

still in existence. We readily admit that any hypothesis, which does not reach every case, which does not afford a plausible explanation of all the various phenomena observed in nature, is not worthy of further retention whilst another, within whose embrace a wider field of accounted-for facts is contained, may be, and is, in reality, invented; still, our adversaries must, likewise, acknowledge the impropriety of instituting a novel supposition, as long as an older one proves wholly satisfactory. True, indeed, the fact that the moons of Uranus and Neptune describe their orbits in a direction contrary to that in which the satellites of the other planets move would undoubtedly be a serious drawback to the followers of Laplace, could there no explanation of this extraordinary occurrence, even in accordance with his system, be given. And at first sight the difficulty seems insurmountable. Upon duly reflecting, however, on the great age of the planets in question, and observing the inclination of the earth's axis to that of the sun, the danger threatening Laplace's theory vanishes, the impending calamity is warded off, and the retrogression of the most ancient members of the solar system, which at first rose like an immense barrier to the Nebular Hypothesis, suddenly becomes only another guide-post for those who would follow its course with safety.

We are all well aware that the axis of our own planet is inclined to that of the sun. Moreover, astronomers agree that this inclination is yearly increasing slowly in truth, but, nevertheless, unmistakably. Can it not justly be supposed, then, that at one time these two lines—that joining the poles of the earth and that passing through those of the great central orb—were parallel; that the earth's axis has become inclined to the sun's by a slow but constant movement, and will eventually become more and more inclined until where the North Pole now is, the South Pole will be? If the orbit of the moon should still continue to hold the same relative position which it now maintains with regard to the earth, a moment's attention will suffice to convince anyone that, to a person standing on any of the other planets, our earth and its satellite would appear to have a retrograde motion—that is a direction opposite to that in which it moved before the North and South Poles exchanged positions.

This apparent retrogression of a sphere owing to an inversion of its axis, may be more clearly seen, if a pane of glass be taken, and on one side a globe with one or more moons revolving around it, be traced. Let arrows indicate the direction in which the different bodies move. Now, since the arrows are painted upon the glass, they must necessarily indicate, absolutely speaking, a motion always in the same direction. If, now, the pane of glass is inverted, it will be seen that the arrows indicate a motion in an opposite direction. This, however, would be only a relative retrograde motion; for the arrows would still point in the same absolute direction.

Is it not, then, quite compatible with the theory of Laplace to suppose that the planets Uranus and Neptune, together with their moons, rotated at one time in a direction similar to that in which the other planets now move? If our earth's axis is becoming more and more inclined to that of the sun, and has already attained no small degree of inclination, although its period of existence is a much shorter one than that attributable to such ancient orbs as that of Uranus and Neptune, why should not these latter have undergone a like change of position, and owing to their greater age have reached a far higher point of inclination than the earth, so that the axis of Uranus, as is indeed the case, should be inclined at an angle of 90° , while the axis of its older neighbor, Neptune—as is likewise borne out by observation—should be totally inverted?

Such an occurrence would, undoubtedly, give an apparent retrograde motion to these planets and their satellites, although absolutely the motion originally imparted to them had never once been altered.

If, as the writer who treated of Mr. Faye's theory suggested, the cause of this retrogression must be sought in the mode in which these planets rolled up from huge rings to form spheres; if the reason must be found in the fact that the particles at the interior of the ring were in advance of those at its exterior, and consequently when the ring broke, rolled up so that the exterior of the ring became the interior of the resultant sphere; why then should not the same happen in regard to Saturn, Jupiter and the other planets? To afford any explanation at all, and to avoid exceptions, the only way in which the retrograde motion can be