

BOOK REVIEWS

In Honour of J. L. Synge

General Relativity. Edited by L. O'Raikeartaigh. Papers in honour of J. L. Synge. Pp. ix+277. (Clarendon: Oxford; Oxford University: London, August 1972.) £7.

DURING his long illustrious career J. L. Synge has held mathematical posts of the highest distinction and influence in Ireland, Canada and the United States. The mathematicians who in one way or another stand in his debt could have produced a mighty library of volumes in his honour on his recent 75th birthday. As it is L. O'Raikeartaigh and the other editors of the present book have selected general relativity as the field with which the name of Synge is most indissolubly linked. Within that field they have selected certain topics upon which they have contributions by Lanczos, Balazs, Ellis and Sciamia, Ehlers and Pirani and Schild, Trautman, Penrose, Bonnor and Vaidya, Taub, I. and J. R. Robinson, Florides, Chandrasekhar, Israel, Thompson. The outcome is a balanced, high grade, contemporary conspectus of typical work by leading workers, which should prove of greater lasting value than most such compilations.

The first section, "General reviews", ranges from history to a rather global survey of "Global and non-global problems in cosmology." The second is called "Mathematical foundations"; it deals with some deep problems of the formulation of general relativity and is the most sophisticated part of the book. The third section is about "Solutions to Einstein's equations" concerning the accelerated charged particle, self-gravitating fluids, the general motion of a massive particle in general relativity, rotating bodies. The last section, labelled "Thermodynamics", deals with the relativistic equilibrium of a certain model "star", the relativistic Boltzmann equation, and the relativistic kinetic theory.

The book has the air of lively, high-level, intellectual activity. In the nature of the case, it deals with the understanding of relativity theory more than understanding the physical world. But, after all, much of the mathematical work of the two centuries following Newton dealt with abstract analytical dynamics and not with real physics; yet in due course some of the most abstract (Hamiltonian) theory proved to be exactly what was needed as a starting point for quantum mechanics in dealing

decidedly with real physics. Some of the developments described in this book may likewise find unexpected applications. Indeed, there are astrophysicists who believe that this is already happening in regard to gravitational collapse, gravitational radiation, and the like.

The way Synge himself features in the work is shown—inadvertently—by the frontispiece. This is a picture of his well filled blackboard, with Synge in the middle distance, in characteristic pose all right, but not quite in focus. The introduction is a brief appreciation, and at the end of the book there is a laconic *curriculum vitae* followed by a bibliography of eleven books and over 200 "other publications", some "in press", showing how active Synge remains. The want of more personal prominence is consonant with Synge's lack of self-seeking. Nevertheless, he is one of the most powerful and colourful scientific personalities of his time; while this book does due honour to his scientific standing, one hopes very ardently for another in which the blackboard will change places with the man.

W. H. MCCREA

Science of Surfaces

Progress in Surface Science. Edited by Sydney G. Davison. Vol. 1. Pp. xii+420. (Pergamon: Oxford and New York, June 1972.) £12.

SURFACE scientists, on the whole, have very wide interests, as instance the founding fathers Hardy, Langmuir and Rideal. Traditionally a field for physical chemists, there is increasing participation by physicists and biologists. This makes the topic educationally broad, particularly valuable therefore for postgraduate students. The present series starts off on sound lines with articles by Goodwin and Mark on the "Influence of Chemisorption on the Electrical Conductivity of Thin Semiconductors", and by Wocieczowski on the "Quantum Theory of Adsorption on Metal Surfaces". There follows S. R. Morrison's "Surface Phenomena associated with the Semiconductor/Electrolyte Interface" which deals clearly with an area of interest to electrochemists. Morrison's contribution raises the problems involved in marrying the electronic energy bands to the ionic double layer at the interface. T. W. Haas and four colleagues contribute a "Bibliography of Low Energy Electron Diffraction and Auger Electron Spectroscopy", a somewhat

odd idea which, on reflexion, has a certain utility. But if all the articles had this character (of bibliographies), I doubt whether the series would attract many readers. An article by N. I. Ionov deals with "Surface Ionization and its Applications", a clear account of the theoretical background of a subject linking up with a number of important practical applications (mass spectrometer ion sources is one). Finally, Weiss and Harlos, in "Short-Term Interactions between Cell Surfaces", start from DLVO theory and end with experiments on cell adhesion, but omit considerations of specificity. The Wocieczowski and Ionov articles have been adapted from previous publications in Polish and Russian respectively.

On the whole, the volume is of great interest and one can state that a good start has been made with the series. In name, however, it differs by only one word from *Recent Progress in Surface Science*, which is already established in the literature. Some confusion is clearly possible here unless the full references, including publishers' and editors' names, are cited (as they usually are). *Recent Progress* so far seems to have laid weight on the colloid side, while *Progress* in its first volume emphasizes the physics side. The danger of two review journals for one topic lies in the possible lowering of standards and duplication of effort. This problem arose in catalysis some years ago, however, and the indications there are that the material available is sufficient for standards of both these publications to remain high and one must confidently expect that the same will prove true for surface science.

D. D. ELEY

Photosynthetic Enzymes

Photosynthesis, Part A. Edited by Anthony San Pietro. (Methods in Enzymology, Vol. 23.) Pp. xix+734. (Academic: New York and London, August 1971.) \$29.50; £13.75.

WHAT does the laboratory worker do if he wishes to prepare or assay an enzyme? If he is lucky enough to work in some institutions he may need do no more than walk down the corridor and ask the expert. In other circumstances he may go to the *cordon bleu* of enzymology as represented by the volumes in this well known series. The rationale is much the same as in *haute cuisine* and a good recipe clearly deserves a better fate than to perish