system, excepting the diameter of the earth and the distance and diameter of the moon, may be corrected (*e*).

The light and heat which are emitted from the sun reach the earth without great diminution by the absorptive action of the atmosphere; but the waste of heat from the surface of our planet through radiation into space is prevented, or rather lessened, by this same atmosphere. Many transparent bodies admit freely heat-rays derived from a source of high temperature, but stop the rays which emanate from bodies only slightly warmed. The atmosphere possesses this quality in a remarkable degree, and owes it to the presence of diffused water and vapor; a fact which Dr. Tyndall has placed in the clear light of complete and varied experiment (*f*). The application of this truth to the history of the earth and of the other planets is obvious. The vaporous atmosphere acts like warm clothing to the earth. By an augmented quantity of vapor dissolved, and water suspended in the air, the waste of surface-heat of the earth would be more impeded; the soil, the water, and the lower parts of the atmosphere would grow warmer; the climates would be more equalized; the general conditions more like what has been supposed to be the state of land, sea, and air during the geological period of the Coal-measures.

Such an augmentation of the watery constituents in the atmosphere would be a natural consequence of that greater flow of heat from the interior, which, by many geologists, mathematicians, and chemists, is supposed to have happened in the earlier periods of the history of the earth.

By the same considerations we may understand how the planet Mars, which receives not half so much heat from the sun (*g*) as

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(*e*) Estimates of the earth's distance from the sun have varied much. Cassini and Flamsteed, using observations of the parallax of Mars, ascribe to it ten or eleven thousand diameters of the earth=79 or 89 millions of miles. Huyghens estimated it at twelve thousand=95 millions of miles. In 1745, Buffon reported it as the common opinion of astronomers at 30 millions of leagues (Fr.)=90 millions miles (Engl); but after the transit of Venus in 1769, he allowed 33 millions. Such was the effect of that now supposed erroneous experiment on the opinions of astronomers. (Epoques de la Nature.)

(*f*) Proc. of Roy. Soc. 1861. The Rumford Medal was adjudged to Dr. Tyndall in 1864.

(*g*) The proportion is about $\frac{1}{2\frac{6}{7}\frac{9}{1}}$ according to the received measure of the mean distance.