to this theory the species now living are connected with older species by transitional forms or varieties, "species in process of formation;" these older species with others still more ancient, and so on; so that an infinite number of forms must have existed. The so-called transitional forms known to us are few in comparison with this countless multitude. Many more doubtless will be brought to light as the science of Palæontology grows older, but the geographical record is necessarily very imperfect, and the transitional forms must, from the very nature of Natural Selection, be of short duration. Therefore we must not be at all surprised if in many cases we do not see the connecting links between species. As Mr. Darwin says, "our ignorance of the laws of variation is profound. Not in one case out of a hundred can we pretend

to assign any reason why this or that part differs more or less from the same part in the parents. But whenever we have the means of instituting a comparison, the same laws appear to have acted in producing the lesser differences between varieties of the same species, and the greater differences between species of the same genus." He enumerates, however, some of the probable causes for this deviation in structure. It can easily be proved that the reproductive system is greatly influenced by changes in the conditions of life; and he believes that the varying or plastic condition of the offspring is to be attributed to the functional disturbance of this system in the parents. The direct effect of external conditions such as climate, food, etc., he thinks is very slight. Habit, use, and disuse seem to be more potent. Correlation of growth has great influence; multiple parts are very variable, because not having been closely specialized to any particular function, their modifications have not been closely checked by Natural Selection. Probably from the same reason, organic beings low in the scale are more variable than those higher up. Specific characters are more variable than generic characters. Secondary sexual characters are also highly variable, and parts developed in an unusual manner. Species descended from a common parent, and exposed to similar influences, will naturally tend to present analogous variations, and may occasionally revert to some of the characters of that parent.

The theory of evolution explains the nature of the affinities of all organic beings. All animals and plants, both existing and extinct, are related to each other in group subordinate to group, so that it is possible to arrange them all in varieties, species, genera, families, orders and classes, more or less closely connected with one an-