THE ORBITAL PATH OF THE EARTH.

The maximum depression of the earth's equaof winter. torial plane below the ecliptic has been now attained and the earth commences again to ascend; on the completion of the third quadrant the centres of the earth and the sun are again in the same horizontal plane, and the autumnal equinox has been arrived at. The ascent of the earth still continuing, the plane of the ecliptic is again passed and when the orbital revolution has been completed and the earth has again arrived at the plane first considered (viz, the winter solstice) the maximum elevation has been attained of 37,255,000 miles above the plane of the ecliptic. To avoid unnecessary complication we have here considered the earth's orbit of revolution as a circle. When we take also into consideration the ellipticity of the orbit, the probability at once suggests itself that the elevation and depression of the earth at various parts of the orbit will be proportional (or very nearly so) to the horizontal distance of the earth from the sun; that is to say, the amount of maximum elevation for the one semiorbit and the amount of maximum depression for the other semi-orbit will be proportional to the comparative lengths of the horizontal radius-vector measured at each extremity of the major diameter of the ellipse respectively; because the extent of the vertical vibration is evidently dependent upon the horizontal distance from the sun; and, moreover, the vertical vibration (or oscillation) being of precisely the same nature as the horizontal vibration to which the ellipticity of the orbit is correctly attributable, it appears to be at least probable that the same impulse, whether imparted in the first instance or derived from some perturbing influence subsequently, which caused the one, will have also caused the other; and hence that the arcs of vibration, or the spaces through which the oscillating motions extend, in the two directions, viz. the vertical and the horizontal, will be proportional to each other. A correction will therefore have to be made

15