

*motion*, remained in all its branches amenable to mathematical treatment. This advantage gives to the elementary works on *theoretical* astronomy a great and entirely peculiar charm. In them is reflected what the intellectual labors of later centuries have achieved by the analytical methods; how configuration and orbits are determined; how, in the phenomena of planetary motion, only small oscillations about a *mean* condition of equilibrium can take place; how the planetary system, from its *internal* arrangement, works its preservation and permanence by the *compensation* of *perturbations*.

The examination of the *means* of forming a general conception of the universe, the *explanation* of the complicated celestial phenomena, do not belong to the plan of this work. The physical description of the universe relates to what fills space, and organically animates it, in both spheres of uranological and telluric relations. It adheres to the consideration of the discovered laws of nature, and treats of them as acquired facts, as immediate results of empirical induction. In order to carry out the work of the *Cosmos* within the appropriate limits, and not with too great extension, it must not be attempted to establish theoretically the connection of phenomena. In this limitation of the plan laid down beforehand, I have, in the astronomical volume of *Cosmos*, applied so much the more care to the individual facts and their arrangement. From the consideration of universal space, its temperature, the degree of its transparency, and the resisting medium which fills it, I have passed on to natural and telescopic vision, the limits of visibility, the velocity of light, according to the difference of its sources, the imperfect measurements of luminous intensity, and the new optical means of distinguishing direct from reflected light. Then follows the heaven of fixed stars; the numerical statement of its self-luminous suns so far as their position is determined; their probable distribution; the changeable stars which reappear at well-defined periods; the proper motion of the fixed stars; the assumption of the existence of dark cosmical bodies, and their influence upon the motion of the binary stars; the nebulous spots, in so far as these are not remote and very dense swarms of stars.

The transition from the sidereal part of uranology—from the heaven of the fixed stars to our solar system, is merely a transition from the universal to the particular. In the class of binary stars, self-luminous cosmical bodies move about