

approximated very remarkably to the truth when he gave it at  $7' 30''$ . Delambre,\* who did not take into account any of the observations made in his own time, with the exception of those of the first satellite, found  $8' 13''.2$ . Encke has very justly noticed the great importance of undertaking a special course of observations on the occultations of Jupiter's satellites, in order to arrive at a correct idea regarding the velocity of light, now that the perfection attained in the construction of telescopes warrants us in hoping that we may obtain trustworthy results.

Dr. Busch,† of Königsberg, who based his calculations on Bradley's observations of aberration, as rediscovered by Rigaud of Oxford, estimated the passage of light from the sun to the earth at  $8' 12''.14$ , the velocity of stellar light at 167,976 miles in a second, and the constant of aberration at  $20''.2116$ ; but it would appear, from the more recent observations on aberration carried on during eighteen months by Struve with the great transit instrument at Pulkowa,‡ that the former of these numbers should be considerably in-

1699, tom. viii., p. 435, 475; Delambre, *Hist. de l'Astr. Mod.*, tom. ii., p. 751, 782; Du Hamel, *Physica*, p. 435.)

\* Delambre, *Hist. de l'Astr. Mod.*, tom. ii., p. 653.

† *Reduction of Bradley's Observations at Kew and Wansted*, 1836, p. 22; Schumacher's *Astr. Nachr.*, bd. xiii., 1836, No. 309 (compare *Miscellaneous Works and Correspondence of the Rev. James Bradley*, by Prof. Rigaud, Oxford, 1832). On the mode adopted for explaining aberration in accordance with the theory of undulatory light, see Doppler, in the *Abhl. der Kön. böhmischen Gesellschaft der Wiss.*, 5te Folge., bd. iii., s. 754-765. It is a point of extreme importance in the history of great astronomical discoveries, that Picard, more than half a century before the actual discovery and explanation by Bradley of the cause of aberration, probably from 1667, had observed a periodical movement of the polar star to the extent of about  $20''$ , which could "neither be the effect of parallax or of refraction, and was very regular at opposite seasons of the year." (Delambre, *Hist. de l'Astr. Moderne*, tom. ii., p. 616.) Picard had nearly ascertained the velocity of direct light before his pupil, Römer, made known that of reflected light.

‡ Schum., *Astr. Nachr.*, bd. xxi., 1844, No. 484; Struve, *Etudes d'Astr. Stellaire*, p. 103, 107 (compare *Cosmos*, vol. i., p. 153, 154). The result given in the *Annuaire pour 1842*, p. 87, for the velocity of light in a second, is 308,000 kilomenes, or 77,000 leagues (each of 4000 metres), which corresponds to 215,834 miles, and approximates most nearly to Struve's recent result, while that obtained at the Pulkowa Observatory is 189,746 miles. On the difference in the aberration of the light of the polar star and that of its companion, and on the doubts recently expressed by Struve, see Mädler, *Astronomie*, 1849, s. 393. William Richardson gives as the result of the passage of light from the sun to the earth  $8' 19''.28$ , from which we obtain a velocity of 215,392 miles in a second. (*Mem. of the Astron. Soc.*, vol. iv., Part i., p. 68.)