been said, it is plain that the principal causes which influence the earth's surface temperature are known. One of the circumstances which mask the regularity of the results, and their real dependence on the position of the sun, is the delay which occurs between the moment of exertion of the greatest heating and cooling power, and its visible effect on the surface of the land and sea. In the influence of the moon on the tide, we have an instance of the same kind lately reduced to law: the highest tides take place after the moon has passed her point of power. Just so the warmest epoch of the day is. after the sun has crossed the meridian, when most rays fall on the earth : the hottest and coldest epochs of the year follow by an interval of about three weeks (in northern latitudes) the summer and winter solstices. When these allowances of time are made, and the local circumstances previously adverted to allowed for, the coincidence of calculation for hourly, daily, monthly, and annual temperatures, with the result of long continued and regular observation, is surprisingly close, and fully justifies the general conclusion that the earth's surface temperature is the balance of the variable heating energy of the sun and the uniform cooling power of the ethereal spaces in which the earth's orbit is situated. (What effect on surface temperature the peculiar condition of the interior of the earth may occasion, will be seen hereafter.) This being established, we may appeal to observation for proof that it is at the surface of the earth the greatest variations of temperature take place, and from this surface they are propagated upwards with diminishing force into the air above, and into the water and earth below, till in each direction they terminate, or become insensible. The communication of solar heat into the earth constitutes the first branch of our inquiry, and it has been quite sufficiently prosecuted to authorise the following positive statements.

1. By Leslie's experiments, made in 1816, 1817, at Abbotshall, in Fife, with *long thermometers*, plunged in

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