

That lava may possess an appreciably crystalline structure while still in motion, has often been proved at Vesuvius, where well-defined crystals of the infusible leucite may be observed in a molten magma of the other minerals, portions of the white-hot rock in this condition being ladled out, impressed with a stamp and suddenly congealed. The fluxion-structure above described (pp. 178, 213) furnishes interesting evidence of this fact in many ancient as well as modern lavas.

There is reason to believe that in the molten magma beneath a volcano considerable progress may be made in the development of some crystalline minerals out of the surrounding glass, and that this crystalline portion may be to some extent separated from the vitreous residue. Hence where this has taken place, subsequent eruptions may give rise to a more crystalline and probably more basic lava from one point of emission and a more glassy and probably more acid lava from another vent. Or we may conceive that the two portions of the magma may be subsequently mingled again in various proportions before eruption.⁷⁸ If the process of differentiation should continue, as seems natural, during the lapse of a whole cycle of a volcano's history, the earlier lavas would be more basic than the later.

The crystalline structure of lava has been supposed to be in some measure determined by the presence of the volcanic vapors and gases with which the molten rock is impregnated, the rapid escape of these vapors preventing the formation of the crystalline structure, and leaving the lava in the condition of a more or less perfect glass. But the experiments of

⁷⁸ Compare the observation of Ch. Vélain cited ante, p. 219, and the remarks postea, pp. 444, 457, 936. Consult on this subject a paper by Prof. Judd, *Geol. Mag.* 1888, p. 1.