

swallowed up at once in unfathomable subterranean abysses. If cavities be formed, they will be enlarged gradually, and as gradually filled. We read, indeed, accounts of engulfed cities and areas of limited extent which have sunk down many yards at once; but we have as yet no authentic records of the sudden disappearance of mountains, or the submergence or emergence of great islands. On the other hand, the creeps in coal mines* demonstrate that gravitation begins to act as soon as a moderate quantity of matter is removed even at a great depth. The roof sinks in, or the floor of the mine rises, and the bent strata often assume as regularly a curved and crumpled arrangement as that observed on a grander scale in mountain-chains. The absence, indeed, of chaotic disorder, and the regularity of the plications in geological formations of high antiquity, although not unfrequently adduced to prove the unity and instantaneousness of the disturbing force, might with far greater propriety be brought forward as an argument in favour of the successive application of some irresistible, but moderated force, such as that which can elevate or depress a continent.

CHAPTER XII.

DIFFERENCE IN TEXTURE OF THE OLDER AND NEWER ROCKS.

Consolidation of fossiliferous strata—Some deposits originally solid—Transition and slaty texture—Crystalline character of Plutonic and Metamorphic rocks—Theory of their origin—Essentially subterranean—No proofs that they were produced more abundantly at remote periods.

ANOTHER argument in favour of the dissimilarity of the causes operating at remote and recent eras has been derived by many geologists from the more compact, stony, and crystalline texture of the older as compared to the newer rocks.

Consolidation of strata.—This subject may be considered, first, in reference to the fossiliferous strata; and, secondly, in reference to those crystalline and stratified rocks which contain no organic remains, such as gneiss and mica-schist. There can be no doubt that the former of these classes, or the fossiliferous, are generally more compact and stony in proportion as they are more ancient. It is also certain that a great part of them were originally in a soft and incoherent state, and that they have been since consolidated. Thus we find occasionally that shingle and sand have been agglutinated firmly together by a ferruginous or siliceous cement, or that lime in

* See Lyell's Manual of Elementary Geology, ch. 5.