

known conditions, although man considers as *accidental* whatever he is unable to explain in the planetary formation on purely genetic principles. If the planets have been formed out of separate rings of vaporous matter revolving round the Sun, we may conjecture that the different thickness, unequal density, temperature, and electro-magnetic tension of these rings may have given occasion to the most various agglomerations of matter, in the same manner as the amount of tangential velocity and small variations in its direction have produced so great a difference in the forms and inclinations of the elliptic orbits. Attractions of mass and laws of gravitation have no doubt exercised an influence here, no less than in the geognostic relations of the elevations of continents; but we are unable from present forms to draw any conclusions regarding the series of conditions through which they have passed. Even the so-called law of the distances of the planets from the Sun, the law of progression (which led Kepler to conjecture the existence of a planet supplying the link that was wanting in the chain of connection between Mars and Jupiter), has been found numerically inexact for the distances between Mercury, Venus, and the Earth, and at variance with the conception of a series, owing to the necessity for a supposition in the case of the first member.

The hitherto discovered principal planets that revolve round our Sun are attended certainly by fourteen, and probably by eighteen secondary planets (moons or satellites). The principal planets are, therefore, themselves the central bodies of subordinate systems. We seem to recognize in the fabric of the universe the same process of arrangement so frequently exhibited in the development of organic life, where we find in the manifold combinations of groups of plants or animals the same typical form repeated in the *subordinate classes*. The secondary planets or satellites are more frequent in the external region of the planetary system, lying beyond the intersecting orbits of the smaller planets or asteroids; in the inner region none of the planets are attended by satellites, with the exception of the Earth, whose moon is relatively of great magnitude, since its diameter is equal to a fourth of that of the Earth, while the diameter of the largest of all known secondary planets—the sixth satellite of Saturn—is probably about one seventeenth, and the largest of Jupiter's moons, the third, only about one twenty-sixth part that of the primary planet or central body. The planets which are attended by the largest number of satellites are most remote from the Sun,