domes of trachyte, and cones of basalt, by the elastic forces emanating from the fluid interior of our globe, has led one of the first geologists of the age, Leopold von Buch, to the theory of the elevation of continents, and of mountain chains generally. This action of subterranean forces in breaking through and elevating strata of sedimentary rocks, of which the coast of Chili, in consequence of a great earthquake, furnished a recent example, leads to the assumption that the pelagic shells found by M. Bonpland and myself on the ridge of the Andes, at an elevation of more than 15,000 English feet, may have been conveyed to so extraordinary a position, not by a rising of the ocean, but by the agency of volcanic forces capable of elevating into ridges the softened crust of the earth.

I apply the term *volcanic*, in the widest sense of the word, to every action exercised by the interior of a planet on its external crust. The surface of our globe, and that of the moon, manifest traces of this action, which in the former, at least, has varied during the course of ages. Those who are ignorant of the fact that the internal heat of the earth increases so rapidly with the increase of depth that granite is in a state of fusion about twenty or thirty geographical miles below the surface,* can not have a clear conception of the causes, and the simultaneous occurrence of volcanic eruptions at places widely removed from one another, or of the extent and intersection of *circles of commotion* in earthquakes, or of the uniformity of temperature, and equality of chemical composition observed in thermal springs during a long course of years. The quantity of heat peculiar to a planet is, however, a matter of such importance—being the result of its primitive condensation, and varying according to the nature and duration of the radiation—that the study of this subject may throw some degree of light on the history of the atmosphere, and the distribution of the organic bodies imbedded in the solid crust of the earth. This study enables us to understand how a tropical temperature, independent of latitude (that is, of the distance from the poles), may have been produced by deep fissures remaining open, and exhaling heat from the in-

* The determinations usually given of the point of fusion are in general much too high for refracting substances. According to the very accurate researches of Mitscherlich, the melting point of granite can hardly exceed 2372° F.

[Dr. Mantell states in *The Wonders of Geology*, 1848, vol. i., p. 34, that this increase of temperature amounts to 1° of Fahrenheit for every fifty-four feet of vertical depth.]—*Tr.*