

acids and bases and in tautomeric systems; M. S. Newman's description of molecular complexes and molecular asymmetry; and L. L. Ingraham's account of steric effects on spectra and related properties. Other chapters deal more specifically with problems of relative reactivities. A particularly welcome and authoritative discussion of the calculation of the magnitude of steric effects is given by F. H. Westheimer. Substitution at a saturated carbon atom is described by E. L. Eliel; G. S. Hammond and M. F. Hawthorne discuss steric effects in aromatic substitution; and D. J. Cram gives accounts of intramolecular rearrangements and of olefin-forming elimination reactions. Cleavage of the carbon-carbon bond is described by H. H. Wasserman, and steric effects among the common organo-metallic compounds by G. F. Wright. M. S. Newman contributes a chapter on additions to unsaturated systems, and R. W. Taft discusses attempts to separate polar, steric and resonance effects on reactivity.

The contributors are all active in research, and have special interests in the fields which they cover. This adds to the interest and value of the work. Prof. Newman is to be congratulated and thanked for editing such an excellent volume. As a general criticism, it might be maintained that the American point of view is, in some chapters at least, promulgated with less than adequate judgment; but it is a book which will be of value to everyone interested in organic chemical reactivity. It is well indexed and well printed; its price will ensure that most chemists in Britain will consult it, when they need to, in their nearest library.

P. B. D. DE LA MARE

## DOUBLE MEANINGS

### Digital Calculating Machines and their Application to Scientific and Engineering Work

By G. A. Montgomerie. Pp. viii + 262. (London and Glasgow: Blackie and Son, Ltd., 1956.) 30s. net.

### The Management Approach to Electronic Digital Computers

By J. Sandford Smith. Pp. xi + 227. (London: Macdonald and Evans, Ltd., 1957.) 35s.

NEITHER of these books achieves a very profound level of treatment of its respective subject, and they are, to a certain extent, complementary in their approach both as to the machines themselves and to the applications which are considered. G. A. Montgomerie's book is almost exclusively concerned with relatively simple devices of the desk-calculator variety, while that of J. Sandford Smith dismisses these useful tools in a few preliminary pages and then proceeds to a consideration of the newer electronic machines.

The prose style of both authors is good, but, whereas Sandford Smith nowhere descends to abstruse questions of notation and definition, Montgomerie attempts, in his introductory chapters, an obscure method of symbolizing digital operations which is likely to repel many readers.

A useful feature of both books is the attempt which is made to summarize the characteristics of available machines and to point out the way in which these may influence the prospective user in his choice, and although it may be argued that a short practical trial is worth any amount of verbal description, this

is not always possible, especially with the large machines.

Montgomerie's book is divided into twelve chapters. The first is introductory, the next two deal with adding machines, and Chapters 4-7 are concerned with machines which can multiply and divide. Then follow a chapter on numerical analysis and two on punched card machines and special purpose machines respectively. The remaining Chapters (10-12) describe automatic digital calculators and programming. Major faults are the extremely superficial chapters on numerical analysis and on special purpose machines. In the former the Newton-Raphson method for evaluating square roots is illustrated by a ponderous numerical example, but the author does not seem to think it worthy of mention that the process is an error-squaring one. The title of the book indicates that scientific and engineering applications are covered; but their only real mention occurs in Chapter 9, where the highly atypical Beavers-McEwan Fourier synthesizer occupies most of the space.

Sandford Smith's book has seventeen chapters, two appendixes, a bibliography and a glossary. After two introductory chapters, Chapters 3-8 discuss the units of a computer, 9 and 10 programming and checking, 11-13 the approach of the business executive to the acquisition of a machine. Then follows a chapter describing the available British machines, and the book concludes with essays on the impact of automation on the auditor and the worker. The first appendix contains an extract from the amusing "Rambles through Binland" by Michaelson and the second an account of the clerical operations involved in such things as agriculture, mining and building. There is little to criticize in the book, which (unless it is merely in the mind of the reviewer) must surely be unique in presenting a mathematical diagram (p. 97) which contains a dubious joke.

Both books are well written and reasonably priced: though neither can be described as authoritative they will doubtless find a wide circle of readers.

A. D. BOOTH

## SOLID SYSTEMS IN CHEMICAL ENGINEERING

### Chemical Engineering Practice

Edited by Herbert W. Cremer and Trefor Davies. Vol. 3: Solid Systems. Pp. vi + 534 + xviii. (London: Butterworths Scientific Publications; New York: Academic Press, Inc., 1957.) 95s.

THE third volume in the series "Chemical Engineering Practice" is devoted to solid systems. The main subjects discussed in the first section are crushing, grinding and methods of analysing the size of solid particles. The second section covers screening, grading and classifying, in which are included flotation, sedimentation, coal-washing and air-flow selection. There are then two chapters on the mixing of solids, and on the storage and handling of solid material. The final section of this volume contains two chapters on gas cleaning with cyclones and electro-precipitation.

These are subjects in which, in general, the main designs of equipment have come from prolonged practical experience rather than from the logical application of physical concepts. While the modern