

tra fixa of Manilius, which corresponds with our term fixed stars.* This idea of fixity leads to the secondary idea of immobility, of persistence in one spot, and thus the original signification of the expressions *infixum* or *affixum sidus* was gradually lost sight of in the Latin translations of the Middle Ages, and the idea of immobility alone retained. This is already apparent in a highly rhetorical passage of Seneca, regarding the possibility of discovering new planets, in which he says (*Nat. Quæst.*, vii., 24), "Credis autem in hoc maximo et pulcherrimo corpore inter innumerabiles stellas, quæ noctem decore vario distinguunt, quæ aëra minime vacuum et inertem esse patiuntur, quinque solas esse, quibus exercere se liceat; *ceteras stare fixum et immobilem populum?*" "And dost thou believe that in this so great and splendid body, among innumerable stars, which by their various beauty adorn the night, not suffering the air to remain void and unprofitable, that there should be only five stars to whom it is permitted to be in motion, while all the rest remain a fixed and immovable multitude?" This fixed and immovable multitude is nowhere to be found.

In order the better to classify the main results of actual observations, and the conclusions or conjectures to which they give rise, in the description of the universe, I will separate the astrognostic sphere into the following sections:

I. The considerations on the realms of space and the bodies by which they appear to be filled.

II. Natural and telescopic vision, the scintillation of the stars, the velocity of light, and the photometric experiments on the intensity of stellar light.

III. The number, distribution, and color of the stars; the stellar swarms, and the Milky Way, which is interspersed with a few nebulæ.

IV. The newly-appeared and periodically-changing stars, and those that have disappeared.

V. The proper motion of the fixed stars; the problematical existence of dark cosmical bodies; the parallax and measured distance of some of the fixed stars.

VI. The double stars, and the period of their revolution round a common center of gravity.

VII. The nebulæ which are interspersed in the Magellanic clouds with numerous stellar masses, the black spots (coal bags) in the vault of heaven.

* Cicero, *De Nat. Deorum*, i., 13; Plin., ii., 6 and 24; Manilius, ii., 35