more striking. In 1676, a great number of observations of eclipses of Jupiter's satellites were accumulated, and could be compared with Cassini's Tables. Römer, a Danish astronomer, whom Picard had brought to Paris, perceived that these eclipses happened constantly later than the calculated time at one season of the year, and earlier at another season;—a difference for which astronomy could offer no account. The error was the same for all the satellites; if it had depended on a defect in the Tables of Jupiter, it might have affected all, but the effect would have had a reference to the velocities of the satellites. The cause, then, was something extraneous to Jupiter. Römer had the happy thought of comparing the error with the earth's distance from Jupiter, and it was found that the eclipses happened later in proportion as Jupiter was further off.[5] Thus we see the eclipse later, as it is more remote; and thus light, the messenger which brings us intelligence of the occurrence, travels over its course in a measurable time. By this evidence, light appeared to take about eleven minutes in describing the diameter of the earth's orbit.

This discovery, like so many others, once made, appears easy and inevitable; yet Dominic Cassini had entertained the idea for a moment,[6] and had rejected it; and Fontenelle had congratulated himself publicly on having narrowly escaped this seductive error. The objections to the admission of the truth arose principally from the inaccuracy of observation, and from the persuasion that the motions of the satellites were circular and uniform. Their irregularities disguised the fact in question. As these irregularities became clearly known, Römer's discovery was finally established, and the "Equation of Light" took its place in the Tables.

Sect. 3.—Discovery of Aberration.—Bradley.

Improvements in instruments, and in the art of observing, were requisite for making the next great step in tracing the effect of the laws of light. It appears clear, on consideration, that since light and the spectator on the earth are both in motion, the apparent direction of an object will be determined by the composition of these motions. But yet the effect of this composition of motions was (as is usual in such cases) traced as a fact in observation, before it was clearly seen as a consequence of reasoning. This fact, the Aberration of Light, the greatest astronomical discovery of the eighteenth century, belongs to Bradley,

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[5] Bailly, ii. 17. [6] Ib. ii. 419.