

THE SMALL PLANETS.

We have already, in the general consideration* of the planetary bodies, characterized the group of *small planets* (*asteroids, planetoids, co-planets, telescopic or ultra-zodiacal planets*) under the name of an *intermediate group*, which, to a certain extent, forms a zone of *separation* between the four *interior planets* (Mercury, Venus, the Earth, and Mars), and the four *exterior planets* of our solar system (Jupiter, Saturn, Uranus, and Neptune). Their most distinctive features consist in their interlaced, greatly inclined, and extremely eccentric orbits; their extraordinary smallness, as the diameter of Vesta does not appear to equal even the fourth part of the diameter of Mercury. When the first volume of the *Cosmos* appeared (1845), only four of the small planets were known: Ceres, Pallas, Juno, and Vesta, discovered by Piazzi, Olbers, and Harding (between January 1, 1801, and March 29, 1807); at the present time (July, 1851), the number of the small planets has already increased to 14; they form numerically

* *Cosmos*, vol. iv., p. 101. With regard to the chronology of the discoveries of the small planets, compare p. 100 and 131; their relations of magnitude to the meteor-asteroids (aërolites), p. 105. With respect to Kepler's conjecture of the existence of a planet in the great chasm between Mars and Jupiter—a conjecture, however, which by no means led to the discovery of the first of the small planets (*Ceres*), compare p. 111, 116, and 117, note †. The bitter reproach which has been thrown upon a highly esteemed philosopher, “because at a time when he might have known of Piazzi's discovery certainly five months before, but was unacquainted with it, he denied not so much the probability, as much more the necessity of a planet being situated between Mars and Jupiter,” appears to me to be little justifiable. Hegel, in his *Dissertatio de Orbitis Planetarum*, composed in the spring and summer of 1801, treats of the ideas of the ancients of the distances of the planets; and when he quotes the arrangement of which Plato speaks in the *Timæus* (p. 35, Steph.), 1 . 2 . 3 . 4 . 9 . 8 . 27 (compare *Cosmos*, vol. iv., p. 109, note †), he denies the necessity of a chasm. He says only, “Quæ series *si verior naturæ ordo sit*, quam arithmetica progressio, inter quartum et quintum locum magnum esse spatium, neque ibi planetam desiderari apparet.” “If the order of nature is more precise than an arithmetical progression, there appears to be a great space between the fourth and fifth place, and that no planet is required there.” (Hegel's *Werke*, bd. xvi., 1834, p. 28; and Hegel's *Leben von Rosenkranz*, 1844, p. 154.) Kant, in his ingenious work, *Naturgeschichte des Himmels*, 1755, says merely that at the time of the formation of the planets, Jupiter occasioned the *smallness* of Mars by the enormous attractive force which the former possessed. He only once mentions, and then in a very indecisive manner, “the members of the solar system which are situated far from each other, and between which the intermediate parts have not yet been discovered.” Immanuel Kant, *Sämmtliche Werke*, th. vi., 1839 p. 87, 110, and 196.)