

(figs. 3, 12, and 57). This, according to the theory long ago proposed by Elie de Beaumont, and adopted by De la Beche in his 'Researches in Theoretical Geology,' is the origin of mountain chains. After water took its place on the earth, by such processes land was again and again raised within the influence of atmospheric disintegration, and rain, rivers, and the sea, acting on it, were enabled to distribute the materials of sedimentary strata. Such disturbances of strata have been going on through all known geological time, and I firmly believe are still in progress.

Such shrinkage and crumpling, where it has been most intense and on the greatest scale, is often (where I know it) accompanied by the appearance of gneissic or other metamorphic rocks, and often of granite or its allies.

The oldest rock in the British Islands is gneiss, but that originally was doubtless a common stratified formation of some kind or other. In fact, as far as the history told by the rocks themselves informs us, we cannot get at their beginning, for all strata have been made from the waste of rocks that existed before; and therefore the oldest stratified rocks, whether metamorphosed or not, have a derivative origin.

I must now briefly endeavour to give an idea of the theory of metamorphism. The simplest kind is of that nature mentioned in Chapter I. namely, when melted matter has been forced through or overflows a stratified rock, and remaining for a time in a melted state, an alteration of the stratified rock in immediate contact with it takes place. Thus sandstone may, by that process, become converted into quartz-rock, which is no longer hewable, like ordinary sandstone, but breaks with a hard and splintery fracture. Here then rocks