

## THE SATELLITES OF JUPITER.

Even so early as the brilliant epoch of Galileo, the correct opinion was formed that the *subordinate planetary system* of Jupiter might present, in many relations of space and time, a picture in miniature of the Solar System. This view, rapidly diffused at that time, as well as the discovery, shortly afterward, of the phases of Venus (February, 1610), contributed greatly to the general introduction of the Copernican system. The quadruple group of satellites of Jupiter is the only one of the exterior principal planets which has not been increased by any new discovery, during a period of nearly two centuries and a half, since the epoch of their first discovery by Simon Marius on the 29th of December, 1609.

The following table contains the *periods of sidereal revolution* of the satellites of Jupiter, their *mean distances* expressed in diameters of the primary, their *diameters* in geographical miles, and their *masses* as parts of the mass of Jupiter.

Satellites.	Period of Revolution.			Distance from Jupiter.	Diameter in Geogr. Miles.	Mass.
	d.	h.	m.			
1	1	18	28	6,049	2116	0·0000173281
2	3	13	14	9,623	1900	0·0000232355
3	7	3	14	15,350	3104	0·0000884972
4	16	16	32	26,998	2656	0·0000426591

If  $\frac{1}{1047879}$  expresses the mass of Jupiter with his satellites, then his mass without the satellites is  $\frac{1}{1048059}$ , only about  $\frac{1}{6000}$  smaller.

The comparisons of the *magnitudes*, *distances*, and *eccentricities* with other satellite systems has already been given (*Cosmos*, vol. iv., p. 105–127). The *luminous intensity* of Jupiter's satellites is various, and not in proportion to their volume, since, as a general rule, the *third* and the *first*, whose relation of magnitude is as 8 : 5, appear the brightest. The smallest and densest of all—the *second*—is generally brighter than the larger *fourth*, which is ordinarily called the *least luminous*. Accidental (temporary) fluctuations in the luminous intensity have, as already remarked, been ascribed sometimes to changes of the surface, sometimes to obscurations in the atmosphere of the satellites.\* They all appear, moreover, to reflect a more intense light than the primary. When the Earth is situated between Jupiter and the Sun, and the satellites, therefore, moving from east to

\* Sir John Herschel, *Outlines*, § 540.