

employed in searching the sky for it in vain. At last, after many trials, Von Zach and Olbers again found it, the one on the last day of 1801, the other on the first day of 1802. Gauss and Burckhardt immediately used the new observations in determining the elements of the orbit; and the former invented a new method for the purpose. Ceres now moves in a path of which the course and inequalities are known, and can no more escape the scrutiny of astronomers.

The second year of the nineteenth century also produced its planet. This was discovered by Dr. Olbers, a physician of Bremen, while he was searching for Ceres among the stars of the constellation Virgo. He found a star which had a perceptible motion even in the space of two hours. It was soon announced as a new planet, and received from its discoverer the name of Pallas. As in the case of Ceres, Burckhardt and Gauss employed themselves in calculating its orbit. But some peculiar difficulties here occurred. Its eccentricity is greater than that of any of the old planets, and the inclination of its orbit to the ecliptic is not less than thirty-five degrees. These circumstances both made its perturbations large, and rendered them difficult to calculate. Burckhardt employed the known processes of analysis, but they were found insufficient: and the Imperial Institute (as the French Academy was termed during the reign of Napoleon) proposed the Perturbations of Pallas as a prize-question.

To these discoveries succeeded others of the same kind. The German astronomers agreed to examine the whole of the zone in which Ceres and Pallas move; in the hope of finding other planets, fragments, as Olbers conceived they might possibly be, of one original mass. In the course of this research, Mr. Harding of Lilienthal, on the first of September, 1804, found a new star, which he soon was led to consider as a planet. Gauss and Burckhardt also calculated the elements of this orbit, and the planet was named Juno.

After this discovery, Olbers sought the sky for additional fragments of his planet with extraordinary perseverance. He conceived that one of two opposite constellations, the Virgin or the Whale, was the place where its separation must have taken place; and where, therefore, all the orbits of all the portions must pass. He resolved to survey, three times a year, all the small stars in these two regions. This undertaking, so curious in its nature, was successful. The 29th of March, 1807, he discovered Vesta, which was soon found to be a planet. And to show the manner in which Olbers pursued his labors, we may state that he afterwards published a notification that he had examined the