the fluid surface," and develop extraordinary chemical energy and fearful mechanical violence. What are these causes? and what is the condition of the subjacent fluid masses whose repose they disturb?

Hypotheses of Volcanic Action.

To answer the questions just proposed, is the object of a just theory of volcanic action. The conditions already established, of the great extent of the phenomena, the appearance of volcanic fires in every kind of rock, and the continuity of such operations not only through historical but through earlier geological periods, negative completely the trifling notion of any particular combustible substances, or decomposable chemical compounds, being sufficient to maintain such long-enduring and powerful operations of heat. We must adopt larger and yet more definite views on the subject. No supposition will be of the smallest value, which provides an agency inferior to the area, unequal to the mechanical violence, or inconsistent with the chemical characters of volcanic excitement.

Accordingly, only two hypotheses have been deemed worthy of attention in the modern consideration of this subject. Humboldt, Cordier, and other eminent geologists, reviving the opinion of Leibnitz, look upon volcanic action as the necessary result of the influence exerted by the heated interior upon the cooled exterior masses of the globe. If the earth be now generally hot within, it must formerly have been hotter; in the process of cooling, the exterior solidified part and the interior fluid parts contract unequally, a general pressure and tension result, and the crust breaks locally to restore the equilibrium. Hence earthquakes, and fissures, on some of which volcanic vents are established, which serve more or less to relieve the subterranean pressure, as earthquakes also do. If, in addition to this general view, we suppose the admission of water through fissures to particular parts of the "ocean