

earnest observation of a class of phenomena, some of which could not even escape the naked eye. Simon Marius described in 1612 the nebula in Andromeda, and Huygens, in 1656, drew the figure of that in the stars of the sword of Orion. Both nebulae might serve as types of a more or less advanced condensation of nebulous cosmical matter. Marius, when he compared the nebula in Andromeda to "a wax taper seen through a semi-transparent medium," indicated very forcibly the difference between nebulae generally and the stellar masses and groups in the Pleiades and in Cancer, examined by Galileo. As early as the sixteenth century, Spanish and Portuguese sea-farers, without the aid of telescopic vision, had noticed with admiration the two Magellanic clouds of light revolving round the south pole, of which one, as we have observed, was known as "the white spot" or "white ox" of the Persian astronomer Abdurrahman Sufi, who lived in the middle of the tenth century. Galileo, in the *Nuncius Siderius*, uses the terms "*stellæ nebulosæ*" and "*nebulosæ*" to designate clusters of stars, which, as he expresses it, like *areolæ sparsim per æthera subfulgent*. As he did not bestow any especial attention on the nebula in Andromeda, which, although visible to the naked eye, had not hitherto revealed any star under the highest magnifying powers, he regarded all nebulous appearances, all his *nebulosæ*, and the Milky Way itself, as luminous masses formed of closely-compressed stars. He did not distinguish between the nebula and star, as Huygens did in the case of the nebulous spot of Orion. These are the feeble beginnings of the great works on *Nebulae*, which have so honorably occupied the first astronomers of our own time in both hemispheres.

Although the seventeenth century owes its principal splendor at its beginning to the sudden enlargement afforded to the knowledge of the heavens, imparted by the labors of Galileo and Kepler, and at its close to the advance in mathematical science, due to Newton and Leibnitz, yet the greater number of the physical problems which occupy us in the present day likewise experienced beneficial consideration in the same century. In order not to depart from the character peculiarly appropriate to a history of the contemplation of the universe, I limit myself to a mere enumeration of the works which have exercised direct and special influence on general, or, in other words, on cosmical views of nature. With reference to the processes of light, heat, and magnetism, I would first name Huygens, Galileo, and Gilbert. While Huygens was occu-