

in very variable amount according to temperature.<sup>3</sup> It is this vapor which chiefly absorbs radiant heat.<sup>4</sup> It condenses into dew, rain, hail, and snow. In assuming a visible form, and descending through the atmosphere, it takes up a minute quantity of air, and of the different substances which the air may contain. Being caught by the rain, and held in solution or suspension, these substances can be best examined by analyzing rain-water. In this way, the atmospheric gases, ammonia, nitric, sulphurous, and sulphuric acids, chlorides, various salts, solid carbon, inorganic dust, and organic matter have been detected. The fine microscopic dust so abundant in the air is no doubt for the most part due to the action of wind in lifting up the finer particles of disintegrated rock on the surface of the land. Volcanic explosions sometimes supply prodigious quantities of fine dust. There is probably also some addition to the solid particles in the atmosphere from the explosion and dissipation of meteorites on entering our atmosphere. To the wide diffusion of minute solid particles in the air great importance in the condensation of vapor has recently been assigned. (Book III. Part II. Section ii.)

The comparatively small, but by no means unimportant, proportions of these minor components of the atmosphere are much more liable to variation than those of the more essential gases. Chloride of sodium, for instance, is, as might be expected, particularly abundant in the air bordering the sea. Nitric acid, ammonia, and sulphuric acid

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<sup>3</sup> A cubic metre of air at the freezing-point can hold only 4.871 grammes of water-vapor, but at 40° C. can take up 50.70 grammes. One cubic mile of air saturated with vapor at 35° C. will, if cooled to 0°, deposit upward of 140,000 tons of water as rain. Roscoe and Schorlemmer's "Chemistry," i. p. 452.

<sup>4</sup> See Tyndall's researches which established this important function of the aqueous vapor of the atmosphere, and their confirmation by meteorological observation. S. A. Hill, Proc. Roy. Soc. xxxiii. 216, 435.