

are dealt with in Chapter 5, and work by Jackson, by Akhiezer and by Bernstein is included. Chapter 6 is concerned with converse theorems, and includes a good deal of the work of Prof. Timan himself on the constructive characteristics of some classes of functions. Continuing with the theme of relating best approximation of functions with their structural properties, Chapter 7 presents a number of results under this heading. The classes of functions include simple functions with singularities and functions which have a discontinuous derivative of bounded variation. In Chapter 8, the final chapter, linear processes of approximation by polynomials are discussed.

The mathematician who is not a specialist in the field of investigation of this book may be inclined to think that the mathematics of approximation deals with fairly practical problems in a fairly practical way. Certainly this is what one would hope for from a numerical point of view and from the point of view of utilizing electronic computers. But a glance at Prof. Timan's book will dispel this notion. The book is as advanced and as deep as any other on the theory of functions of a real variable. What is perhaps a little surprising is that it is so theoretical and so lacking in contact with ideas of numerical analysis. Historically it is not difficult to see how this has arisen. The subject takes its roots well back in the nineteenth century, and even the intensive Russian work of the past two decades or more had been undertaken largely before the advent of the electronic computer. Of course, a more practical approach to approximation is also being undertaken, largely by those connected with computing laboratories. But the present time would seem to be too early to expect the theory and practice of approximation to have had any very great impact on each other.

The book is written in a fairly condensed form, and the student is likely to have difficulty with the exposition unless he is acting very much under the guidance of a master. Nevertheless, for the specialist the book will be most valuable, especially in this English translation by J. Berry, in that it brings together a great deal of previously scattered material and interrelates the various parts. Another valuable feature is the 19-page bibliography of memoirs and books.

L. S. GODDARD

KINETICS OF GAS REACTIONS

Advances in the Kinetics of Homogeneous Gas Reactions
By Prof. Z. G. Szabó. Translated by K. J. Ivin. Pp. xiv + 277. (London: Methuen and Co., Ltd., 1964.) 48s. net.

THIS book provides a lucid guide to research carried out between 1938 and 1962 on the kinetics of thermal gas-phase reactions other than oxidations. The first edition was published (in German) in 1961, but additional material and references to the end of 1962 have been incorporated in the translation. The book is divided into a general part and an experimental part. However, with the exception of Chapter 2, in which the kinetic equations for many types of complex concurrent, reversible, and consecutive reactions are summarized, the emphasis throughout is on information obtained from experiments. The theories of elementary reactions are mentioned only briefly, with extensive reference to more detailed expositions, to provide the basis for chapters in the General Part and for later discussions of experimental results. Thus Chapter 3, on the kinetic significance of energy transfer, examines and tabulates the relative efficiencies of 'third bodies' in various recombination reactions, and mentions some work on reactions of excited species; Chapter 4, on problems of chemical reaction rates, summarizes the methods available for estimating activation energies and pre-exponential factors of different

types of reaction, and describes the related measurement and calculation of bond dissociation energies and the use of entropies of activation; Chapter 5, on the influence of other factors on the reaction rate, briefly indicates mechanisms of chemical catalysis and inhibition and the influence of surface reactions (rather paradoxically, many surface effects quoted here are from oxidation reactions). The sixth chapter on recent experimental methods is rather startlingly brief, but some other methods (for example, flash photolysis and the toluene carrier technique) are mentioned in other sections.

The second and principal part of the book is divided into four chapters, in which the results of experimental work on the principal gas-phase decomposition, combination or substitution reactions investigated by 1962 are discussed in clear and concise fashion. Any scheme for the extensive discussion of complex reactions where molecular, free-radical non-chain, and chain mechanisms often proceed simultaneously must produce some repetition and, at the same time, separate reactions which from some points of view could well be discussed together. In the scheme adopted in this book, Chapter 7 is devoted to decomposition, isomerization, exchange and association reactions of a single molecular reactant, and so includes all the mechanisms mentioned above; Chapter 8 deals with reactions of two or more molecular reactants, again including molecular and free radical mechanisms. Consequently, it is something of a surprise to find that a long chapter (the ninth) on the formation, unimolecular decomposition, combination and disproportionation of radicals, and on radical-molecule reactions, produces relatively little overlap of topics with earlier chapters. This is probably because what is known about the mechanism of each reaction has been discussed succinctly but thoroughly the first time the reaction is mentioned, without turning radical mechanisms into something mysterious to be postponed until later. The final chapter, on the catalysis and inhibition of homogeneous gas reactions, is brief, and in several parts—for example, the effect of NO on thermal decompositions—extends introductory discussions in earlier sections. At the end of each chapter some reactions are listed which might have been included there, but are in fact dealt with in some other chapter.

The author and the translator are to be congratulated on the pleasant style of the English translation which has given us an interesting, as well as a useful, book.

P. G. ASHMORE

RADIATION AND HEALTH

Radiation and Health

By Prof. W. V. Mayneord. (The Rock Carling Fellowship, 1964.) Pp. 140. (London: The Nuffield Provincial Hospitals Trust, 1964.) 5s.

ALMOST from the beginnings of the subject, Sir Ernest Rock Carling played a leading part in the work of national bodies and of the International Commission on Radiological Protection, of which he was chairman for many years. When he died in 1960 at the age of eighty-three, he was the 'grand old man' of radiological protection. It is most fitting that Prof. Mayneord, a great admirer and personal friend of Sir Ernest, should be invited to write the third of the monographs which have been instituted in his memory.

Prof. Mayneord is a world authority on radiological protection and during recent years has turned his interests particularly towards the radiation we receive from our environment and our food. Ionizing radiation is playing an increasingly greater part in our lives. X-rays and radioactive materials used in medicine, in scientific research and in industry are all adding to the dose we receive. There is considerable concern over the consequences of test explosions of nuclear weapons and their