

without any material change of the present names, and he is persuaded that such an arrangement will take place in a more advanced state of the science, (see Chap. V.)

*Primary or Primitive Rocks*—were so called because no fossil remains of animals or vegetables, nor any fragments of other rocks, were found imbedded in them: hence it was supposed that they were formed prior to the creation of organic beings. The rocks of this class are for the most part extremely hard, and the minerals of which they are composed are frequently more or less perfectly crystallized. These rocks generally occur in immense masses or beds; they form the lowest part of the earth's surface with which we are acquainted, and they not only constitute the foundation on which rocks of the other classes are laid, but in many situations they pierce through the incumbent rocks and strata, and form also the highest mountains in alpine districts. We are not to conclude, when we see a mountain or range of mountains bounded by a plain, that the mineral beds and strata of which these mountains are formed terminate at their apparent bases; on the contrary, they dip under the surface at angles more or less inclined, stretching below the lower grounds and hills, and often rising again in remote districts.

That primary rocks environ the whole globe will not admit of direct proof; but, from their frequent occurrence in mountainous districts in the most distant parts of the world that have been examined, we may infer that some of the rocks of this class constitute the foundation rock of every country. We have no means of ascertaining that the similar rocks of distant districts were formed at the same time, nor can we be certain that the rocks called Primary, have not once contained organic remains, that were destroyed during the process by which they acquired their present crystalline structure. We may however, with apparent probability, infer that their formation was prior to the existence of animals or vegetables on our planet in its present state, because the rocks which immediately cover them contain almost exclusively the organic remains of the lowest class of animals, which are considered as forming the first link in the chain of animated beings. On this account these rocks have been called by the German geologists *transition* rocks, from the supposition that they were formed when the world was passing from an uninhabitable to a habitable state.

*Transition or intermediate rocks* are generally less crystalline than the primary; they contain occasionally organic remains of the lower classes of animals, and also fragments of rocks of the primary class. They are frequently interposed between rocks of the primary class, and those more generally called secondary, and often partake of the character belonging to both. The prevailing rocks in the transition series are limestone, slate, called clayslate, and coarse slate, passing sometimes into sandstone, and conglomerate; this has been called by the Germans *grau wacké*, or grey wacke. The rocks of the pri-