

tion and some chemical agent transfused by water through the mass, it has become converted into detrital fossiliferous rock. Buried afterwards beneath vast accumulations of other rocks, the heat has increased and hot water has permeated the strata, reducing them to a state more or less plastic, causing a crystalline to take the place of a mechanical structure, obliterating the fossils, and substituting cleavage or foliation for lamination. In some cases the heat might be so great that all traces of stratification are blotted out, and granitic or trappean rocks are the result. It may be, after all this, that erosion has again converted these rocks into detritus, and the process of deposition and of metamorphism begins again; nor can we tell how many times these changes may have been repeated. When they have passed through one cycle of change, they are as fresh as ever to commence another.

9. *The final conclusion is, that the entire crust of the globe has undergone metamorphism, and is not now in the condition in which it was created.*—We are sure that every part of it has been in a molten state; and we have every reason to suppose that every part of it has gone through other changes; nor is there any evidence that a portion of the first consolidated crust remains.

Men are accustomed to look upon the solid rocks as emblems of permanency. But in fact science teaches us that they are in a constant state of flux. They may be permanent when measured by the life of an individual, but when we compare their condition in the different and vast geological periods, change is the most impressive lesson they teach; and all those changes most wisely and beneficently ordered.

To give an idea of the extent to which rocks have been metamorphized, we subjoin the following section of the stratified rocks, with the names on the right of the azoic rocks into which we know from reliable observation the fossiliferous have been transformed. It must not be understood that the two kinds are generally interstratified, though they are sometimes so; but usually the azoic are proved to be identical with the fossiliferous by following the line of their strike and finding a gradual change from one into another. Or when a part of a formation is found to be azoic, it is the lower part; and even though it be as high in the series as the tertiary, none but azoic rocks will be found beneath it. This shows that the metamorphic action is deep seated, and