

the sedimentary rocks of the earth's crust was accumulated close to land, and that no trace of really abysmal deposits is to be found among them. From these considerations we are led up to the conclusion that the present continental areas must have been terrestrial regions of the earth's surface from a remote geological period. Subject to repeated oscillations, so that one tract after another has disappeared and reappeared from beneath the sea, the continents, though constantly varying in shape and size, have yet, I believe, maintained their individuality. We may infer, likewise, that the existing ocean-basins have probably always been the great depressions of the earth's surface.¹

Geologists are now generally agreed that it is mainly to the effects of the secular contraction of our planet that the deformations and dislocations of the terrestrial crust are to be traced. The cool outer shell has sunk down upon the more rapidly contracting hot nucleus, and the enormous lateral compression thereby produced has thrown the crust into undulations, and even into the most complicated corrugations.² Hence, in the places where the crust has yielded to the pressure, it must have been thickened, being folded or pushed over itself, or being perhaps thrown into double bulges, one portion of which rises into the air, while the

¹ See J. D. Dana, *Amer. Journ. Sci.* (2) ii. 1846, p. 352; "Geology" in "Wilkes' Exploring Expedition," 1849; *Amer. Journ. Sci.* (2) xxii. 1856; "Manual of Geology," 1863, 2d edit. 1874, 3d edit. 1880; Darwin, "Origin of Species," 1st edit. p. 343; L. Agassiz, *Bull. Mus. Comp. Zool.* 1869; vol. i. No. 13; J. D. Whitney, *Mem. Mus. Comp. Zool. Harvard*, vii. No. 2, p. 210. See also *Proc. Roy. Geograph. Soc.* new ser. i. 1879, p. 422. The contrary view that land and sea have continually changed places over the surface of the globe was held by Lyell, and is still maintained by some geologists. For a statement of geological evidence in favor of this interchange of terrestrial and marine areas the student may consult the memoirs of the late Prof. Neumayr, cited on p. 1477.

² The Rev. O. Fisher in his "Physics of the Earth's Crust," maintains that the secular contraction of a solid globe through mere cooling will not account for the observed phenomena. See ante, p. 105.