REVIEWS

Essentials of Drug Product Quality: Concepts and Methodology. By MAHMOUD M. ABDEL-MONEM and JAMES G. HENKEL. C. V. Mosby, 11830 Westline Industrial Drive, St. Louis, MO 63141. 1978. 274 pp. 20 × 25 cm. Price $14.95.

This text, according to the preface, is designed for first professional year pharmacy students. It is unique in two respects: (*a*) it attempts to integrate the elements of quality assurance of drugs and drug products with the accompanying methodology (directed toward both the drug product and the drug in biological fluid); and (*b*) it employs a format and style designed to support the use of the personalized system of instruction (PSI). PSI is described as "characterized by a mastery learning requirement, student self-pacing within the course, the use of proctors for immediate grading of tests taken by students for each unit (chapter), and infrequent lectures." Nevertheless, the format should lend itself well to a more traditional mode of instruction. In this regard, each of the 21 chapters begins with a list of performance objectives for the student and closes with a more than ample list of study questions and practice problems. The writing generally is very readable and lucid.

The first three chapters provide a well-planned, coherent treatment of the principles of drug product selection and include an introduction to dosage forms, the history and purpose of the official compendia, the role played by the FDA in drug product quality assurance, and drug product selection based on pharmaceutical equivalence and bioequivalence. However, some instructors may desire more depth in the treatment of dosage forms and bioequivalence. The treatment of the basis, application, and interpretation of official tests for unit-to-unit variation and uniformity (Chapter 2) is especially well done. However, the few sentences devoted to the dissolution test in Chapter 3 are incomplete and superficial. Chapters 4 and 5, which discuss data analysis and significance testing, are especially noteworthy.

The preface suggests that the analytical methodology chosen to be discussed (Chapters 6–20) is that supporting the quality assurance of drugs and states that the "important analytical methods" are covered. This philosophy apparently influenced the selection of topics, which include ionic equilibria (K_{sp} and acid–base chemistry) (two chapters), solvent extraction principles (one chapter), gravimetric analysis (one chapter), volumetric analysis (acid–base and redox) (two chapters), spectrometry (UV, colorimetry, IR, fluorescence, and mass spectrometry) (five chapters), chromatography (column, TLC, GLC, and HPLC) (three chapters), and radioactivity (one chapter). The emphasis is on the analysis of organic drugs and less on inorganic substances, as evidenced by the absence of precipitation and complexometric titrations among the volumetric techniques discussed and the omission of the analysis of heavy-metal ions among the gravimetric techniques. Also, electrochemical techniques are ignored, although cursory consideration is given to redox potentials in the section on redox titrations and potentiometric end-point determination is referred to in some examples of titrimetric analysis.

Each subject begins with a review of chemical principles at an elementary, general chemistry level. However, the scope often is limited. For example, amphiprotic salts and polyprotic acids are not dealt with in the chapter on acid–base equilibria, the use of acid–base titrimetry in the analysis of esters by saponification is discussed but a related application to the acylation of alcohols is not, and although chemically bonded stationary phases in HPLC are considered, formal allusion to reversed-phase methodology, one of the fastest growing techniques applied to drug analysis, is absent. However, the chapters on spectrometric and chromatographic methods are particularly well presented and provide the best depth of coverage of any of the topics discussed.

Among the most useful components of the chapters on methodology are the examples given to illustrate the principles. These examples, taken primarily from USP XIX and NF XIV, form an essential part of the textual material of the chapter since, in many cases, information or methodology may be presented here that is not dealt with in the main part of the chapter. Similar examples from the compendia also are offered as problems in the study guide found at the end of each chapter.

Chapter 21 deals with the use of the scientific literature and is followed by an appendix reviewing elementary mathematical operations (significant figures, exponents, powers, roots, and logarithms).

In summary, this is a generally well-written and well-designed text that uniquely incorporates principles of drug product selection, quality assurance, and analytical methodology. As such, the text could find application in a modern pharmacy curriculum; however, supplementation may be needed in certain areas. The major portion of the text provides a survey at the elementary level of certain methodology applied to the analysis of organic drugs. For more detailed and more comprehensive coverage of these topics, one of the more standard texts in pharmaceutical or analytical chemistry may be more appropriate.

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The Basis of Medicinal Chemistry: Burger's Medicinal Chemistry, 4th Ed., Part I. Edited by MANFRED E. WOLFF. Wiley, 605 Third Ave., New York, NY 10016. 1980. 497 pp. 17 × 25 cm. Price $29.50.

