

Book Reviews

ROBERT L. MCCARTHY. **Introduction to Health Care Delivery: A Primer for Pharmacists.** Gaithersburg, MD: Aspen Publishers, Inc., 1998. xiii + 430 pp., 10 figs. 15 tpls. \$40.00.

This text provides an excellent overview of the United States health care system with the participation of the pharmacist as a central theme. Other authors have provided insight into delivering American health care but do not consider how pharmaceutical care fits into the system. In addition, several pharmacy texts discuss the roles of pharmacists without a complete description of the health care arena. This book explains the tremendous changes in health care from the 19th century to possibilities for the future. It is divided into six sections, which make it easy to find specific information quickly.

Part I consists of one chapter that discusses the historical perspective of health care in America. This chapter provides an overview of factors important in decreased mortality rates, changes in education of health care professionals, and legislative policies that impacted hospital growth and health insurance.

The eight chapters of Part II discuss different health care delivery systems. Hospitals, ambulatory care, long term care, mental health services, and home care are included. In addition, a chapter is devoted to health care professionals and interdisciplinary care. This chapter contains excellent comparative information for various health professionals (pharmacists, physicians, nurses, and allied health professionals) as to education, types of practice, number of practitioners, and rewards. Another chapter provides insight into public health, preventive medicine, and epidemiology. Part II is completed with a chapter that discusses drug use and the pharmaceutical sector of U.S. health care. The drug approval process is described as well as consumers' use of medication.

Part III describes American health care financing. Private health insurance, Medicare, Medicaid, and managed care are discussed in four separate chapters. The impact of these changing financial mechanisms on the practice of pharmacy is included.

The two chapters in Part IV address comparative health care systems. The domestic health care chapter includes information concerning uncompensated care pools, employer mandates for insurance coverage, taxes for private insurance, Medicaid waivers like TennCare and the Oregon plan, and any-willing-provider legislation. The next chapter deals with international health care plans. Features of basic health care provided, financing, and current status of that particular system are described. Countries included are Canada, the United Kingdom, Germany, Japan, China, and Cuba.

Part V involves reform of the U.S. health system. Financing and cost containment are issues of reform as well as access to the system. Reform also includes issues of ethics and law. Further, reform touches the models of patient care. This section of the book discusses all these aspects of reform.

The future of pharmaceutical care is discussed in Part VI. First the past expansion of pharmacy is described, followed by a discussion of the present era of assessment and accountability, and then the probable era of outcomes and information management is considered.

This book offers the potential pharmacy student an excellent overview of what the pharmacist has done in the past, what the profession does at present, and what pharmacy hopes to accomplish in the future. In addition, the senior pharmacy student can get a better understanding of the overall health care system and how pharmacy can make an impact on patient care. I would recommend this book as an addition to pharmacy libraries of all students and suggest it for incorporation in courses for pharmacy administration

and introduction to pharmacy practice. Further, each chapter provides an extensive list of references for those interested in additional reading.

Kim Broedel-Zaugg
Ohio Northern University

HERBERT A. LIEBERMAN, MARTIN M. RIEGER, AND GILBERT S. BANKER. **Pharmaceutical Dosage Forms: Disperse Systems Vol. 3.** New York NY: Marcel Dekker, Inc., 1998. xviii + 559 pp., 178 figs., 95 tpls, \$165.00 (\$65.00 text).

The third volume in this series is an excellent compilation of the knowledge and expertise in the development, formulation and use of disperse dosage forms. In Part A, this particular volume focuses on specialized dispersed systems such as multiple- and micro-emulsions, liposomes, polymeric nanoparticles, Poly(lactic acid) and Poly(lacto-co-glycolic acid) nanoparticles and aqueous polymeric dispersions. For each of these specialized disperse systems, the authors provide the reader with the background and knowledge needed to understand and characterize each of these specialized disperse systems discussed in that chapter. As such, this approach does contribute to repetition of topics common to each of these disperse systems. However this repetition helps to strengthen the reader's understanding of these various topics. The figures and tables provided in the first six chapters enhance the reader's understanding of the material and could be useful for instructional purposes.

