

creased. The result of these important observations gave $8' 17'' \cdot 78$; from which, with a constant of aberration of $20'' \cdot 4451$, and Encke's correction of the sun's parallax in the year 1835, together with his determination of the earth's radius, as given in his *Astronomisches Jahrbuch für 1852*, we obtain 166,196 geographical miles for the velocity of light in a second. The probable error in the velocity seems scarcely to amount to eight geographical miles. Struve's result for the time which light requires to pass from the sun to the earth differs about $\frac{1}{100}$ th from Delambre's ($8' 13'' \cdot 2$), which has been adopted by Bessel in the *Tab. Regiom.*, and has hitherto been followed in the Berlin Astronomical Almanac. The discussion on this subject can not, however, be regarded as wholly at rest. Great doubts still exist as to the earlier adopted conjecture that the velocity of the light of the polar star was smaller than that of its companion in the ratio of 133 to 134.

M. Fizeau, a physicist, distinguished alike for his great acquirements and for the delicacy of his experiments, has submitted the velocity of light to a terrestrial measurement, by means of an ingeniously constructed apparatus, in which artificial light (resembling stellar light) generated from oxygen and hydrogen is made to pass back, by means of a mirror between Suresne and La Butte Montmartre, over a distance of 28,321 feet, to the same point from which it emanated. A disk having 720 teeth, which made 12·6 rotations in a second, alternately obscured the ray of light and allowed it to be seen between the teeth on the margin. It was supposed from the marking of a counter (compteur) that the artificial light traversed 56,642 feet, or the distance to and from the stations in $\frac{1}{180000}$ th part of a second, whence we obtain a velocity of 191,460 miles in a second.* This result, therefore, approximates most closely to Delambre's (which was 189,173 miles), as obtained from Jupiter's satellites.

Direct observations and ingenious reflections on the absence of all coloration during the alternation of light in the *variable stars*—a subject to which I shall revert in the se-

* Fizeau gives his result in leagues, reckoning 25 (and consequently 4452 metres) to the equatorial degree. He estimates the velocity of light at 70,000 such leagues, or about 210,000 miles in the second. On the earlier experiments of Fizeau, see *Comptes Rendus*, tom. xxix., p. 92. In Moigno, *Répert. d'Optique Moderne*, Part iii., p. 1162, we find this velocity given at 70,843 leagues (of $25=1^\circ$), or about 212,529 miles, which approximates most nearly to the result of Bradley, as given by Busch.