

which, as we have said, sound science prescribes, a Table to be habitually used for all observations. But great difficulties at this time embarrassed this investigation, for the parallaxes of the sun and of the planets were unknown, and very diverse values had been assigned them by different astronomers. To remove some of these difficulties, Richer, in 1762, went to observe at the equator; and on his return, Cassini was able to confirm and amend his former estimations of parallax and refraction. But there were still difficulties. According to La Hire, though the phenomena of twilight give an altitude of 34,000 toises to the atmosphere,¹ those of refraction make it only 2000. John Cassini undertook to support and improve the calculations of his father Dominic, and took the true supposition, that the light follows a curvilinear path through the air. The Royal Society of London had already ascertained experimentally the refractive power of air.² Newton calculated a Table of Refractions, which was published under Halley's name in the *Philosophical Transactions* for 1721, without any indication of the method by which it was constructed. But M. Biot has recently shown,³ by means of the published correspondence of Flamsteed, that Newton had solved the problem in a manner nearly corresponding to the most improved methods of modern analysis.

Dominic Cassini and Picard proved,⁴ Le Monnier in 1738 confirmed more fully, the fact that the variations of the Thermometer affect the Refraction. Mayer, taking into account both these changes, and the changes indicated by the Barometer, formed a theory, which Lacaille, with immense labor, applied to the construction of a Table of Refractions from observation. But Bradley's Table (published in 1763 by Maskelyne) was more commonly adopted in England; and his formula, originally obtained empirically, has been shown by Young to result from the most probable suppositions we can make respecting the atmosphere. Bessel's Refraction Tables are now considered the best of those which have appeared.

Sect. 2.—Discovery of the Velocity of Light.—Römer.

THE astronomical history of Refraction is not marked by any great discoveries, and was, for the most part, a work of labor only. The progress of the other portions of our knowledge respecting light is

¹ Bailly, ii. 612.

² Ibid. ii. 607.

³ Biot, *Acad. So. Comptes Rendu*, Sept. 5, 1836.

⁴ Bailly, iii. 92.