

of the earth alternate with one another in the course of millions of years, first this and then that part of the earth's surface is above or below the level of the sea. I have already given examples of this in the preceding chapter (vol. i. p. 361). Hence, in all probability, there is no part of the outer crust of the earth which has not been repeatedly above and also below the level of the sea. This repeated change explains the variety and the different composition of the numerous neptunic strata of rocks, which in most places have been deposited one above another in considerable thickness. In the different periods of the earth's history during which these deposits took place there lived various and different populations of animals and plants. When their dead bodies sank to the bottom of the waters, the forms of the bodies impressed themselves upon the soft mud, and imperishable parts, such as hard bones, teeth, shells, etc., became enclosed in it uninjured. These were preserved in the mud, which condensed them into neptunic rock, and as petrifications they now serve to characterize the respective strata. By a careful comparison of the different strata lying one above another, and the petrifications preserved in them, it has become possible to decide the relative age of the strata and groups of strata, and to establish, by direct observation, the principal eras of phylogeny, that is to say, the stages in history of the development of animal and vegetable tribes.

The different strata of neptunic rocks deposited one above another, which are composed in very various ways of limestone, clay, and sand, geologists have grouped together into an ideal System or Series, which corresponds with the whole course of the organic history of the earth, or with that portion