uncertain proportions, by the mantle of bold and gratuitous hypothesis.

So soon as we find evidence of continents and oceans we raise the question, Have these continents existed from the first in their present position and form, or have the land and water changed places in the course of geological time? This question also deserves a separate and more detailed consideration. In reality both statements are true in a certain limited sense. On the one hand, any geological map whatever suffices to show that the general outline of the existing land began to be formed in the first and oldest crumplings of the crust. On the other hand, the greater part of the surface of the land consists of marine sediments which must have been deposited when the continents were in great part submerged, and whose materials must have been derived from land that has perished in the process, while all the continental surfaces, except, perhaps, some high peaks and ridges, have been many times submerged. Both of these apparently contradictory statements are true; and without assuming both, it is impossible to explain the existing contours and reliefs of the surface.

In exceptional cases even portions of deep sea have been elevated, as in the case of the Polycistine deposits in the West Indies; but these exceptions are as yet scarcely sufficient to prove the rule.

In the case of North America, the form of the old nucleus of Laurentian rock in the north already marks out that of the finished continent, and the successive later formations have been laid upon the edges of this, like the successive loads of earth dumped over an embankment. But in order to give the great thickness of the Palæozoic sediments, the land must have been again and again submerged, and for long periods of time. Thus, in one sense, the continents have been fixed; in another, they have been constantly fluctuating. Hall and Dana have well illustrated these points in so far as eastern North America