

As now existing, the atmosphere is considered to be normally a mechanical mixture of nearly 4 volumes of nitrogen and 1 of oxygen (N79·4, O20·6), with minute proportions of carbon-dioxide and water-vapor and still smaller quantities of ammonia and the powerful oxidizing agent, ozone. These quantities are liable to some variation according to locality. The mean proportion of carbon-dioxide is about 3·5 parts in every 10,000 of air. In the air of streets and houses the proportion of oxygen diminishes, while that of carbon-dioxide increases. According to the researches of Angus Smith, very pure air should contain not less than 20·99 per cent of oxygen, with 0·030 of carbon-dioxide; but he found impure air in Manchester to have only 20·21 of oxygen, while the proportion of carbon-dioxide in that city during fog was ascertained to rise sometimes to 0·0679, and in the pit of the theatre to the very large amount of 0·2734. As plants absorb carbon-dioxide during the day and give it off at night, the quantity of this gas in the atmosphere oscillates between a maximum at night and a minimum during the day. During the part of the year when vegetation is active, it is believed that there is at least 10 per cent more carbonic acid in the air of the open country at night than in the day.<sup>2</sup> Small as the normal percentage of this gas in the air may seem, yet the total amount of it in the whole atmosphere probably exceeds what would be disengaged if all the vegetable and animal matter on the earth's surface were burned.

The other substances in the air are gases, vapors, and solid particles. Of these by much the most important is the vapor of water, which is always present, but

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<sup>2</sup> Prof. G. F. Armstrong. Proc. Roy. Soc. xxx. (1880), p. 343.