physics and quantum theory, and include many personal reminiscences. The Rutherford Memorial Lecture of 1958 in its expanded form completed in 1961 is reprinted from the *Proceedings of the Physical Society* (78, 1083; Dec. 1961); "The Genesis of Quantum Mechanics", a translation of the German, was delivered to celebrate the sixtieth birthday of Werner Heisenberg and recounts many of the conversations and discussions between Bohr and Heisenberg; and in the final essay of the book Bohr at the opening of the 1962 Solvay conference describes his impressions of previous conferences back to 1911, pointing out the steady development and important steps in the progress to the understanding of present-day quantum physics. To those who knew Niels Bohr, re-reading these essays will bring back pleasant memories of Bohr as a friendly personality and of his stimulating discussions and clear thinking and writing.

Complex Angular Momenta and Particle Physics

By Dr. Euan J. Squires. (Frontiers in Physics: a Lecture Note and Reprint Series.) Pp. x+161. (New York and Amsterdam: W. A. Benjamin, Inc., 1963.) 5.95 dollars, paper; 9 dollars, cloth.

ABOUT three years ago it was suddenly realized that the treatment of angular momentum as a complex variable, being quietly developed by Regge and his group, would be a powerful and exciting tool in particle theory and high-energy physics. Since then, a whole new industry has sprung up to exploit this idea, with its own vocabulary, theorems and folklore.

There were naturally no text-books at first, but some are now appearing and the subject of this review is a worthy example. It is billed as a "lecture note and reprint volume", suggesting a rough and ready presentation, but this is not a fair description. Dr. Squires has written a careful, reasoned and rather condensed account of the formal theory in sixty pages. The next thirty are devoted to the main applications and the experimental evidence, with a few miscellaneous developments. Finally, come sixty pages of assorted reprints, including several of the most significant original papers.

This is certainly a useful book, both for learning the subject and for later reference. It is authoritative, for the author has worked in this field almost from the start. It is also reasonably up to date; the main text is dated April 1963, but a short note about more recent developments was inserted at the proof stage in August.

The original lectures were given at Cambridge, so this book is aimed at mathematicians with a little physics rather than physicists with a little mathematics. But this is fair enough; the complex angular momentum game was invented by mathematicians and you need a good bit of mathematics to play it well. R. J. N. PHILLIPS

Eight-Place Tables of Trigonometric Functions for Every Second of Arc

With an Appendix on the Computation to Twenty Places. By Jean Peters. Pp. xi+954. (New York: Chelsea Publishing Company, 1963.) 18.50 dollars.

THIS reprint is a handsome memorial to the two great table-makers of our time, for, as Peters tells us in his preface, the enterprise was planned in conversation with L. J. Comrie in 1930, and a substantial fraction of the computation was carried out by him. The first edition appeared in 1939, there was a war-time edition published in the United States in 1943, and the Chelsea Publishing Co. has now added the volume to its long and impressive list of reprints.

The title describes the main table. At an opening, the sine, cosine, tangent and cotangent are given at every second for each of six consecutive minutes: the three leading digits occur only at the head and foot of a column, but ample advertisement of a mid-column change in a leading digit is given. Supplementary tables give: $\theta \cot \theta$ for 0° (10″) 2°; sine and cosine to 21 places, 0° (10′) 45°; sine and cosine to 21 places, 0°(1″) 0° 10′, with first, second and third differences.

Since each page of the main table carries 732 entries, apart from head and marginal arguments, the page is bound to be heavy, but the use of a pleasant fount of old-style 'head and tail' figures somewhat relieves the weight. Precision in selecting a row is assisted by boxing the tenth second, with horizontal leads separating blocks of three seconds. There are too many vertical rules, and a clearer page could have been obtained by eliminating those between the four functional columns.

For information about the vital matter of accuracy we naturally turn to the Fletcher, Miller, Rosenhead and Comrie *Index*. One error in the original edition is reported, not corrected in this reprint; and an error which crept into the first reprint is also reproduced here. It is not surprising that the *Index* remarks that, "Peters was the most industrious and accurate table-maker of this century, if not indeed of all time". T. A. A. BROADBENT

Plant Metabolism

By Prof. H. E. Street. (The Commonwealth and International Library of Science, Technology, Engineering and Liberal Studies. Botany Division, Vol. 2.) Pp. ix+238. (London: Pergamon Press; New York: The Macmillan Company, 1963.) 20*s*. net.

IN this book, Prof. Street deals with expected topics such as enzyme action, photosynthesis, respiration and protein synthesis, but in addition he covers ground which, in the past, has not been regarded as falling within the province of metabolism. Thus there are sections on osmotic properties and water-uptake by cells, on ion-intake and translocation, and also on growth (including mitosis) and differentiation. He holds the reasonable view that the last two of these are appropriately included because they are reflexions of changing metabolism. The justification for including the others is doubtless that they may, or do, involve expenditure of energy of metabolic origin.

The book is intended primarily for students at universities and elsewhere who have already attained the Advanced Level of the General Certificate of Education in biology and organic chemistry, and such students are indeed fortunate that Prof. Street has found time to allow them the benefit of his stimulating, well-informed mind and marked faculty for exposition. More advanced students also will learn a lot by reading this book, as have I. Particularly valuable are the chapters on the regulation of metabolism and on growth and differentiation. Thoroughness of treatment is a notable feature; terms such as 'falling' electrons, triplet state, hydrogen bonds, Michaelis constant, and positive, negative and cross-feedback mechanisms, which have been known to worry plant physiologists, are clearly explained.

With so much in the book which is praiseworthy it will seem rank ingratitude to offer any criticisms. Misprints are, however, rather numerous, some forty having been noted on a first reading, though few of them will cause any uncertainty in the reader's mind. One which may is the use on p. 3 and elsewhere of the numeral '1' as the abbreviation for 'litre'. The legends or lettering to text-figures could in some cases have been improved (for example, Figs. 1, 36 and 40), while Fig. 31 does not show the features which the text indicates. Slips occur on p. 31 in the treatment of the osmotic properties of cells, while elsewhere there is some uncertainty about the sense in which the author is using the term 'Pasteur effect'. These are only minor blemishes in a book which cannot fail to exert a beneficial effect on the study and the teaching of metabolic aspects of plant physiology. The book is (to adapt Prof. Fogg's phrase) of semi-disposable type, well illustrated and reasonably priced. G. BOND