

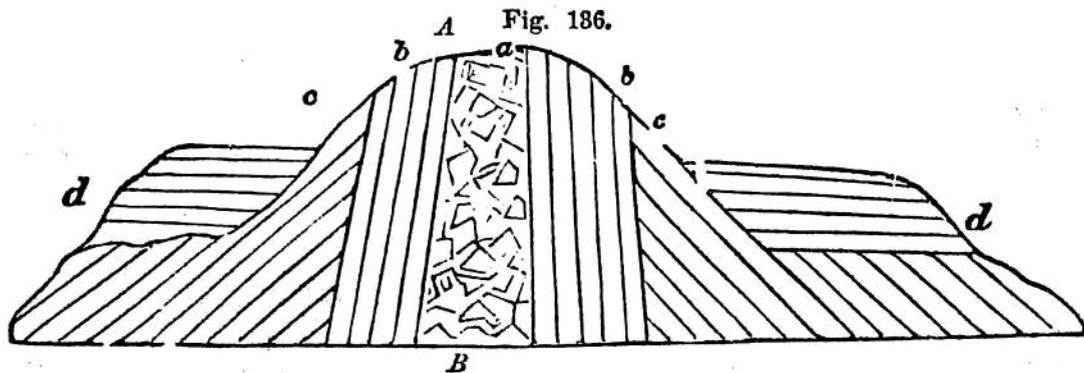
the oceans. These facts are in accordance with the general principle, that the nearer the water the hotter the fire.

So, too, the strata along the borders are contorted and often overturned, while in the interior they have scarcely been disturbed from their original position. Hence the general principle, that the nearer the water, the vaster the plications of the rocks.

Professor Dana holds that this continent has always had the same shape it now has; that from the earliest times it has gradually been growing, just as a tree continues to increase in size, retaining the same proportions; and that all the continents have always been the more elevated portions of the crust, and the oceanic basins have always been the more depressed portions of the crust.

ELEVATION OF MOUNTAINS AND SYSTEMS OF MOUNTAINS.

The present configuration of the earth's surface has been acquired gradually. The different parts of each continent appear to have been elevated at different epochs. Mountain ranges are not the result of denudation, but of elevation.



Let A B, Fig. 136, represent a mountain range, with an axis, *a*, of unstratified rock. Let the three systems of strata, *b b*, *c c* and *d d*, rest upon the axis *a*, and upon one another, unconformably, and dip at different angles, except *d d*, which suppose horizontal. Now it is obvious that the formations *c c* and *b b* must have been elevated previous to the deposition of *d d*; otherwise the latter would have partaken of the upward movement. And if there be no regular member of the series of rocks wanting between *d* and *c*, it is obvious that we thus ascertain the geological though not the chronological epoch, when *c c* was elevated. *c c*, however, is unconformable to *b b*; and therefore *b b* was partially elevated before the deposition of *c c*; in other words, *b b* has experienced at least two vertical movements. Now this is a just representation of the actual state of things in the earth's crust; and hence, by ascertaining the dip of the formations that are in juxtaposition, we ascertain the different epochs of elevation.

By the application of these principles, it is found that the mountains of Europe have been elevated at no less than twenty-four different epochs: the