

different species; but no transition from those of a preceding into those of the following epoch has ever been noticed anywhere; and the question alluded to here is to be distinguished from that of the origin of the differences in the bulk of species belonging to two different geological eras. The question we are now examining involves only the fixity or mutability of species during one epoch, one era, one period in the history of our globe. And nothing furnishes the slightest argument in

this point from a want of knowledge of the facts, even though they seem to reason logically. A distinguished physician has recently taken up this subject of the immutability of species, and called in question the logic of those who uphold it. I will put his argument into as few words as possible, and show, I hope, that it does not touch the case. "Changes are observed from one geological period to another; species which do not exist at an earlier period are observed at a later period, while the former have disappeared; and though each species may have possessed its peculiarities unchanged for a lapse of time, the fact that when long periods are considered, all those of an earlier period are replaced by new ones at a later period, proves that species change in the end, provided a sufficiently long period of time is granted." I have nothing to object to the statement of facts, as far as it goes, but I maintain that the conclusion is not logical. It is true that species are limited to particular geological epochs; it is equally true that, in all geological formations, those of successive periods are different, one from the other. But because they so differ, does it follow that they have changed, and not been exchanged for, or replaced by others? The length of time taken for the operation has nothing to do with the argument. Granting myriads of years for each period, no matter how many or how few, the question remains simply this: When the change takes place, does it take place spontaneously, under the action of physical agents, according to their law, or is it produced by the intervention of an agency not in that way at work before or afterwards? A comparison may explain my view more fully. Let a lover of the fine arts visit a museum arranged systematically, and in which the works of the different schools are placed in chronological order; as he passes from one

room to another, he beholds changes as great as those the palæontologist observes in passing from one system of rocks to another. But because these works bear a closer resemblance as they belong to one or the other school, or to periods following one another closely, would the critic be in any way justified in assuming that the earlier works have changed into those of a later period, or to deny that they are the works of artists living and active at the time of their production? The question about the immutability of species is identical with this supposed case. It is not because species have lasted for a longer or shorter time in past ages, that naturalists consider them as immutable, but because in the whole series of geological ages, taking the entire lapse of time which has passed since the first introduction of animals or plants upon earth, not the slightest evidence has yet been produced that species are actually transformed one into the other. We only know that they are different at different periods, as are works of art of different periods and of different schools; but as long as we have no other data to reason upon than those geology has furnished, to this day, it is as unphilosophical and illogical, because such differences exist, to assume that species do change, and have changed, that is, are transformed, or have been transformed, as it would be to maintain that works of art change in the course of time. We do not know how organized beings have originated, it is true; no naturalist can be prepared to account for their appearance in the beginning, or for their difference in different periods; but enough is known to repudiate the assumption of their transmutation, as it does not explain the facts, and shuts out further attempts at proper investigations. See BARDEN POWELL'S *Essays*, quoted above; p. 412, et seq., and *Essay 3d*, generally.