trated, there is no reference to the work of Stensio and his school, so essential to an understanding of the early fishes, and there is no mention of the pre- and exo-erythrocytic stages of the malarial parasite necessary to the comprehension of the disease.

It is possible to find slips and errors; but for one author to have accomplished so exacting a task is a matter for congratulation, and any reader will be struck by the large amount of information it contains. The illustrations are all good, but some deserve special notice; these are a number of original figures of fishes and a number of very pleasing sketches of living marine animals made in the Naples aquarium.

TEXT-BOOK OF BIOCHEMISTRY

Textbook of Biochemistry

By Prof. Edward Staunton West and Prof. Wilbert R. Todd. Pp. x + 1,345. (New York: The Macmillan Company, 1951.) 90*s*. net.

THIS text-book will be welcomed by many teachers who have sought a comprehensive modern treatise suited to the needs of students taking an advanced course in biochemistry. Its most outstanding feature is the amount of detailed experimental evidence which the authors give throughout the book. This is particularly well done in the chapters on intermediary metabolism, which provide a very adequate and balanced account of this intricate subject. It is apparent that the authors have made every effort to bring this section up to date, even to the extent of inserting several pages on coenzyme A after the rest of the book had been printed. In a few of the earlier chapters, the information is obviously of less recent origin; but this will no doubt be put right in a second edition. Most of the detailed information given in the book is fully documented by numerous references to original papers and, wherever possible, the existence of recent reviews is also indicated. In addition, the introductory chapter of the book encourages the student to do his own exploration of biochemical literature by providing an excellent guide to the main journals, reviews and books (dates of publication and editions are omitted from the books) in which articles of biochemical interest are to be found.

In dealing with text-books of this scope, there are bound to be differences of opinion about what should be included. The inclusion of a good deal of physical chemistry at the beginning is fully justified, but it seems a pity that such a comprehensive book should not devote at least one chapter exclusively to plant biochemistry (there is a section on photosynthesis under carbohydrate metabolism), and another to the biochemistry of bacteria and fungi. No doubt limitations of space and the anthropocentric interests of medical readers dictate these omissions, but the type of reader to whom this text-book will prove most useful needs as broad an outlook as possible. There are also fewer figures and drawings than one might expect in a book of this size; this is particularly noticeable in the case of those illustrations which have been found perennially useful in the teaching of students, such as diagrams of the apparatus used in determinations of energy metabolism. A curious feature of the section of protein chemistry is the omission of any reference to paper partition chromatography, although six pages are devoted to other methods of separating amino-acids.

In general, however, this book represents a remarkable assimilation of biochemical knowledge on the part of the two authors, and they are to be congratulated on producing an advanced text-book of such quality without resorting to the technique of multiple authorship with its attendant loss of continuity.

H. N. MUNRO

A. W. CONWAY: SELECTED PAPERS

Selected Papers of Arthur William Conway

Edited by Prof. James McConnell. Pp. viii + 222. (Dublin: Dublin Institute for Advanced Studies, 1953.) 21*s*. net.

IRELAND has been the birthplace of several great mathematical physicists—above all, Sir William Rowan Hamilton. For a long time they were mostly at Trinity College, Dublin; but towards the end of the nineteenth century the torch passed to University College, Dublin, the staff of which included A. W. Conway and J. A. McClelland. This selection of the most important of Conway's papers has been edited by Prof. J. McConnell and published by the Dublin Institute for Advanced Studies, which was founded on the advice of Conway by his former pupil, Mr. de Valera. It is preceded by the twelve-page obituary notice written for the Royal Society by Sir Edmund Whittaker, which contains a detailed analysis of Conway's researches.

The first paper reproduced and several later ones concern the classical electromagnetic equations and the point electron, which is regarded as a moving singularity of the differential equations. The use of contour integration to calculate the field is particularly striking. This work on moving electrons led on naturally to the study of the origin of spectra. Conway's paper of 1907 was the first to break away from the old idea that the spectra corresponded to the natural periods of oscillation of the atom, though it fell short of the much greater advance made by Bohr six years later. In 1913 Conway returned to the problem. He had not yet accepted the point of view of Bohr's paper, published a few months earlier, and tried to utilize J. J. Thomson's suggested model of the atom. However, in later years Conway finally accepted the Rutherford model of the atom, as used by Bohr, and published papers on these lines dealing with non-central forces and with some discrepancies between experiment and theory in the helium spectrum. He also treated the helium problem by Schrödinger's wave mechanics.

The heavy task of editing (in collaboration with Profs. J. L. Synge and A. J. McConnell) Hamilton's collected papers on optics and dynamics, many from previously unpublished manuscripts, led Conway to extend some of Hamilton's work. He showed that the Hamiltonian principal function can be obtained immediately from a complete integral of Hamilton's partial differential equation. The last four papers in this selection apply Hamilton's quaternions, for which Conway had long cherished a great admiration, to relativity and quantum mechanics. In particular, he used quaternions to replace matrices in the study of Dirac's relativistic wave equation. Thus his last paper, in 1948, may be considered as the natural development of his first work, the essay on quaternions written for a junior fellowship in 1900.

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