

ets, its constitution, and height. I will merely call to mind here the conjecture of Sir John Herschel, as to the temperature of the Moon's surface, "which must necessarily be very much heated—*possibly* to a degree much exceeding that of boiling water."\*

#### b. SECONDARY PLANETS.

The *general comparative considerations* relating to the secondary planets have already been given with some completeness in the *delineations of nature* (*Cosmos*, vol. i., p. 94–98). At that time (March, 1845) there were only 11 principal and 18 secondary planets known. Of the asteroids so called *telescopic*, or small planets, only four were discovered: Ceres, Pallas, Juno, and Vesta. At the present time (August, 1851), the number of the *principal planets* exceeds that of the *satellites*. We are acquainted with 22 of the former and 21 of the latter. After an intermission of thirty-eight years in planetary discoveries (from 1807, to December, 1845), commenced a long series of ten new small planets, with Astrea, discovered by Hencke. Of these, two (Astrea and Hebe) were first detected by Hencke at Driesen, four (Iris, Flora, Victoria, and Irene) by Hind in London, one (Metis) by Graham at Markree Castle, and three (Hygeia, Parthenope, and Egeria) by De Gasparis at Naples. The discovery of the outermost of all the large planets, Neptune, announced by Leverrier, and found by Galle at Berlin, followed ten months after Astrea. The discoveries now accumulate with such rapidity, that the topography of the solar regions appears, after the lapse of a few years, quite as antiquated as statistical descriptions of countries.

Of the 21 satellites now known, one belongs to the Earth, four to Jupiter, eight to Saturn (the last discovered of these eight is, according to distance, the seventh, Hyperion; discovered in two different places at the same time by Bond and Lassell), six to Uranus (of which the second and fourth are most positively determined), and two to Neptune.

The satellites revolving round the principal planets constitute *subordinate systems*, in which the principal planets take the place of central bodies, forming individual regions of very different dimensions, in which the great solar region is, as it were, repeated in miniature. According to our present knowledge, the region of Jupiter is 208,000 geographical miles in diameter, and that of Saturn 4,200,000. In Galileo's

\* *Outlines*, § 432.