

reader as far as covariant and intrinsic derivatives. Clearly the book is not about matrices alone but about their place in engineering mathematics and their relation to allied subjects, and the ground is prepared for a deeper study of tensors and topology. Since the book is designed for self-study there are many exercises and at the end of each chapter a set of problems for the reader to solve. There is also a good bibliography designed to guide readers with their further reading in the allied subjects and the applications.

In a disarming introduction, Mr. Braae disclaims any attempt at rigorous treatment, but in fact the treatment is more rigorous than electrical engineers need and willingly accept. The matter is presented so concisely that much ground is covered in the 160 pages of text. Yet the style is remarkably fluent and pleasant. It is certain that the author has a deep affection for mathematics. To him it is not just an engineering tool but a joy, and he seeks to arouse in his readers his own enthusiasm for a fascinating subject. His book can be warmly recommended to all electrical engineers.

W. J. GIBBS

NON-AQUEOUS SOLUBILITIES

Solubilities of Inorganic and Organic Compounds

Edited by Prof. H. Stephen and Dr. T. Stephen. Vol. 1: Binary Systems, Part 2. Pp. viii+963-1933. (London and New York: Pergamon Press, 1963.) 250s. net.

THIS book is the English edition of a compilation of solubilities prepared under the direction of a panel of scientists appointed by the Soviet Academy of Sciences. It deals with non-aqueous binary mixtures and completes the first volume of a larger work, which will ultimately include ternary and multicomponent systems. It is a useful collection of data which is well arranged, for the most part in a tabular form, although graphical presentation of data is occasionally used. Molecular formulae and name indexes for the whole of the first volume are provided and these are easy to use and enable the information to be readily located. Nomenclature is said to follow the recommendations of the International Union of Pure and Applied Chemistry and the indexing arrangement to be that of *Chemical Abstracts*.

This last-mentioned claim is not entirely true, in that elements in the inorganic section of the formula index are arranged by order of Periodic classification and not alphabetically. In addition to being indexed by name and by formula, the solubility tables are arranged according to the chemical formula of the component with the smaller number of carbon atoms. There are nearly 3,000 tables of solubilities in all and each table is provided with a reference to the original work from which the data were obtained. It is apparent from these references, of which there are more than 2,000, that the literature has been widely surveyed. The references to Russian literature are conveniently numbered 1-208. An examination of the references themselves is not without interest and reveals that about a third of them relate to work completed in 1914 or earlier. The very oldest reference is indeed old; it is a reference to the work of Gay-Lussac and is dated 1819. In contrast, only about one-tenth of the references relate to work completed since 1945. This is, of course, no criticism of the authors, who can only collect information from available sources, but when one considers the prodigious number of new compounds isolated or synthesized since 1945, this paucity of information on such a mundane property as solubility seems almost unbelievable and surely reflects an unsatisfactory situation.

On the debit side of this book, there are a number of omissions and misprints which although minor in themselves should not appear in a reference work and especially one at this price.

There are also some untranslated Russian words such as trace, insoluble, completely miscible, components, etc. These occur mostly in tables of figures and their presence is so obvious that it is difficult to see how they were missed during all the stages of preparation. Certain entries in the book relate to compounds existing in isomeric forms, and the nature of the isomer or mixture of isomers is not specified. Reference to the original journals, which were by no means readily accessible in all examples, revealed that in some cases additional information was available.

No doubt in the first edition of a work translated from Russian, errors can more easily occur than in other works. One hopes, however, that in future editions the various mistakes will be eliminated so as not to detract from an otherwise valuable collection.

The book will obviously not appeal to individuals, but it should prove a useful reference work for the library.

P. J. COOPER

TECHNOLOGY FOR SCHOOLS

Technology

Man remakes his World. Editorial Board: Dr. J. Bronowski, Sir Gerald Barry, James Fisher and Sir Julian Huxley. (The Macdonald Illustrated Library, Vol. 5.) Illustrated and designed by Hans Erni. Pp. 367. (London: Macdonald and Co. (Publishers), Ltd., 1963.) 55s. net.

THIS is a solid and well-produced book, worthy of the Verona printers who made it. In it are presented, in American style in two page units, the achievements of modern technology. The field which it ploughs is wide, even if the furrows are not deep. It is difficult to think of a technological subject which is not mentioned and illustrated in the book. It is an exciting book, and no doubt much of it will be relevant in five years time.

Technology is the fifth volume of a library of knowledge "for the family". It can be used as an encyclopaedia or a background book for a fifth- or sixth-form pupil. To the older student of science it might be useful as a book of applications of his fundamental principles. The arts student should find it useful because it tells him of the forces which, whether he likes it or not, are shaping his environment. The illustrations, of which many are in colour, are of high quality and would make good teaching aids.

Apart from the possibility of the destruction of man by the atomic bomb, the tone of the book is optimistic. "Our planet," says the book, "will become what the British poet, William Blake, called 'a green and pleasant land'. Those who feel the need for a more exciting life will find it as pioneers and developers of the other planets in the solar system." The realistic critic, not to say the cynic, may feel that there are few signs of this at present. Perhaps it is not the fault of technology that it deals with means rather than ends, with techniques rather than values; but one might pause before this catalogue of human ingenuity and ponder on the increasing slaughter on the roads and of cancer of the lung, on high wages, leisure and adolescent crime, the starvation of a large part of the world, the transistor-set and noise nuisances, and the insidious tendencies to the erosion of human individuality, as a start.

It is understandable that the sales of this book will be greater in the United States than in Britain, but it is a pity that the English reader has to endure such spellings as "sulfa", "aluminum", "fiber", "center" and so on. Since communication theory is one of the subjects of the book, an intelligent sixth-former might ask why a common use of English for scientific communication in English speaking countries is not yet vouchsafed us!

W. L. SUMNER