

Description of Books" (1853); "The Progress of the Doctrine of the Earth's Motion between the Times of Copernicus and Galileo" (1855). In these papers he insists very rightly upon the distinction between the *mathematical* and the *physical* aspect of the doctrines of Copernicus: a distinction corresponding very nearly with the distinction which we have drawn between Formal and Physical Astronomy; and in accordance with which we have given the history of the Heliocentric Doctrine as a Formal Theory in Book v., and as a Physical Theory in Book vii.

Another interesting part of Mr. De Morgan's researches are the notices which he has given of the early assertors of the heliocentric doctrine in England. These make their appearance as soon as it was well possible they should exist. The work of Copernicus was published, as we have said, in 1543. In September, 1556, John Field published an Ephemeris for 1557, "juxta Copernici et Reinholdi Canones," in the preface to which he avows his conviction of the truth of the Copernican hypothesis. Robert Recorde, the author of various works on Arithmetic, published among others, "The Pathway to Knowledge" in 1551. In this book, the author discusses the question of the "quietnes of the earth," and professes to leave it undecided; but Mr. De Morgan (*Comp. A.*, 1837, p. 33) conceives that it appears from what is said, that he was really a Copernican, but did not think the world ripe for any such doctrine.

Mr. Joseph Hunter also has brought to notice¹ the claims of Field, whom he designates as the *Proto-Copernican* of England. He quotes the Address to the Reader prefixed to his first *Ephemeris*, and dated May 31, 1556, in which he says that, since abler men decline the task, "I have therefore published this Ephemeris of the year 1557, following in it as my authorities, N. Copernicus and Erasmus Reinhold, whose writings are established and founded on true, certain, and authentic demonstrations." I conceive that this passage, however, only shows that Field had adopted the Copernican scheme as a basis for the calculation of Ephemerides; which, as Mr. De Morgan has remarked, is a very different thing from accepting it as a physical truth. Field, in this same address, makes mention of the errors "illius turbæ quæ Alphonsi utitur hypothesi;" but the word *hypothesis* is still indecisive.

As evidence that Field was regarded in his own day as a man who

¹ *Ast. Soc. Notices*, vol. iii. p. 3 (1833).