

may well be assumed, there exist, in the regions of space, dark invisible bodies in which the process of light-producing vibration does not take place, these dark bodies can not fall within the sphere of our own planetary and cometary system, or, at all events, their mass can only be very small, since their existence is not revealed to us by any appreciable disturbances.

The inquiry into the quality and direction of *the motion of the fixed stars* (both of the *true* motion proper to them, and also of their *apparent* motion, produced by the change in the place of observation, as the earth moves in its orbit), the *determination* of the distances of the fixed stars from the sun by ascertaining their *parallax*, and the conjecture as to the part *in universal space toward which our planetary system* is moving, are three problems in astronomy which, through the means of observation already successfully employed in their partial solution, are closely connected with each other. Every improvement in the instruments and methods which have been used for the furtherance of any one of these difficult and complicated problems has been beneficial to the others. I prefer commencing with the parallaxes and the determination of the distances of certain fixed stars, to complete that which especially relates to our present knowledge of isolated fixed stars.

As early as the beginning of the seventeenth century, Galileo had suggested the idea of measuring the "certainly very unequal distances of the fixed stars from the solar system," and, indeed, with great ingenuity, was the first to point out the means of discovering the parallax; not by determining the star's distance from the zenith or the pole, "but by the careful comparison of one star with another very near it." He gives, in very general terms, an account of the micrometrical method which William Herschel (1781), Struve, and Bessel subsequently made use of. "Perchè io non credo," says Galileo,* in his third dialogue (*Giornata terza*), "che tutte le stelle siano sparse in una sferica superficie *egualmente distanti da un centro*; ma stimo, che le loro lontananze da noi siano talmente varie, che alcune ve ne possano esser 2 e 3 volte più remote di alcune altre; talchè quando si trovasse col telescopio *qualche picciolissima stella vici-*

* *Opere di Galileo Galilei*, vol. xii., Milano, 1811, p. 206. This remarkable passage, which expresses the possibility and the project of a measurement, was pointed out by Arago; see his *Annuaire pour 1842* p. 382.