

Mud-Volcanoes.—These are of two kinds: 1st, where the chief source of movement is the escape of gaseous discharges; 2d, where the active agent is steam.

(1) Although not volcanic in the proper sense of the term, certain remarkable orifices of eruption may be noticed here, to which the names of *mud-volcanoes*, *salses*, *air-volcanoes*, and *maccalubas* have been applied (Sicily, the Apennines, Caucasus, Kertch, Tamar). These are conical hills formed by the accumulation of fine and usually saline mud, which, with various gases, is continuously or intermittently given out from the orifice or crater in the centre. They occur in groups, each hillock being sometimes less than a yard in height, but ranging up to elevations of 100 feet or more. Like true volcanoes, they have their periods of repose, when either no discharge takes place at all, or mud oozes out tranquilly from the crater, and their epochs of activity, when large volumes of gas, and sometimes columns of flame, rush out with considerable violence and explosion, and throw up mud and stones to a height of several hundred feet. The gases play much the same part, therefore, in these phenomena that steam does in those of true volcanoes. They consist of marsh-gas and other hydrocarbons, carbon-dioxide, sulphuretted hydrogen, and nitrogen, with petroleum vapors. The mud is usually cold. In the water occur various saline ingredients, among which common salt generally appears; hence the name, *Salses*. Naphtha is likewise frequently present. Large pieces of stone, differing from those in the neighborhood, have been observed among the ejections, indicative doubtless of a somewhat deeper source than in ordinary cases. Heavy rains may wash down the minor mud-cones and spread out the material over the ground; but gas-bubbles again appear