The development of the new theory is taking place with great rapidity, and several applications have already proved successful; only a few of these can be mentioned here. Pauli has shown that the Balmer formula for the hydrogen spectrum can be accounted for quantitatively, as well as the influence of electric and magnetic fields on this spectrum. A theory of the Stark effect based on Schrödinger's ideas has been presented by Epstein, who considers the radiation from a hydrogen-like atom in an electric field. The calculated positions of the components of the spectral lines practically coincide with those obtained in Epstein's old theory, which gave excellent agreement with experiment. The main interest lies in the expressions for the intensities, which agree with the observed values better than those deduced by Kramers from the correspondence principle. Schrödinger himself has discussed the same problem. Brillouin has treated the subject of rotation spectra by the calculus of matrices and has found experimental verification for certain of the theoretical deductions. Dirac has discussed the extension of the theory to relativity mechanics, and in particular to the theory of Compton scattering, and obtained results which can be tested by experiment.

One test of a scientific theory is its comprehensiveness, and the wide sweep of the new quantum mechanics is shown not only in the various ways of formulating it in mathematical language, but also in the physical ideas that may be associated with it. It is probable that the views of the quantum suggested by E. T. Whittaker and by the present writer, in which its magnetic aspects are emphasised, may be simply related to the new theory. In a recent paper Whittaker has described a simple light quantum in which a disembodied magnetic molecule, travelling with the speed of light, forms a singularity on the wave front and confers upon it the desired quantum properties. It may be suggested that such a quantum is related to a quantum magnetic tube on one hand, and to Schrödinger's wave mechanics on the other.

In discussing the relation between the quantum theory and the classical laws, Dirac remarks that the new theory "suggests that it is not the equations of classical mechanics that are in any way at fault, but that the mathematical operations by which physical results are deduced from them require modification. *All* the information supplied by the classical theory can thus be made use of in the new theory." H. S. ALLEN.

Our Bookshelf.

A Text-Book of Organic Chemistry: Historical, Structural and Economic. By Prof. John Read. (Bell's Natural Science Series.) Pp. xii + 680. (London: G. Bell and Sons, Ltd., 1926.) 12*s.* 6*d.* net.

OWING to the fact that systematic organic chemistry is but rarely taught in our public and secondary schools, elementary text-books on the subject are far less numerous than books on the inorganic branch. We have, it is true, a few excellent introductions to organic chemistry, but there is still room for a few more, especially if, like the present work, they are written in an agreeable style, are accurate, do not intimidate the beginner with a vast mass of unrelated facts, and, above all, show traces of original treatment.

Prof. Read departs from precedent by prefacing the subject with a fifty-page sketch of the development of chemistry as a whole, and although one might urge that much of this matter is not strictly relevant, the innovation is nevertheless welcome, not only because it is well done, but also because this phase of chemistry needs more emphasis than it has been given in the past. Another useful feature of the book is the insertion of references to industry and economics, which, as the author states, undoubtedly stimulate and maintain the interest of students. In this connexion, however, it is important that the statements and figures should be as up-to-date as possible, and that the period of time to which they relate should be precisely stated.

In the book under notice one would expect to, but does not, find adequate references to such recent and important matters as the large-scale manufacture of urea, cellulose-nitrate varnishes, acetic acid from cellulose by anaerobic fermentation, insulin, and the 'berginisation' of coal. Further, wholesale prices are far more important than those charged by the retailer, and when we read (p. 314) that "commercial oxalic acid costs about 10*d.* per lb., and the purified substance about 1*s.* 6*d.* retail," we can but marvel at the patience of the small consumer, because for a long time past the market price of the 98-100 per cent. commodity has been less than 6*d.* a pound, and now it is less than 4*d.*

Prof. Read and his publishers deserve our thanks for producing a thoroughly sound and interesting work.

The Modern Soap and Detergent Industry, including Glycerol Manufacture. By Dr. Geoffrey Martin. In 3 vols. Vol. 3: *The Manufacture of Glycerol.* (Containing the Index to the Complete Work.) Pp. xi + 78 + 36 + 13 + 20 + 8 + 41 + 57. (London: Crosby Lockwood and Son, 1926.) 30*s.* net.

THE working up of the by-product, glycerol, of the soap and stearin candle industry is of such economic importance that the author has felt justified in allotting this entire volume to the subject of glycerol. In attempting to prepare a complete treatise (as the present volume claims to be) on any branch of chemical industry, great