

unequivocally manifest; and, although the influence of high temperature was seen in the altered character of rocks in contact with ancient lava currents, yet its effects were comparatively but feebly displayed. The metamorphic rocks, on the contrary, present unquestionable proofs of their igneous origin; and many can scarcely be distinguished from the products of modern volcanoes. To unveil the mystery in which their origin is involved, we must, consequently, as in our previous inquiry, examine those natural operations which are producing analogous results; I purpose, therefore, in this place, to review the phenomena presented by existing volcanoes.

Volcanic action is defined by Humboldt to be the influence exercised by the internal heat of a planet on its external surface, during its different states of refrigeration; by which concussions of the land, or earthquakes, and the elevation and subsidence of large portions of the solid crust, are produced. The number of existing volcanoes is estimated at about 200, of which 116 are situated in America, or its islands. In the previous discourses, many of the effects of igneous agency were noticed, namely, the subsidence and elevation of the Temple of Serapis (p. 94); the gradual rise of Scandinavia (p. 104); the upheaving of the sea-coast of Chili (p. 99); and other changes of a like nature. As we successively examined the tertiary and secondary formations, proofs that similar phenomena had taken