Some recent books

AUTOMATING DECISIONS

Computers and the policy-making community

D. B. BOBROW and J. L. SCHWARTZ (editors)
Prentice-Hall, 1968. 374 pp. £6 5s.

The use of computers began with straightforward calculation, and then moved on to the mechanisation of clerical routines. It is now moving into a much more interesting phase as they are being used to inform those who make decisions. At present, it is difficult enough to assist those who have fairly humdrum executive decisions to make; but some enthusiasts already aspire to help the policy makers. Success or failure there will have little to do with computers as such and much to do with the extent to which policy making can be governed by rules and procedures stated explicitly and followed faithfully.

Policy has traditionally been the province of the literate; governed by feelings rather than by analysis, by nuances rather than by numbers; and the first problem is one of communication. In this case, the policy is foreign policy, and concerns experts in three quite separate disciplines: international relations, operational research and computing. In 1965, a conference at Livermore, USA, attempted to bridge these particular communication gaps, and, as is now customary, the proceedings of the conference have been reproduced in book form.

For engineers, the interest of Bobrow and Schwartz’ book lies not in its introduction to the computers—indeed, how many international-relations men will read or benefit from the chapters on computer technology and programming languages? Nor are o.r. men likely to go to the chapters on the simulation—and traditional internationalists would find them technical rather than stimulating.

However, this book could be read with profit by engineers interested in the application of computers to those ill-defined weak-structured problems that crop up where mathematical methods attempt to grip the real problems of human life, of which all that can be said with certainty is that they are complex and likely to remain so. The text is clearly written, and makes it clear—as many texts have not—that the limitations reside essentially in the scarcity of relevant data and incompleteness of our understanding of how to process it, rather than in the state of computer technology. The first chapter, especially, makes this point very well.

F. J. M. LAVER

Electronics

Electronics is a general introduction for the nonspecialist†

G. H. OLEEN
Butterworths, 1958. 493 pp. £4 4s.

Electronics techniques are widely used in almost every kind of measurement and control. For those scientists who are not specialists in electronic engineering, the rapidly expanding field of electronics must seem bewildering. Many excellent textbooks cater for examination candidates by supplying the necessary information and circuit analyses. Such books do not meet the needs of many scientists who wish to gain only a working knowledge of the operation of some of the electronic equipment which they use.

Nonspecialists rarely need to design electronic equipment from basic principles, but may find it helpful to be able to modify or extend the capabilities of their instruments and have sufficient knowledge to read specifications, buy equipment wisely and approach manufacturers knowledgeably.

The author of this volume has taught many undergraduates specialising in magnetic materials, and will be valuable to nonspecialists in electronics, for whom it is intended. Undergraduate electronics engineers and physicists describe the low-lying energy levels of all the more important transition-element ions in surroundings of various symmetries. There follows a chapter on the transition rates induced between the spin levels by microwave magnetic fields. The text is concise (75 pages) provide an easily digestible account of crystal field theory, including a treatment of the effect of covalent bonding. Most of the theory is concerned with ions in the iron transition group, but some attention is also given to rare-earth ions. The theoretical part of the book is completed by a short treatment of spin-lattice relaxation. Only 19 pages are devoted to experimental techniques, which is surprising in a work intended primarily for experimentalists. The final 30 pages provide an outline survey of the type of result obtained for each of the many paramagnetic ions which have been investigated. The author concludes his book by attempting to simulate the survey with an extensive bibliography of original papers and review articles.

The book should be a valuable addition to the shelves of anyone with a special interest in paramagnetic resonance. This phenomenon has few engineering applications, and those that do exist are not discussed. The text is concerned with the physics of the phenomenon and assumes a background of knowledge of appropriate initial physics; but it would also be useful to final-year undergraduates specialising in magnetic resonance. The author has set out with the primary aim of providing an elementary introduction to the theory of the phenomenon and brings him out on the other side stretched, but not broken, with a sound understanding of the behaviour of paramagnetic ions in crystalline environments.

Chapter 3 provides a brief résumé of basic quantum mechanics in 16 pages, and serves to remind the reader of the relevant features of the subject which he may have forgotten. Chapter 4 introduces the idea of a spin Hamilton and shows how it is used to describe the low-lying energy levels of all the more important transition-element ions in surroundings of various symmetries. There follows a chapter on the transition rates induced between the spin levels by microwave magnetic fields. The text is concise (75 pages) provide an easily digestible account of crystal field theory, including a treatment of the effect of covalent bonding. Most of the theory is concerned with ions in the iron transition group, but some attention is also given to rare-earth ions. The theoretical part of the book is completed by a short treatment of spin-lattice relaxation. Only 19 pages are devoted to experimental techniques, which is surprising in a work intended primarily for experimentalists. The final 30 pages provide an outline survey of the type of result obtained for each of the many paramagnetic ions which have been investigated. The author concludes his book by attempting to simulate the survey with an extensive bibliography of original papers and review articles.

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