

Java, whereby a steaming lake of hot acid water was discharged with frightful destruction down the slopes of the mountain. After the explosion, the basin filled again with water, but its temperature was no longer high.¹³

In many cases, the water rapidly collects volcanic dust as it rushes down, and soon becomes a pasty mud; or it issues at first in this condition from the volcanic reservoirs after violent detonations. Hence arise what are termed mud-lavas, or aqueous lavas, which in many respects behave like true lavas. This volcanic mud eventually consolidates into one of the numerous forms of tuff, a rock which, as has been already stated (p. 238), varies greatly in the amount of its coherence, in its composition, and in its internal arrangement. Obviously, unless where subsequently altered, it cannot possess a crystalline structure like that of true lava. As a rule, it betrays its aqueous origin by more or less distinct evidence of stratification, by the multifarious pebbles, stones, blocks of rock, tree-trunks, branches, shells, bones, skeletons, etc., which it has swept along in its course and preserved within its mass. Sections of this compacted tuff may be seen at Herculaneum.¹⁴ The *trass* of the Brohl Thal and other valleys in the Eifel district, referred to on p. 242, is another example of an ancient volcanic mud.

¹³ See Junghuhn's "Java." For an account of the volcanoes of the Sunda Island and Moluccas, see F. Scheider, *Jahrb. Geol. Reichsanst. Vienna*, xxxv. (1885), p. 1. Consult also for the Javanese volcanoes the works on Krakatoa quoted on p. 362.

¹⁴ Mallet thought that the so-called "mud-lavas" of Herculaneum and Pompeii were not aqueous deposits (*Journ. Roy. Geol. Soc. Ireland*, IV. (1876), p. 144). But there seems no reason to doubt that while an enormous amount of ashes fell during the eruption of A.D. 79, there were likewise, especially in the later phases of eruption, copious torrents of water that mingled with the fine ash and became "mud-lavas." The sharpness of outline and the absence of any trace of abdominal distension in the molds of the human bodies found at Pompeii, probably show that these victims of the catastrophe were rapidly enveloped in a firm coherent matrix which could hardly have been mere loose dust. See H. J. Johnston-Lavis, *Q. J. Geol. Soc.* xl. p. 89.