

THE THEORY OF LIGHT.

The Theory of Light. By THOMAS PRESTON, M. A., Lecturer in Mathematics and Mathematical Physics, University College, Dublin. London and New York, Macmillan & Co., 1890. 8vo.

UNTIL within a very few years it has been a matter of considerable difficulty for American students interested in higher theoretical optics to pursue this study with advantage, for want of access to the original memoirs and the absence of any adequate presentation of their contents in any of the American text-books. For the students of the English universities, Airy's Undulatory Theory of Optics and Loyd's Wave Theory of Light have been the chief English helps until the publishing of Glazebrook's admirable Physical Optics. It has been a great pity that the clear and beautiful presentation of the subject given by President Barnard in 1862, and printed in the *Smithsonian Report* for that year, was not long since published in separate book form, as it would be to-day one of the very best books on the subject were it printed in a form accessible to college students having a fair command of elementary mathematics. I have been greatly surprised to find it so little known even among American students who have made a special study of the higher optics in European universities. Besides the English books referred to above, the admirable report of Professor Stokes on Double Refraction in the *British Association Report* for 1862, and the equally admirable later one on Optical Theories by Glazebrook in 1865, together with such books as Beer's Introduction to Higher Optics, Knochenhauer's Undulatory Theory of Light, Lord Rayleigh's articles in the *Encyclopædia Britannica* and the *Philosophical Magazine*, Verdet's *Leçons d'Optique Physique*, Poincaré, Briot, Sir William Thomson, and Professor Tait have heretofore supplied the special advanced student with most of his needs. It has been very desirable, however, that a treatise should be written for English-speaking students, similar to those which Verdet and Poincaré have written for the French, dealing both with profound theory and experimental facts. This seems to have been done by Professor Preston of Dublin.

The work in some respects resembles Verdet's *Optique Physique*. It begins, however, from a more elementary basis, and includes the more recent work of Lord Rayleigh and Professors Rowland and Hertz. In this latter respect as well as in some others, it is better than Glazebrook's Physical Optics. It lacks the splendid bibliography of Verdet, and is on the whole much more elementary.