

a point determined by drawing $b.F'$, to touch the body of the planet, the *emersions* will cease to be visible, and will thenceforth, up to the time of the opposition, happen *behind* the disc of the planet. Similarly, from the opposition till the time when the earth arrives at I , a point determined by drawing $a. I$, tangent to the eastern limb of Jupiter, the *emersions* will be concealed from our view. When the earth arrives at G , [or H] the immersion [or emersion] will happen at the very edge of the visible disc, and when between G , and H [a very small space] the satellites will *pass uneclipsed behind the limb* of the planet."

(540) "Both the satellites and their shadows are frequently observed to *transit* or pass across the disc of the planet. When a satellite comes to u , its shadow will be thrown on Jupiter, and will appear to move across it as a black spot till the satellite comes to v . But the satellite itself will not appear to enter on the disc till it comes up to the line drawn from E , to the eastern edge of the disc, and will not leave it till it attains a similar line drawn to the western edge. It appears then that the shadow will *precede* the satellite in its progress over the disc *before* the opposition of Jupiter, and *vice versa*."

(541) "Besides the eclipses and the transits of the satellites across the disc, they may also disappear to us when not eclipsed, by passing behind the body of the planet. Thus, when the earth is at E , the immersion of the satellite will be seen at a , and its emersion at b , both to the west of the planet, after which the satellite, still continuing its course in the direction b , will pass behind the body and again emerge on the opposite side, after an interval of occultation greater or less according to the distance of the satellite. This interval, (on account of the great distance of the earth compared with the radii of the orbits of the satellites,) varies but little in the case of each satellite, being nearly equal to the time which the satellite requires to describe an arc of its orbit, equal to the angular diameter of Jupiter as seen from its centre,