

substances, has himself renounced his bold chemical hypothesis in his last work (*Consolation in Travel, and last Days of a Philosopher*)—a work which can not fail to excite in the reader a feeling of the deepest melancholy. The great mean density of the earth (5.44), when compared with the specific weight of potassium (0.865), of sodium (0.972), or of the metals of the earths (1.2), and the absence of hydrogen gas in the gaseous emanations from the fissures of craters, and from still warm streams of lava, besides many chemical considerations, stand in opposition with the earlier conjectures of Davy and Ampère.* If hydrogen were evolved from erupted lava, how great must be the quantity of the gas disengaged, when, the seat of the volcanic activity being very low, as in the case of the remarkable eruption at the foot of the Skaptar Jokul in Iceland (from the 11th of June to the 3d of August, 1783, described by Mackenzie and Soemund Magnussen), a space of many square miles was covered by streams of lava, accumulated to the thickness of several hundred feet! Similar difficulties are opposed to the assumption of the penetration of the atmospheric air into the crater, or, as it is figuratively expressed, the *inhalation of the earth*, when we have regard to the small quantity of nitrogen emitted. So general, deep-seated, and far-propagated an activity as that of volcanoes, can not assuredly have its source in chemical affinity, or in the mere contact of individual or merely locally distributed substances. Modern geognosy† rather seeks the cause of this activity in the increased temperature with the increase of depth at all degrees of latitude, in that powerful internal heat which our planet owes to its first solidification, its formation in the regions of space, and to the spherical contraction of

* See Berzelius and Wöhler, in Poggend., *Annalen*, bd. i., s. 221, and bd. xi., s. 146; Gay-Lussac, in the *Annales de Chimie*, t. x., xii., p. 422; and Bischof's *Reasons against the Chemical Theory of Volcanoes*, in the English edition of his *Wärmelehre*, p. 297-309.

† [On the various theories that have been advanced in explanation of volcanic action, see Daubeney *On Volcanoes*, a work to which we have made continual reference during the preceding pages, as it constitutes the most recent and perfect compendium of all the important facts relating to this subject, and is peculiarly adapted to serve as a source of reference to the *Cosmos*, since the learned author in many instances enters into a full exposition of the views advanced by Baron Humboldt. The appendix contains several valuable notes with reference to the most recent works that have appeared on the Continent, on subjects relating to volcanoes; among others, an interesting notice of Professor Bischof's views "on the origin of the carbonic acid discharged from volcanoes," as enounced in his recently published work, *Lehrbuch der Chemischen und Physikalischen Geologie*.]—Tr.