

Preston's 'Light.'

The Theory of Light. By the late Dr. Thomas Preston. Fifth edition, edited by Prof. Alfred W. Porter. Pp. xxiv + 643. (London: Macmillan and Co., Ltd., 1928.) 25s. net.

IN the course of time every scientific book is overtaken by one of two fates; it lapses into oblivion or it is canonised as a classic. In the latter case there is always a temptation to extend its working life by the issue of revised and modernised editions. There is, of course, no objection to this so long as the author himself is able to undertake it, but after his death it becomes increasingly difficult to fuse the additions with the original into a homogeneous whole. The new 'Preston' is the fifth edition and Prof. Porter the third editor, so that it would not have been surprising, in view of the development of the subject since 1890, if the 'joins' had shown here and there. As a matter of fact they are less evident than in the previous edition, in spite of the extensive modifications for which the present editor is responsible. He has wisely removed, for example, all direct indications of interpolated matter such as were rather unnecessarily given by his predecessors. The new diagrams are more easily recognisable, since they are all black on white ground, whilst Preston's are nearly all white on black ground. In order partly to compensate for the considerable additions he has made, Prof. Porter has removed some matter, mainly mathematical, which will certainly never be missed by the majority of readers.

The new matter falls mainly under the head of physical optics, but some additions are made in geometrical optics also, notably in connexion with thick lenses and the theory of aberrations. This is all to the good, since the original version was decidedly weak in these directions, but the treatment is still rather brief in comparison with that accorded to other sections of the subject. Another topic which quite justifiably claims more space than formerly, is that of resolving power of optical instruments. In order to avoid the common confusion between this quantity and a totally different one, the so-called 'resolving power' of spectrosopes and interferometers, the term 'chromatic resolving power' is introduced to designate the latter. This is an innovation which should be welcomed and adopted by all teachers and students of the subject, particularly as Prof. Porter handles these matters in lucid and masterly fashion.

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The section on diffraction has been largely recast with the view of distinguishing more definitely than is usual between the Fresnel and Fraunhofer types of fringes. Some important additions have been made to the theory of the diffraction grating, the discussion of the intensity distribution being especially valuable in view of the misconceptions which are prevalent amongst students—and some others. The newer interferometers (Fabry-Perot, Lummer-Gehrcke and echelon) are adequately treated from the purely theoretical point of view, but it would have been very instructive to bring out more clearly the relationships between them and to contrast their properties in some detail. The determination of stellar diameters by Michelson's interferometer method is naturally the subject of an additional section, and the theory is presented in a very neat and concise form. An account is also given of Michelson's very recent measurements of the velocity of light.

Of the remaining changes, the most important is an expansion of the treatment, previously very brief, of the electromagnetic theory, so as to include the phenomena of reflection, refraction, dispersion, and propagation in crystalline media. The necessary space for this is appropriately secured by judicious abbreviation of the elastic solid theory. A minor reform, but one which will be a great boon to the assiduous reader, is that index references are now to pages instead of to sections as formerly, but the latter system is still retained in the text.

There are a few trivial misprints, and in several cases references to other sections are erroneous on account of their having been renumbered. The production is entirely admirable, and it is beyond question that the value of the book has been very considerably increased. So has the price, but by present standards it is by no means excessive.

Experimental Zoology.

Experimental Embryology. By Prof. T. H. Morgan. Pp. xi + 766. (New York: Columbia University Press; London: Oxford University Press, 1927.) 37s. 6d. net.

UNTIL quite recently, experimental methods in zoology were restricted to comparatively isolated fields of research and there seemed little prospect of their application to problems of general interest. For half a century the concepts of phylogenetic morphology not only maintained their own intrinsic interest but also were the source of peculiarly sound and fruitful work. To-day, how-