

experiment by which the dispute might be settled. Accordingly both parties agreed that on a given day two balls such as those described should be dropped from the leaning tower of Pisa. Crowds repair to the spot, the balls are carefully examined and weighed; they drop at the same moment, and descending, they both at the same moment strike the earth. The experiment is repeated again and again with precisely the same result. His enemies instead of candidly acknowledging their error, became exasperated at his triumph, and he is at last driven from the town of which he was the most distinguished ornament.

But do the planets act upon each other in proportion to their distances and masses? They do constantly. How then, it may well be asked, can the stability of the system be preserved? Will not the perturbations so occasioned however minute ultimately lead to its absolute destruction? Well may the question be put. Nothing short of infinite skill was necessary to ensure permanent stability. Assuming that all the most celebrated astronomers who ever lived, with all the present advanced knowledge of the forces at work in the solar system at their command, had been employed to construct it, and had brought all their skill to bear on the sublime undertaking, having the planets made to their hand, and being endowed with the power to poise them, to fix their positions in space, and give them their original impulse, they would fail to secure stability. Let us endeavor to convey a faint idea of the complications involved in these perturbations. Let us imagine all the planets placed in a line occupying their present relative positions, and poised as they now are. The Almighty gives them their impulse, and they at their nearest points to the Sun rush into space. No sooner have they been launched into the illimitable void than the Sun seizes them, and draws them into the beautiful curve which they now describe. They will complete their revolutions round the Sun and centre in different periods. Mercury, assuming that there is no other planet near the Sun, will be the first to complete a revolution, performing the journey in 87 days, Venus comes next to the starting point in 224 days, the

earth follows in 365 days, Mars comes next in 686, followed by Jupiter in 11 of our years. Saturn with his wonderful rings and moons succeeds Jupiter in 29 of our years. Uranus completes his orbit in 84 years, and Neptune brings up the rear in 164 years from the memorable day on which the planets started. Now the question occurs will each planet occupy on its return to its perihelion or nearest point to the Sun the precise spot which it at first occupied. No. In the case of all the planets it is in *advance* of the starting point, and this progression of the perihelion continues so that it makes circuit after circuit of the Sun without ever ceasing. How long then does the perihelion of the earth's orbit take to come back to the precise point which it first filled when all the planets first started? *One hundred and eleven thousand years!* That of the orbit of Jupiter takes 186,207, and that of Mercury 200,000 years to make a complete circuit. Then the relations of the various orbits to each other are in a state of constant mutation, and the forms of the orbits are ever changing. That of the earth is becoming more circular, and in about half a million of years it will become an exact circle! But no sooner does it become so than it begins again to assume an elliptical form. Thus every deviation from the order and position which the planets occupied when they received their first impulse has a prescribed limit beyond which it cannot go, and the stability of the system is thus secured. Will the time ever come, it may be asked, when all the planets will again come in line, and occupy the very same position in space in relation to the Sun as when they were first bowled into space by the Almighty? Yes, but millions of years must elapse before that can occur.

Many of our readers must have read Dr. Paley's book on Natural Theology, and will remember that his main object is to prove the existence of an intelligent Creator from the proofs of design visible in His works. He has a chapter on astronomy—the facts adduced having been supplied, if our memory does not fail us, by a professor of the science resident in Dublin. The chapter in question is the least masterly in the whole book, and the learned author ex-