sides and bottom of a crater with a noise like that made by the steam blown off by a locomotive. The number of these funnels or "fumaroles" is often so large, and the amount of vapor so abundant, that only now and then, when the wind blows the dense cloud aside, can a momentary glimpse be had of a part of the bottom of the crater; while at the same time the rush and roar of the escaping steam remind one of the din of some vast factory. Aqueous vapor rises likewise from rents on the outside of the volcanic cone. It issues so copiously from some flowing lavas that the stream of rock may be almost concealed from view by the cloud; and it continues to escape from fissures of the lava, far below the point of exit, for a long time after the rock has solidified and come to rest. So saturated are many molten lavas with water-vapor that Mr. Scrope thought that they owed their mobility to this cause.[3] In the deep volcanic magma the water-substance must be far above its critical temperature, which is about 773° Fahr.

Probably in no case is the steam mere pure vapor of water, though when it condenses into copious rain, it is fresh and not salt water. It is associated with other vapors and gases disengaged from the potent chemical laboratory underneath. There seems to be always a definite order in the appearance of these vapors, though it may vary for different volcanoes. The hottest and most active "fumaroles," or vapor-vents, may contain all the gases and vapors of a volcano, but as the heat diminishes, the series of gaseous emanations is reduced. Thus in the Vesuvian eruption of 1855–56, the lava, as it cooled and hardened, gave out successively vapors of hydrochloric acid, chlorides, and

[3] "Considerations on Volcanoes" (1825), p. 110.