

one of these differences had its cause in some peculiar contemporaneous physical condition — these strata succeed one another in a settled order over the same area — were deposited beneath the water on the same part of the bed of the sea ; it is certain, therefore, that in and about the same regions of the globe the physical conditions varied thousands of times during the formation of the series of strata. The mere inspection of one stratified rock composed of several *analogous* beds, gives a strong impression of elapsed time ; but when we see thousands of beds of *different* qualities, the mind is opened to the further evidence which geologists bring on this important subject.*

Many, indeed most, of these strata contain the remains of animals which were living in the water at or before the time of the deposition of the rocks, and several are full of plants which were swept down from the dry land on which they grew into the ancient ocean and then entombed in the strata at that epoch in progress of formation. By methods of undoubted accuracy, the length of life of some of these buried trees is ascertained to have been considerable — that they lived a hundred years for instance ; the shells entombed often show the growth from young to old during the formation of one or a few thin layers of rock. Thus, in many instances, we are forced to suppose the lapse of a period of years during the accumulation of even one thin bed of stone. And even if this conclusion were not circumstantially exact, if the shells of all ages, living together in the sea, were buried in one bed by one action, or

* The entire mass of our continents is composed of strata, similar in this respect to the regular courses of stones in our buildings. A succession of strata indicates a succession of time for their formation ; and the *change* from one species of stratum to another placed upon it, indicates a change of cause. Thus is the mass of our continents the product of successive operations, during which the producing causes have undergone successive changes. We see, moreover, that many of these strata contain the remains of animals ; and that in some successive strata these organized bodies are of different species. By this we judge that some considerable length of time was necessary for the formation of these strata, both on account of the succession of individuals of the same species of animals in some of them, and also on account of the change of species in the same places where the former are buried. — *De Luc's Letters.*