

therefore; in this form, inconsistent with Dalton's principle; but it is not difficult to modify the expression so as to retain the essential part of the explanation.

Dew.—The principle of a "constituent temperature" of steam, and the explanation of the "dew-point," were known, as we have said (chap. iii. sect. 3,) to the meteorologists of the last century; but we perceive how incomplete their knowledge was, by the very gradual manner in which the consequences of this principle were traced out. We have already noticed, as one of the books which most drew attention to the true doctrine, in this country at least, Dr. Wells's *Essay on Dew*, published in 1814. In this work the author gives an account of the progress of his opinions;²² "I was led," he says, "in the autumn of 1784, by the event of a rude experiment, to think it probable that the formation of dew is attended with the production of cold." This was confirmed by the experiments of others. But some years after, "upon considering the subject more closely, I began to suspect that Mr. Wilson, Mr. Six, and myself, had all committed an error in regarding the cold which accompanies the dew, as an *effect* of the formation of the dew." He now considered it rather as the *cause*: and soon found that he was able to account for the circumstances of this formation, many of them curious and paradoxical, by supposing the bodies on which dew is deposited, to be cooled down, by radiation into the clear night-sky, to the proper temperature. The same principle will obviously explain the formation of mists over streams and lakes when the air is cooler than the water; which was put forward by Davy, even in 1819, as a new doctrine, or at least not familiar.

Hygrometers.—According as air has more or less of vapor in comparison with that which its temperature and pressure enable it to contain, it is more or less humid; and an instrument which measures the degrees of such a gradation is a *hygrometer*. The hygrometers which were at first invented, were those which measured the moisture by its effect in producing expansion or contraction in certain organic substances; thus De Saussure devised a hair-hygrometer, De Luc a whalebone-hygrometer, and Dalton used a piece of whipcord. All these contrivances were variable in the amount of their indications under the same circumstances; and, moreover, it was not easy to know the physical meaning of the degree indicated. The dew-point, or constituent temperature of the vapor which exists in the air, is, on

²² *Essay on Dew*, p. 1.