

normally available for assay; but the remedy is obvious. In general, criticism of this section must be very minor.

Section *C* describes the assay of enzyme activities. In the first article, devoted to medical applications, the characteristic enzyme patterns of different tissues are discussed, as also is the leakage of enzymes into body fluids. The application of enzyme assays to diagnosis will increase, and the process will be accelerated by this volume and its detailed bibliography. Apart from two short papers on enzyme measurements in food and agricultural chemistry (from which it would appear that progress in this field has lagged), much of the remainder of Section *C* describes assays of individual enzymes. Here perhaps the overlap with existing hand-books is most marked, but this part will nevertheless be very useful. It is followed by a detailed article, by F. Duspiva, on histochemical detection of enzymes. This paper will no doubt assist workers in this field.

Section *D* is devoted to biochemical reagents, and covers the sources, properties and stability of enzymes, co-enzymes and substrates. Here, and throughout the book, commercial suppliers of enzymes are given. Since many enzymes are not available commercially (despite the recent remarkable increase in the number which are), summaries of purification procedures are frequently given; it is unfortunate that these are sometimes not detailed enough to follow.

Enough has been said to indicate that this volume, despite its considerable (but very understandable) price, should be acquired by laboratories engaged in any work which might be described as even remotely biochemical.

P. K. TUBBS

MODERN TECHNIQUES IN ELECTROPHYSIOLOGY

Physical Techniques in Biological Research

Edited by William L. Nastuk. Vol. 6: Electrophysiological Methods, Part B. Pp. xiii + 425. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1963.) 103s. 6d.

SEVERAL of the previous volumes in this series might have been criticized as mainly covering techniques which had already been adequately discussed in numerous other publications. This cannot be said of the last three chapters of the volume under review, which are concerned with technical aspects of modern neurophysiology about which very few general accounts have been written in recent years. Thus Dr. R. E. Taylor discusses cable theory, Dr. J. W. Moore and Dr. K. S. Cole discuss voltage clamp techniques, and Dr. H. P. Schwan discusses determination of biological impedances. These articles are, on the whole, well presented, and should certainly be useful to newcomers entering the fields with which they deal, but some reservations must nevertheless be made. Two of the authors make the common error of attributing the discovery of animal electricity to Galvani in the 1790's, ignoring the facts that in 1775 John Hunter had already, in the pages of the *Philosophical Transactions*, hailed John Walsh as the discoverer, and that, in all probability, the credit should really be given to Michel Adanson who, on first handling an electric cat-fish in 1751, drew a correct parallel between its disconcerting effects and the discharge of a Leyden jar. This mistake is, no doubt, unimportant except to a reviewer who is an avowed partisan of electric fishes, but a more serious criticism is that it is questionable whether the authors have fully succeeded in meeting the needs of their most important class of reader. If it is correct to assume that the main function of such articles is to provide a practical guide for recruits rather than merely preaching to the converted, then they

should cover the ground as comprehensively as possible.

It therefore seems a pity that the voltage clamp technique should be considered almost exclusively in terms of the method used by American workers at Wood's Hole, in which internal potential is measured with a micro-pipette inserted transversely into the axon; it would surely have been helpful to have said something about the pros and cons of making the potential measurements with an internal wire, as in the method adopted by Hodgkin, Huxley and Katz at Plymouth. Similarly, under the heading of cable theory more prominence might have been given to problems involving the use of internal electrodes, which are likely to become increasingly important in future research; and a compilation might have been made of some of the solutions of cable equations that have proved most useful in practice, with a description of the exact way in which they have been applied experimentally. Lastly, although Dr. Schwan's chapter pays admirable attention to practical details, it is perhaps too narrowly restricted to alternating current methods, saying little about the advantages in some circumstances of working with step functions of current and voltage; and it is surprising that no mention is made of the presentation of results in the form of impedance locus diagrams.

The first three chapters of the book, by Drs. W. Siler, K. King, J. W. Moore, H. Dem and J. B. Walsh, describe the fundamentals of digital and analogue computers, operational amplifiers and the analysis of complex wave-forms. Although more detailed treatments of these topics are available elsewhere, electrophysiologists will be grateful for the inclusion of these concise and readable accounts alongside those of the more specialized techniques which follow.

R. D. KEYNES

FOSSIL OSTRACODA

Post-Palaeozoic Ostracoda

Their Morphology, Taxonomy, and Economic Use. By F. P. C. M. van Morkhoven. Vol. 1: General. Pp. vii + 204. 30 D.fl.; 60s.; 70.50 D.M. Vol. 2: Generic Descriptions. Pp. 478. 130s. (Amsterdam, London and New York: Elsevier Publishing Company, 1962-63.)

ALTHOUGH it is probable that Linnaeus included representatives of the bivalved Crustacea we now know as ostracods under the comprehensive name *Monoculus*, it was not until 1776 that they were first described as a distinct group by O. F. Müller under the name of *Cypris*. The first fossil ostracoda were recognized as such by Desmarest in 1813. During the next hundred years their study, though active, remained that of the specialist. As with so many other neglected fossils, it was Ulrich and Bassler who, recognizing their stratigraphical value, pioneered their investigation by the general geologist. Their work was largely confined to the Palaeozoic, and it was not until 1929, when C. I. Alexander initiated the critical investigation of the post-Palaeozoic ostracods of the Gulf Coast, that their importance to the oil industry became apparent. Since that time an accelerating spate of research has shown that, among microfossils, the ostracods are second only in importance to the Foraminifera. Indeed, there are many horizons in which ostracods provide better zonal indices than any other micro-fossil.

A recent German analysis of zone-fossils in micropalaeontology is illustrated by 59 plates; ostracods appear on 41 of these, Foraminifera on 40 and other microfossils on 13. It is, therefore, not surprising to find that there has been an increasing demand for a handbook that gathers together and summarizes information gleaned from the present flood of papers on the morphology and