

each other, any serious disturbance of that pressure might be expected to make itself evident by a change in the condition of the volcano. Accordingly, it has long been remarked by the fishermen of the Lipari Islands that in stormy weather there is at Stromboli a more copious discharge of steam and stones than in fine weather. They make use of the cone as a weather-glass, the increase of its activity indicating a falling, and the diminution a rising barometer. In like manner, Etna, according to Sartorius von Waltershausen, is most active in the winter months. Mr. Coan has indicated a relation between the eruptions of Kilauea and the rainy seasons of Hawaii, most of the discharges of that crater taking place within the four months from March to June.³⁵

When we remember the connection, now indubitably established, between a more copious discharge of fire-damp in mines and a lowering of atmospheric pressure, we may be prepared to find a similar influence affecting the escape of vapors from the upper surface of the lava-column of a volcano; for it is not so much to the lava itself as to the expansive vapors impregnating it that the manifestations of volcanic activity are due. Among the Vesuvian eruptions since

³⁵ Dana, "Characteristics of Volcanoes," p. 125. For accounts of the volcanic phenomena of Hawaii, see W. Ellis, "Polynesian Researches." Wilkes' U. S. Exploring Expedition, 1838-42, "Geology," by J. D. Dana. The Rev. T. Coan, a missionary resident in Hawaii, observed the operations of the volcanoes for upward of forty years, and published from time to time short notices of them in the American Journal of Science, vols. xiii. (1852) xiv., xv., xviii., xxi., xxii., xxiii., xxv., xxvii., xxxvii., xl., xliii., xlvii., xlix; 3d ser. ii. (1871) iv., vii., viii., xiv., xviii., xx., xxi., xxii. (1881). Prof. Dana has recently revisited these volcanoes and fully discussed their phenomena in the Amer. Journ. Sci. vols. xxxiii.-xxxvii. (1887-89), and in his "Characteristics of Volcanoes." See also C. E. Dutton, Amer. Journ. Sci. xxv. (1883), p. 219; Report U. S. Geological Survey, 1882-83. L. Green, "Vestiges of the Molten Globe," 1887. For an account of the remarkable glassy lavas of Hawaii, see E. Cohen, Neues Jahrb. 1880 (ii.), p. 23; and a general account of the petrography of the islands, by E. S. Dana, Amer. Journ. Sci. xxxvii. (1889), p. 441.