fumaroles (pp. 332, 334). Among the exhalations, chlorides abound, particularly chloride of sodium, which appears, not only in fissures, but even over the cooled crust of the lava, in small crystals, in tufts, or as a granular and even glassy incrustation. Chloride of iron is deposited as a yellow coating at fumaroles, where also bright emerald-green films and scales of chloride of copper may be more rarely observed. Many chemical changes take place in the escape of these vapors. Thus specular-iron, either the result of the mutual decomposition of steam and iron-chloride, or of the oxidation of magnetite, forms abundant scales, plates, and small crystals in the fumaroles and vesicles of some lavas. Sal-ammoniac also appears in large quantity on many lavas, not merely in the fissures, but also on the upper surface. In these cases, it is not directly a volcanic product, but results from some decomposition, possibly from the gases evolved by the sudden destruction of vegetation. It has, however, been observed also in the crater of Etna, where the co-operation of organic substance is hardly conceivable, and where perhaps it may arise from the decomposition of aqueous vapor, whereby a combination is formed with atmospheric nitrogen. Sulphur, breislakite, szaboite, tenorite, alum, sulphates of iron, soda and potash, and other minerals are also found.

Slow cooling of lava.—The hardened crust of a lava-stream is a bad conductor of heat. Consequently, the surface of the stream may have become cool enough to be walked upon, though the red-hot mass may be observed through the rents to lie only a few inches below. Many years, therefore, may elapse before the temperature of the whole mass has fallen to that of the surrounding soil. Eleven months after an eruption of Etna, Spallanzani