Part I is the first of a three-volume work containing 12 chapters. This multiauthored text presents underlying principles of medicinal chemistry and includes new areas and topics representing the changes in the pharmaceutical sciences since the last edition. The authors, chosen by the editor, are considered to be authorities in their field. The topics are reminiscent of those in the "Principles of Drug Action: The Basis of Pharmacology, 2nd ed.," by A. Goldstein, L. Aronow, and S. M. Kalman.

The 12 subjects covering 478 pages in this volume were selected apparently on the basis of their broad appeal. They include an introductory chapter dealing with a historical account of medicinal chemistry; one chapter on Drug Absorption, Distribution, and Elimination; two chapters on metabolism, Drug Biotransformation—Oxidation, Reduction, Hydrolytic and Conjugation Reactions and Chemical and Biological Factors Influencing Drug Biotransformation; three chapters based on drug–receptor interactions, Receptor Theories and Dose–Response Relationships, Drug–Receptor Geometry, and The Nature of the Drug–Receptor Bond; three chapters on the methods of drug design, Guidelines for Drug and Analog Design, Approaches to the Rational Design of Enzyme Inhibitors, and QSAR; and two chapters covering Drug Allergy and Chemical Carcinogenesis. The chapters on metabolism, drug–receptor interactions, and drug design were particularly interesting.

With well-written chapters, a thorough and updated literature coverage in most chapters (3451 references of which 1337 are in the introductory chapter) for further investigation, and a comprehensive subject index, this book accomplishes its purpose as a secondary source for the biologist and medicinal chemist in industry and academia. This text can be recommended as a useful reference to graduate students for an advanced course in medicinal chemistry and other disciplines (biochemistry, pharmacology, biophysics, microbiology, and bio-organic). Most researchers in these areas will find this book to be a useful addition to their library.

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Handbook of Basic Pharmacokinetics, 2nd ed. By WOLFGANG A. RITSCHEL. Drug Intelligence Publications, Hamilton, IL 62341. 1980. 454 pp. 11 × 19 cm. Price $19.50.

The author views this book not as a textbook but rather as a collection of pharmacokinetic facts. The book meets this definition well. It is a comprehensive collection of important facts necessary to the understanding of pharmacokinetics.

This edition has new sections on dosage adjustment in the elderly and

the obese and physiological and pathological factors that influence drug response. A section on correlating clinical response with drug disposition has been added. There also is a new chapter on bioavailability and bioequivalence.

Definitions are presented as a glossary in the first chapter. The processes of liberation, absorption, distribution, metabolism, and elimination are described in Chapter 2. Histological features of organs and cell membranes and drug–receptor interactions are considered in Chapters 3–5.

Absorption mechanisms (Chapter 6), physicochemical principles, including pKa values and partition coefficients (Chapters 7–9), and a physiological discussion of the GI tract and the circulatory system (Chapters 10 and 11) are presented.

Protein binding (Chapter 12), drug metabolism (Chapter 13), and drug elimination (Chapter 14) are mentioned, and drug reabsorption in the kidneys and biliary recycling are presented in Chapter 15.

The next section of the book (Chapters 16–26) deals with mathematical descriptions of various compartmental models. Included are one- and two-compartment models with intravenous and oral dosing. The determination of rate constants by noncomputer techniques is included with a discussion of volumes of distribution. Concentrations after single and multiple doses are calculated. Methods for calculating and using the area under the curve and urine data are presented. Dosage adjustment for children, elderly, and obese patients are presented, as are methods used to calculate dosage regimens for desired results.

The final chapters of the book (Chapters 27–31) deal with the effect of physiological factors on drug response and disposition, nonlinear pharmacokinetics, curve fitting, clinical response correlations with disposition, and bioavailability and bioequivalence. The appendix gives 14 pages of pharmacokinetic information for various drugs.

This book covers many of the topics discussed in an undergraduate biopharmaceutics course and of interest to a clinical pharmacist. Each topic is covered briefly but comprehensively. Both students and practicing pharmacists should find this book to be a very useful aid in understanding and using pharmacokinetic principles.

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Pharmaceutical Dosage Forms: Tablets Vol. 1. Edited by HERBERT A. LIEBERMAN and LEON LACHMAN. Dekker, 270 Madison Ave., New York, NY 10016. 1980. 490 pp. 18 × 25.5 cm. Price $59.75. (A special introductory price of $29.75 is available on orders of five or more copies in the United States and Canada.)

