

Mercury in the proportion of two to three. The last mentioned case is a considerable deviation, and two of the small planets which lie between Mars and Jupiter, namely Juno and Pallas, exhibit an inequality somewhat greater still; but the smallness of these bodies, and other circumstances, make it probable that there may be particular causes for the exception in their case. The orbits of the satellites of the Earth, of Jupiter and of Saturn, are also nearly circular.

Taking the solar system altogether, the regularity of its structure is very remarkable. The diagram which represents the orbits of the planets might have consisted of a number of ovals, narrow and wide in all degrees, intersecting and interfering with each other in all directions. The diagram does consist, as all who have opened a book of astronomy know, of a set of figures which appear at first sight concentric circles, and which are very nearly so; nowhere approaching to any crossing or interfering, except in the case of the small planets, already noticed as irregular. No one, looking at this common diagram, can believe that the orbits were made to be so nearly circles by chance; any more than he can believe that a target, such as archers are accustomed to shoot at, was painted in concentric circles by the accidental dashes of a brush in the hands of a blind man.

The regularity, then, of the solar system excludes the notion of accident in the arrangement of the orbits of the planets. There must have been an express adjustment to produce this circular character of the orbits. The velocity and direction of the motion of each planet must have been subject to some original regulation; or, as it is often expressed, the projectile force must have been accommodated to the centripetal force. This once done, the motion of each planet, taken by itself, would go on for ever, still retaining its circular character, by the laws of motion.