

a fact of which neither Kant nor Laplace had been aware. Uniformity in the rotation of all the bodies in the solar system is the fundamental conception in the theory of Laplace; yet this conception was directly contradicted by the discovery that the satellites of the two planets farthest from the sun rotated in a direction opposite to the direction of rotation of all other known bodies in the solar system. Other weak points in the theory of Laplace rendered it open to criticism. Kant had supposed that the atoms of primitive matter originally possessed the property of mutual attraction and repulsion, and a whirling motion, and that they gradually attained a uniform rotatory movement, while Laplace, on the other hand, had assumed the rotatory movement as inherent in matter; but neither Kant nor Laplace had tried to offer a satisfactory explanation of the phenomena of rotation. Moreover, these physicists had not attempted to explain the incandescent state of certain celestial bodies; Laplace had merely assumed that matter was provided with an indefinite supply of heat, without offering any scientific hypothesis for the origin of heat. Again, a further contradiction was presented to the theory of Kant and Laplace by the approach of comets from regions of considerable space beyond the solar system.

Several attempts were made to replace the theory of Kant and Laplace by a more satisfactory one. One of these was Mädler's hypothesis in 1846, which postulated a common centre for the whole universe of fixed stars, but not a central sun whose superiority of mass controlled the movements of other bodies. The movement of fixed stars was said to be under the direction of an ideal centre of gravity. This assumption contradicted the idea of the successive formation of rings and the separation of masses of matter from a central body. According to Mädler, the ring-theory of Laplace could not possibly be held to apply to the numerous double stars.

The French astronomer, Faye, brings forward some remarkable conceptions in his recent work, *Sur l'Origine du Monde*, published in 1896. Faye does not accept the existence of a central mass either in the case of the heaven of fixed stars, or in our solar system. He supposes that originally a part of the universal matter had a slow, whirling movement, and that neighbouring masses of matter developed a movement in a similar direction as a consequence of the action of gravitation and mutual attraction. Thus the myriad of heavenly