This book is the first in a three-volume treatise designed to examine in detail all phases of tablet technology, from initial development to final quality assurance. In the first volume, each chapter develops from an introduction through to the present pharmaceutical practice. Fourteen authors contributed to this first volume of eight chapters, and they, along with those listed for the other two volumes, represent an illustrious selection of experts in this area.

Chapter I, entitled Preformulating Testing, is an excellent review of all the physical pharmacy testing necessary to characterize a new drug substance. Three excellent case studies are presented. The second chapter, entitled Tablet Formulation and Design, demonstrates how a suitable drug formulation should be developed based on available preformulation knowledge. Compressed Tablets comprises Chapter III in which each unit process step is reviewed, and the advantages and disadvantages of the techniques and excipients available are discussed in detail.

The final five chapters are entitled Compression-Coated and Layer Tablets; Effervescent Tablets; Special Tablets: Sublingual and Buccal Tablets; Chewable Tablets; and Medicated Lozenges. For each, the processing steps and alternatives are reviewed along with details of typical formulations.

The remaining two volumes promise to discuss each unit process in detail. Each chapter in Volume 1 is, however, complete within itself. When publication is completed, this series will be considered as the definitive state of the art. If, as the title implies, further volumes on capsules, liquids, and semisolids follow, this series will become the encyclopedia of pharmaceutical technology. Anyone actively involved in tablet formulation will require access to this series. However, anyone involved in formulation development or evaluation will also find this series to be of great value. It deserves to be the definitive reference for academic use.

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Drug Level Monitoring—Analytical Techniques, Metabolism, and Pharmacokinetics. By WOLFGANG SADÉE and GEERTRUIDA C. M. BEELEN. Wiley, 605 Third Ave., New York, NY 10016. 495 pp. 15 × 23 cm. Price $35.00.

This book is divided into essentially two parts. The first part consists of brief, generalized chapters on drug metabolism, pharmacokinetics, clinical pharmacokinetics and therapeutic drug level monitoring, and analytical techniques. Of these four chapters, the work on analytical techniques is the most extensive.

The second section consists of drug monographs for 102 drugs which were chosen on the basis of being currently measured in clinical pharmacokinetic laboratories, being representative of a class of chemical or pharmacological agents, and/or belonging to the following major classes: antimicrobials, anticancer drugs, antiepileptics, cardiovascular drugs, psychotropic drugs, analgesics, and drugs of abuse. Each monograph contains a brief description of the therapeutic and toxic concentration ranges, metabolism, analogous compounds, and analytical techniques. The last section of each monograph briefly describes the various analytical methods (with pertinent references) that have been employed. References in this section are current to 1978. However, an addendum at the end of the book updates the references through October 1979.

The chapters that appear in the first part of this book are far too brief and cursory to be of value to anyone unfamiliar with the given area. Two pages on the topic of pharmacokinetics is hardly worth the effort. In addition, the treatment of the various analytical techniques is quite unbalanced. Spectroscopic methods such as UV and visible spectroscopy, colorimetry, and fluorescence are given as much coverage as high-performance liquid chromatography, although the latter method is of much greater utility in monitoring blood levels of drugs. Greater coverage of the more important methods at the expense of the less important ones might have been a better approach.

The section containing drug monographs provides a wealth of information and important references. In most cases, some details are given on the most suitable methods.

Despite the shortcomings of the initial chapters, this book will be valuable to anyone engaged in drug level monitoring. Since the book provides a good survey of the pertinent literature, it can serve as an excellent starting point in searching for the best assay for a given drug level monitoring project.

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Clinical Pharmacology, 24th ed. Edited by RONALD H. GIRWOOD. Macmillan, 866 Third Ave., New York, NY 10022. 1980. 608 pp. 15 × 23 cm. Price $29.95.

First published in 1884 in Great Britain, *Clinical Pharmacology* appears to be designed to acquaint medical and paramedical professionals with a relatively complete compilation of currently used drugs. Following two chapters devoted to discussions of Mechanisms Involved in Drug Action and Adverse Drug Reactions are 16 additional chapters that address antimicrobials, analgesics, autonomic and CNS drugs, cardiovascular drugs, drugs affecting the respiratory system, drugs affecting the alimentary system, drugs acting on the kidney, endocrine drugs, vitamins, hematinics, anticoagulants, cancer chemotherapy, heavy metals, and drug treatment of skin disorders. Chapter 19, An International Guide to Proprietary Names, provides a cross-listing of generic names from the trade names of drugs marketed both in Europe and the United States.

Written by one of the six contributing authors, each chapter introduces the drug category, describes the physical or chemical characteristics of