us to the distribution in space of cosmical bodies—the periods of variable stars—and the slow revolution of double stars. That which, from its very nature, is not amenable to measurement, such as the relative position and configuration of starry strata or rings of stars, the arrangement of the universe, and the effects of powerfully metamorphic physical forces* in the sudden appearance or extinction of the so-called new stars, excite the mind the more deeply and vividly, its touching on the confines of the graceful domain of fancy.

We purposely abstain in the following pages from entering on the consideration of the connection existing between our solar system and the systems of other fixed stars, nor shall we revert to the question of that subordination and annexation of cosmical systems which might almost be said to force itself on our notice from intellectual necessity; nor yet will we consider whether our central body, the Sun, may not itself stand in some planetary dependence on a higher system —not even, perhaps, as a main planet, but merely as a planetary satellite, like Jupiter's moons. Limited within the more familiar sphere of our solar region, we, however, enjoy this advantage, that with the exception of what refers to the signification of the surface-appearance or gaseous envelopes of the revolving cosmical bodies, the simple or divided tails of comets, the ring of the zodiacal light, or the mysterious appearance of meteoric asteroids, almost all the results of observation admit of being referred to numerical relations, as the deductions of strictly-tested presuppositions. It does not, however, belong to the sketch of a physical description of the universe to test the accuracy of such presuppositions, its province being simply to give a methodical arrangement of numerical results. They constitute the important heritage which, ever augmenting, is bequeathed by one century to another. A table, comprising the numerical elements of the planets (that is to say, their mean distances from the Sun, sidereal periods of revolution, the eccentricity of their orbits, their inclination toward the ecliptic, their diameter, mass, and density), would now embrace within very narrow limits the record of the great intellectual conquests of the present age. Let us for a moment transport ourselves in imagination to the times of the ancients, and fancy Philolaüs the Pythagorean, the instructor of Plato, Aristarchus of Samos, or Hipparchus, in possession of such a numerical table, or of a graphic rep-

* On the appearance of new stars, and their subsequent disappearance, see p. 151–164.