

Immunochemistry

Advanced Immunochemistry. By Eugene D. Day. Pp. xvi+447. (Williams and Wilkins: Baltimore, Maryland, 1972.) \$19.

As suggested by the title, some prior knowledge of immunology is required to appreciate this book fully. The first half of the book deals with the structure of antibodies under four headings—"Light Chains of Immunoglobulins", "Heavy Chains of Immunoglobulins", "Sizes and Shapes of the Immunoglobulins" and "The Antibody Binding Site". In each chapter the past work (particularly from the 1950s-1960s) is introduced and leads to our present state of knowledge (and problems). The second half of the book deals with the reactions of antibodies. Besides the expected applications of law of mass action to reactions of antibodies with haptens and multivalent antigens, there is a very well written and concise chapter on the active centres of multivalent antigens.

Obviously a book bearing this title and running for only 401 pages (exclusive of index) will leave out certain aspects of the subject. The author has pre-empted the words of the critic, however, by mentioning most of these in the last chapter. The first half of the book deserves unqualified approval for its concise and logical presentation of our knowledge up to about the beginning of 1971. It will be very welcome for final degree students specializing in immunology, for people who want their immunological knowledge brought up to date, and of course for PhD students for its review of the development of the various topics. The second half is not so impressive simply because most of the information is available in other books and the information it contains has been around for a longer period of time. But apart from a spelling mistake on page 391, it is a useful review of the subject.

C. A. KING

Sequencing RNA

Determination of Sequences in RNA. By G. G. Brownlee. (Laboratory Techniques in Biochemistry and Molecular Biology, Volume 3, Part I.) Pp. 265. Edited by T. S. Work and E. Work. (North-Holland: Amsterdam, 1972.) £13.30.

Nucleic Acid Sequence Analysis. By Stanley Mandel. Pp. 282. (Columbia University: New York and London, February 1973.) £7.

In recent years great progress has been made in the field of nucleic acid sequencing. Besides the two classical techniques which opened the way to such studies, DEAE chromatography and the fingerprinting method, there are now many modifications in use for

investigating large RNA molecules. New approaches have also been introduced, based on copying *in vitro* RNA or DNA and combining the former analytical techniques with nearest neighbour determination and with kinetic analysis of synchronously synthesized fragments of RNA. The number of RNAs with at least partially known sequences is ever increasing and promising attempts have been made also to apply sequencing techniques to some DNA molecules. A comprehensive review in this field has indeed been needed for a long time and can be expected to be very helpful both to scientists familiar with some aspects of these problems and to those intending to start now nucleotide sequence analysis. It is therefore very welcome that two monographs on RNA sequencing have been published at approximately the same time.

Brownlee's book deals mainly with the two classical methods, Holley's column chromatography and Sanger's fingerprinting technique, and mentions briefly some new approaches involving *in vitro* labelling of RNAs. After a short introduction, he describes in detail the enzymic digestion and chromatographic fractionation techniques used in studying the structure of non-radioactive RNAs and the analytical methods for establishing the structure of the digestion products. Chapters 3-6 give a very comprehensive description of the fingerprinting technique, including technical details, alternative methods, diagrams showing the electrophoretic mobilities of different oligonucleotides and their degradation products. Chapter 5 is perhaps a too lengthy presentation of the sequencing of 5S RNA but it discusses also many modifications of the original technique and gives a useful illustration of the practical application of different analytical methods. Chapters 7 and 8 deal with some special problems, like minor bases and terminal sequences, while chapter 9 summarizes briefly some more recent methods involving *in vitro* labelling of RNAs.

Throughout the work the practical side of the problems is emphasized, and results are discussed only as far as they facilitate the understanding of the methods used. In addition, there is a very useful appendix, giving further details about the exact conditions for labelling, isolating, fractionating, digesting RNAs, mentioning even the suppliers of equipment, enzyme preparations and other special chemicals used. The book is certainly a very useful manual, enabling the reader to set up a suitably equipped laboratory and start sequence studies on RNA.

The intentions of Mandel's book seem different. He reviews a much wider field of sequence work, covering

at least the principles of almost all techniques ever used for partial or total sequence determination. He even includes early approaches which had rather limited use and a chapter on physical methods which are at present not suited for sequence studies but might be further developed and possibly used in the future for such purposes. The first nine chapters describe the principle and occasionally also some practical details of all the sequencing methods applied to RNA; chapters 10 and 11 give practical description of several techniques used in RNA research, from isolation techniques of RNA to analysis of some small degradation products. The choice of techniques presented in this latter part is not very fortunate: some simple, widely known procedures are described in detail while some specialized techniques are mentioned rather briefly. The last chapter summarizes the results of RNA sequencing: the structures of a great number of RNAs, as known today, are shown.

As the first review covering this whole field the book is certainly of considerable interest. It is not very well suited, however, to be used as a manual or as a guide to find the best technique for a particular sequencing problem. This is partly because the practical information is sometimes insufficient, partly because different methods are not always critically compared and evaluated with respect to their application to different problems.

M. SZEKELY

Inorganic Systems

The Constitution of Inorganic Compounds: Atomic Quantum Mechanics—Metals and Intermetallic Compounds. By John L. T. Waugh. Pp. xv+797. (Wiley: New York and London, August 1972.) £12.50.

This is an immense book, but it is only the first of two volumes devoted to inorganic molecules and solids. This first volume concentrates on the fundamentals of quantum theory, so that by page 797 the reader has just been prepared for a subsequent study of inorganic systems. It is a pity that both volumes could not have been published simultaneously, for one could then see more clearly the rationale of the choices of topic in volume 1.

In brief the author presupposes no prior knowledge of quantum theory. He introduces it from scratch, developing the general principles of the wave equation, operators, mean values, particle-in-a-box, hydrogen atom, and so on, following rather standard analysis. There follow chapters on variation and perturbation methods, spin, and atomic structure. By now we are at page 379 and halfway through the book. The second half is devoted to the metallic