consists of a glassy magma in which, by reason of the high temperature, most or even all of the mineral constituents exist dissolved. Considerable differences, however, have been observed in the degree of liquidity. Humboldt and Scrope long ago called attention to the thick, short, lumpy forms presented by masses of solidified trachytic rocks, which are lighter and more siliceous, and to the thin, widely extended sheets assumed by basalts, which are heavy and contain much iron and basic silicates.[72] It may be inferred that, as a rule, the basalts or basic lavas have been more liquid than the trachytes or siliceous lavas. The cause of this difference has been variously explained. It may depend partly upon chemical composition, the siliceous being naturally less fusible than the basic rocks. But as great differences of fluidity are observable even among lavas having nearly the same composition, there would seem to be some further cause for the diversity. Reyer has ingeniously maintained that we must look to original differences in the extent to which the subterranean igneous magma that supplied the lava has been saturated with vapors and gases. Molten rock highly impregnated gives rise, he holds, to fragmentary discharges, while when feebly impregnated it flows out tranquilly.[73] On the other hand, Captain C. E. Dutton, who has studied the volcanic phenomena of Western America and Hawaii, suggests that the different degrees of liquidity may depend not only on chemical differences, but on variations of temperature. He supposes that the basaltic lavas which have spread so far in thin sheets, and which must have had a comparatively great liquidity, flowed at temperatures far

[72] Scrope, "Considerations on Volcanoes" (1825), p. 93.
[73] "Beitrag zur Physik der Eruptionen," p 77.