through the sheet of mud, and by degrees a new series of mounds is once more thrown up.

There can be little doubt that this type of mud-volcano is to be traced to chemical changes in progress underneath. Dr. Daubeny explained them in Sicily by the slow combustion of beds of sulphur. The frequent occurrence of naphtha and of inflammable gas points, in other cases, to the disengagement of hydrocarbons from subterranean strata.[98]

(2) The second class of mud-volcano presents itself in true volcanic regions, and is due to the escape of hot water and steam through beds of tuff or some other friable kind of rock. The mud is kept in ebullition by the rise of steam through it. As it becomes more pasty and the steam meets with greater resistance, large bubbles are formed which burst, and the more liquid mud from below oozes out from the vent. In this way, small cones are built up, many of which have perfect craters atop. In the Geyser tracts of the Yellowstone region, there are instructive examples of such active and extinct mud-vents. Some of the extinct cones there are not more than a foot high, and might be carefully removed as museum specimens.

Mud-volcanoes occur in Iceland, Sicily (Maccaluba), in many districts of northern Italy, at Tamar and Kertch, at Baku on the Caspian, near the mouth of the Indus, and in other parts of the globe.[99]

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[98] The "burning hills" of Turkestan are referred to the subterranean combustion of beds of Jurassic Coal. J. Muschketoff, Neues Jahrb. 1876, p. 516.

[99] On mud-volcanoes, see Bunsen, Liebig's Annual, lxiii. (1847), p. 1; Abich, Mem. Acad. St. Petersburg, 7e. ser. t. vi. No. 5, ix. No. 4; Daubeny's "Volcanoes," pp. 264, 539; Buist, Trans. Bombay Geograph. Soc. x. p. 154; Roberts, Journ. Roy. Asiatic Soc. 1850; De Verneuil, Mem. Soc. Geol. France, iii. (1838), p. 4; Stiffe, Q. J. Geol. Soc. xxx. p. 50; Von Lasaulx, Z. Deutsch. Geol. Ges. xxxi. p. 457; Gümbel, Sitzb. Akad. Münch. 1879; F. R. Mallet, Rec. Geol. Surv. India, xi. p. 188. H. Sjögren, Jahrb. Geol. Reichsanst. xxxvii. (1887), p. 233.