terior, consequently when the breaking up of this ring would occur its impulsion into a sphere must be from the interior of the ring to the exterior, and the planet thus formed would be retrograde, all the planets and their satellites, then, should have a retrograde motion

have a retrograde motion. Laplace's theory is based upon a false and has been most principle. phatically contradicted by facts made known only after it had been adduced. At length, in 1885, Faye, a celebrated French scientist, formulated a new theory for the formation of the solar system, he adopted Descartes' hypothesis observaconcerning whirlwinds, and tions made at the present day bear him out in this, for, even after so long a lapse of centuries, there can be seen many striking examples of whirlwind movements in the heavens, that prove the correctness of his contention, such as the nebula of the Virgin, consisting of a series of spires diverging from a common centre, the nebulas of Pegasus and the Lion, in which the separation of the matter into rings is most apparent, and the nebula of Lyra where the separation of the spires of the whirlwind has become regular and trans-Taking formed into concentric rings. into consideration the solar system, we must explain how a whirlwind movement, more or less confused, would at length become regular and uniform, so as to give birth to the different planets and their satellites. If we suppose that the primitive nebulous mass, which God in His infinite wisdom had created and placed in space, was not subjected to any exterior force, was homogeneous throughout, and had the spherical form, this will not be a difficult task, for mechanics teaches us, that in such a body, the attraction of its molecules towards the centre varies in direct ratio to its distance from the centre, and that the particles composing this body of great rarity necessarily describe ellipses circles round the centre in the same time, whatever may be their distance from it. The existence of a system of rings revolving as one whole, and with the same angular velocity, is the inevitable result of these laws.

The primitive chaos is now changed into a vast assemblage of rings turning in the same direction around the centre of gravity. In each of these the velocity of the molecules increases

from the interior to the exterior, this difference in speed causes a whirlwind; for we know that in the atmosphere, the least difference in velocity between the different strata, gives rise to a whirlwind; so, in the rings that have been produced whirlwinds occur, but as the molecules of the outer portion of each ring are in advance of those of the inner portion, the rotation of the whirlwind must be from the exterior to the interior, that is, in the direction of The most violent of the generating ring. these will attract to itself some of the matter of the ring and will at length form a spherical mass. Around these chaotic masses other rings collect and will in turn be converted into spheres, thus giving birth to the various satellites that attend the planets. But all the matter of the rings will not be englobed in these bodies, in fact, the greater amount of it will describe ellipses in falling towards the centre of gravity, and will gradually form a central mass the germ of the sun which is to come in the future.

Laplace left many points in obscurity; he treated the comets as an accident in the solar system, and declared that he could not account for their exist-Faye, on the contrary, offers a very ingenious explanation for these phenomena; he maintains that it is but natural to expect that there should remain some matter that would not be taken up in the formation of the sun and the planets; this matter would continue to move in As this matter has elongated ellipses. not been enrolled into the primary spheres, the bodies formed from it should move in every direction so as to reduce to zero the effect produced by all upon the whole solar system. Here again is Faye's theory borne out by observation, for the comets execute their movements in every If we were not imaginable direction. aware of the existence of either Uranus or Neptune, and their satellites, we would be led to different conclusions. With Newton we could assert that the regular movement of the planets and their moons could not be accounted for by any law of mechanics, for, whilst all these relate and revolve in the same direction around the sun, the comets do not possess such a similarity of movement, and any law would have compelled them to move in the same direction; or with Laplace, we could treat the comets as an exception in