

those non-genetical processes of heredity to which Waddington, Huxley and I have often called attention.

Popper writes very skilfully and reasons strongly. Those who are determined not to be persuaded by him had best not read him. Others will find his book a very notable addition to the furniture of world 3.

PETER MEDAWAR

Practical Calculation

Numerical Computation. By P. W. Williams. Pp. viii+191. (Thomas Nelson and Sons: London, October 1972.) £2.50 paper; £5 cloth.

THIS book has material on computer calculations, non-linear, polynomial, linear simultaneous, and ordinary differential equations, finite differences, curve fitting, numerical integration, and eigensolutions. Each chapter has worked examples, some exercises with answers at the end of the book, and bibliographical notes and references.

The book is not meant to be a mathematical text but a guide to good numerical practice; a sound idea, but difficult to achieve. Such a book must be modest in size, and one therefore wonders (a) why the first chapter includes Taylor's series, iteration, convergence acceleration, over-relaxation methods and Aitken's Δ^2 process, (b) why a chapter on polynomials which appear explicitly very rarely in practice, (c) why nothing on ordinary differential equations of boundary-value type, and (d) what principle governed the choice of material for which proofs are or are not given.

Most of the selected material is quite good, and the bibliographical notes are very good. But there are serious exceptions. First, one is irritated by many misprints, a page of numbers with no description, unexplained references to other material, and statements such as "If the Gauss-Seidel method fails to converge then the alternative Jacobi method is available".

More important, there are serious errors of fact and principle. These include incorrect statements on Richardson extrapolation, the need for partial pivoting, the partial instability of the Runge-Kutta method, weak instability, Richardson extrapolation with Simpson's rule, and a catastrophic example 4 on page 158 where the printed numbers are quite wrong and the conclusions quite dangerously fallacious.

I can therefore recommend this book only to those who can study it with the support of expert tuition. The rest should wait, hopefully, for a corrected second edition which could, indeed, be a useful addition to the literature.

L. FOX

Science of Synapses

Structure and Function of Synapses. Edited by George D. Pappas and Dominick P. Purpura. Pp. 308. (Raven: New York. Distributed in the Eastern Hemisphere by North-Holland, Amsterdam, 1972.) Hfl. 75; \$23.50.

Pappas and Purpura on behalf of the New York Society of Electron Microscopists are to be congratulated on the assembly of an authority of authors to write on anatomical, biochemical and physiological aspects of synapses. The book production is good and is marketed reasonably promptly in that the bibliographies include references to the literature of 1970. One may, as is conventional with reviewers today, reflect that the price makes it expensive for students. But it is sturdily built so that it should survive the abuses of the heavy use of the readership of general and departmental libraries.

Each of the twelve articles is by one or more authors distinguished in their special fields; Pappas, Akert, Bodian and Reese on the structure of synapses; Auerbach, Hall, Gerschenfeld and Whitaker on the biochemistry of synaptic transmission; Kandel on the functioning of *Aplysia* central nervous system; Bennett comparing electrical and chemical synaptic transmission; Purpura on the synaptic organization of the mammalian brain and Broom on the development of synapses—is a list of some of the contributors. The student to whom the preface directs this volume can obtain clear and generally balanced summaries of many of the currently active approaches to synaptic functioning. If an undergraduate, the student will need to be an able one because all the articles do deal with their subject in some detail. And in practice, the book is likely to be of most use to post-graduates and research workers in other aspects of the nervous system who want to know current work on synaptic mechanisms but are exhausted by the sight of piles of titles culled from *Current Contents* that yet remain unread.

A reviewer is supposed to criticize, preferably creatively, although in fact the species in general tends to prey on sins of omission and commission. Personally I do not feel like doing this because I find all the articles very worthwhile however much I might sometimes want to give alternative interpretations and emphasis to those problems discussed in this book which I think I understand. But there is one general problem with which books of this kind and most books published on the nervous system these days do not deal. That is the problem of providing general statements and synthèses of how far we have got in understanding the principles by which nervous systems

as a whole work. In fact, a beginner in neural studies may well be put off because she (or he) is likely to find few coherent descriptions of the woods, so full are we with information about the trees. At present mechanisms of neural action have to be studied in this "reductionist" way and it is true, as the preface states, that little can be said about, for example, the mechanisms of memory and behaviour. Yet somewhere along the line "the student" does not need to be put in contact with "the larger picture" if he is to grasp the general importance of the very good work in this kind of collection. Few of us (lacking the confidence and ability of, say, a Sherrington) want, perhaps quite rightly, to write such general articles. Perhaps then a university teacher, uncertain of his role as a projector of facts in this decade of an "explosion of knowledge", can console himself and inspire his audience with enthusiasm by giving a context to the most useful summaries provided by this book.

B. B. BOYCOTT

Ebullient Spectroscopy

Handbook of Commercial Scientific Instruments. Vol. I: *Atomic Absorption.* By Claude Veillon. Pp. xv+174. (Marcel Dekker: New York, September 1972.) \$11.75.

THE purpose of this series is to provide a guide to the purchaser of analytical instrumentation from amongst the many domestic and foreign products sold in the USA. This first volume deals with atomic absorption and surveys seventeen manufacturers' atomic absorption instruments model by model. Its aim is to present a guide to intending purchasers by providing specifications, descriptions, schematic drawings, photographs, details of accessories, approximate prices and so forth. The preface states that all of the information presented is based on material supplied by the manufacturers or their representatives. Subsequently it states that the views and opinions expressed are those of the author alone and no responsibility is accepted for their accuracy by the editor, publisher or instrument manufacturer (or their representatives). Since the author is an editor, this is somewhat confusing.

The author has, however, most certainly provided a valuable survey for intending purchasers. The introduction stresses the important features of various functions of AA instrumentation and explains much of the technical jargon that is bandied about by manufacturers. Whilst these may be elementary to a spectroscopist they might