Book Reviews

NMR Spectroscopy—An Introduction. By H. Günther (University of Siegen, West Germany). Translated by R. W. Gleason (Middlebury College). John Wiley & Sons, Inc., New York. 1980. xiv 436 pp. $62.00 (paperback $22.00).

This English translation of the revised German text is an above-average introduction to NMR spectroscopy of organic compounds. Proton magnetic resonance spectroscopy is emphasized throughout, with the exception of a chapter on carbon-13 and fluorine-19 spectroscopy. Other chapters deal with analysis of spectra, CW NMR spectroscopy, pulse FT NMR spectroscopy (considerably expanded from the original German edition), dynamic NMR spectroscopy, and advanced techniques such as double resonance methods and CIDNP. The sections which deal with assignments in high-resolution spectra in multi-spin systems and influences of molecular symmetry on spectra are particularly clear and well-written. Two-color illustrations throughout the text emphasize important points and label particular nuclei of molecules under discussion. There are exercises for the reader in each chapter, with answers in the back of the text.

This text will be useful for advanced undergraduate and graduate students in courses on organic structure elucidation and in research as a basic reference.

Louis Messerle, *University of Michigan*

The Pharmacological Basis of Therapeutics. 6th Edition. By A. G. Goodman (University of Virginia), L. S. Goodman (University of Utah), and A. Gilman (Yeshiva University). MacMillan Publishing Co., New York. 1980. xvi + 1843 pp. $45.00.

This is the 6th edition of the classic medical school textbook for pharmacology. Since its first edition in 1940, the objective of the authors, now editors, has been to correlate pharmacology with related medical sciences, describe the actions and uses of drugs in medicine, and emphasize the application of pharmaco-dynamics to therapeutics. This current edition is composed of 70 chapters within 17 sections prepared by 55 contributors. While the sectional divisions are similar to those of previous editions with the addition of Drug Therapy of Inflammation and Toxicology, the material within most chapters, however, has been substantially revised and updated. Two new appendices have been added concerning drug interactions and pharmacokinetic data on widely used drugs.

While it is hard to generalize a multiauthored text such as this, the approach taken is to first present a short overview of a physiological process or disease. Then drugs, usually a prototype or the most commonly used drugs, are sequentially discussed in terms of mechanism of action, pharmacological properties or effects on various systems, metabolism, absorption and distribution, side effects, toxicological concerns, and drug interactions. While the structure of each drug is usually provided, only brief if any attention is paid to their chemical properties. Some of the information is presented in fine print; however, the rationale for any particular section being in large or small print is not entirely clear and detracts somewhat from the presentation.

It is remarkable that in spite of the size of this book, a concise review to most areas of pharmacologic concern is provided. Previous editions of this book have been widely used as the medical school pharmacology text in the United States as well as in many other countries of the world. This edition represents a significant improvement in content as well as coverage of this fast growing discipline and should be a valuable reference tool for students, physicians, educators, and many in basic medical research.

Robert C. Murphy, *University of Colorado School of Medicine*

Design of Industrial Catalysts. By D. L. Trimm (The University of New South Wales). Elsevier Scientific Publishing Company, Amsterdam and New York. 1980. xii + 314 pp. $61.00.

This book represents a first attempt to set up a framework for a systematic design of industrial catalysts with emphasis on heterogeneous catalysis.

In the first part of the book, the author discusses general design procedures taking into account both theoretical concepts of adsorption and chemical bonding as well as experimentally observed activity patterns. The role of secondary components in alloy or metal cluster catalysts and in metal oxide solid solutions is reviewed, and guidelines for choosing support materials are proposed. A brief review of methods for catalyst testing is included.

The second half of the book gives specific examples of catalyst design for typical catalytic reactions: olefin conversion to aromatics, steam reforming, conversion of butene to maleic anhydride, conversion of benzaldehyde to benzyl alcohol, methanol production, hydrogenation of acetylene, formation of terpenes, methanation, and reduction of nitrogen oxides. The author comments on positive and negative aspects of the attempted designs in the light of the criteria developed in the first part of the book, and includes a list of references in each chapter.

In view of the complexity of the subject and the interdisciplinary approach required for any systematic attempt to design a catalyst, some of the material covered in this book is by necessity sketchy and reflects the personal preferences and opinions of the author. All in all, Trimm's book represents stimulating and interesting reading material for people actively engaged in catalytic research and proves that catalyst design has definitely left the realm of "alchemy" and is on its way toward an exact science.

Johannes Schwank, *The University of Michigan*

Magnetic Resonance in Biology. Volume 1. Edited by Jack S. Cohen (National Institutes of Health). John Wiley & Sons, New York. 1980. xiii + 309 pp. $32.00.

The editorial aim of this series is to have experts in the field present applications of magnetic resonance methods to biological systems "in a format that is comprehensible to the nonexpert". This aim is very well met in the first volume, in which seven authors review six topics involving NMR methods.

Chapter 1 (Robert E. London) discusses nuclear magnetic relaxation measurements as probes of intramolecular dynamics of proteins and peptides. Separate sections describe motional models (free internal diffusion, restricted amplitude internal diffusion, multiple internal rotations) and their applications to the polypeptide backbone, aliphatic, aromatic, and proline residues. In Chapter 2, David I. Hoult presents a highly readable, well-illustrated account of medical imaging by NMR which includes discussions of the technical constraints and safety of NMR imaging. Chapter 3 (Gerald Zon) describes NMR studies related to drug metabolism and the mechanics of drug action with emphasis of dynamic interactions. Among the classes of drugs discussed are alkylating agents, platinum compounds, and intercalators with additional sections devoted to conformational aspects of drug activity and interactions of drugs with membranes, enzymes, plasma proteins, and metal ions. The authors of Chapter 4 (Brian D. Sykes and Joel H. Weiner) describe both procedures in the biosynthesis of fluorine-labeled proteins and their ^{19}F NMR spectra. This chapter also contains a partial list of ^{19}F-labeled proteins with known NMR spectra. Chapter 5 (William Egan) illustrates the usefulness of ^{13}C NMR spectroscopy to the structural investigation of polysaccharide antigens. Starting with the general characteristics of ^{13}C NMR spectra of sugars and polysaccharides, the author describes in detail structural studies of several specific bacterial types. In the final chapter, Martin P. Schweizer reviews NMR studies of solution structure, conformation and interaction of oligonucleotides, transfer RNA, and high molecular weight nucleic acids and their complexes. The discussion of transfer RNA studies was somewhat confusing owing to the discrepancy in chemical shift values referred to in the text compared to the figures (example, Figure 6).

This volume is an excellent addition to the literature. Each of its chapters is successful in conveying to the reader both the excitement and utility of NMR methods.

Romita Sen, *The University of Michigan*