

SCIENCE

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FRIDAY, JULY 18, 1902.

THE GROUP-VELOCITY AND THE WAVE-VELOCITY OF LIGHT.*

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ALTHOUGH the determination of the important constant of nature—the velocity of light—has occupied the attention of scientists from the time of Galileo, and while astronomical and terrestrial methods have been so carefully refined that individual observers have obtained values differing by less than one part in 3,000, it is a significant fact that no terrestrial method thus far used gives the absolute velocity of light under all conditions. If a group of periodic disturbances are radiated out into any medium the velocity of the individual elements will in general be different from that of the mean of the group. Only in the one instance, the propagation in vacuo, is it likely that these two velocities are the same; and here physical methods, thus far, have not put the question to a test. In the case of ponderable media important data are to be expected. The astronomical method used by Römer in 1675 and founded on the observation of the eclipse of Jupiter's satellites gives the so-called group-velocity of light in vacuo. The observation of the fixed stars discovered by Bradley in 1727 gives the wave-

* Address of the retiring President and Chairman of Section B—Physics—of the American Association for the Advancement of Science, Pittsburgh meeting, June 28 to July 3, 1902.

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