The seventh chapter in this volume can be extremely useful to individuals who are interested in the development of disperse system products, as it provides sample formulations for suspensions, solutions, emulsions, powders and creams. More importantly, the authors have provided compendial listings, ionic charges, CFR references and the trade names and suppliers for all the polymeric excipients in tabular form and in individual monographs. The presence of these individual monographs in a single source will be useful to graduate students and formulators, but may ultimately cause the text to become dated as information on the excipients changes with time.

The second part of this work discusses pragmatic areas dealing with disperse systems including equipment selection and operating techniques, scale up of disperse delivery systems, quality assurance and validation of disperse systems. In particular, Chapter 8 provides an excellent discussion about equipment selection and operating procedures. This information on equipment is followed by a useful presentation of Chapter 9 on the theoretical and practical aspects of scale-up for disperse systems. In particular, the author of this chapter has provided a useful paradigm for the scale-up procedure. Scale-up considerations for parenterally administered dispersed dosage forms are discussed in Chapter 10. Chapter 12 provides the formulator with many useful and practical approaches to including validation for cleaning, specific dosage forms, manufacturing and filling, specific physicochemical properties and experimental design.

While many of the chapters discuss specific conditions related to dispersed systems, Chapter 11 (Quality Assurance) and Chapter 13 (Drug Regulatory Affairs) are more general in nature. As such, the content in these two chapters could appear in other similar books and may be useful in the discussion of other dosage forms. These two chapters do not distract from the main subject of the book. However the current order is somewhat distracting to the work. The text might have flowed better if Chapter 11 and Chapter 12 were switched in the order of appearance. Nevertheless, these

two chapters enhance the book since it provides the reader with an appreciation of the entire subject area related to the formulation of these specialized dispersed systems.

Overall, this third volume is an important contribution to the literature on pharmaceutical dosage forms. As presented, it is best suited to use as a textbook or reference book for a first year graduate course at the masters or doctoral level. It may be a useful reference, either required or elective, for an advanced dosage form course, either required or elective, in a doctor of pharmacy program. This book will also be a useful addition for graduate students in nonpharmacy disciplines (e.g., engineering) whose work involves these dispersed systems. Therefore, it would be a useful addition to a pharmacy or general science library, particularly those who already own Volume 1 and 2 in this series.

Gayle A. Brazeau
University of Florida

ALEX GRINGAUZ. **Introduction to Medicinal Chemistry - How Drugs Act and Why.** New York: NY: Wiley-VCH, Inc., 1997. xiii + 721 pp., 221 figs., 120 this., \$89.50.

The broad interdisciplinary nature of medicinal chemistry coupled with its interface to essentially all aspects of the life sciences makes an overview of this field an extraordinary undertaking for any small group of authors, let alone a single author. Yet, Alex Gringauz has risen to the occasion. The benefits of his singular effort become immediately clear when this book is compared to the various multi-authored works that have been available for some time such as Foye's *Principles of Medicinal Chemistry*, Burger's [4 volumes on] *Medicinal Chemistry and Drug Discovery* or Hansch's *et al.* [6 volumes on] *Comprehensive Medicinal Chemistry*. Thus, like Silverman's sole effort that focuses upon just *The Organic Chemistry of Drug Design and Drug Action*, the overall cohesiveness, consistency of coverage from topic to topic and, above all, the interchapter reference relationships are all strong points within the Gringauz book. The use of a plethora of specific chemical structure examples and schemes to illustrate key points being made within the text is an additional strong point.

Alternatively, a single author can only provide one perspective and there were occasions when I thought that certain topics might have been introduced and emphasized a bit differently, such as elaborating a more thorough discussion of transition-state enzyme inhibitors before introducing mechanism-based inhibitors rather than vice versa. Likewise, in some instances the description of a general principle should have probably received a more thorough discourse, examples being that of hydrophobic bonding and certain chemical reaction mechanisms. At any rate, such weaknesses tend to be rather minor in the overall context of the work and, in addition, they can be easily addressed during lecture by a knowledgeable instructor who might want to deploy this book as a required text.

Specifically, the book is divided into 15 chapters, all of which are done at a level of depth appropriate for the undergraduate pharmacy or chemistry student. A list of suggested readings as well as a list of references accompany each chapter. The chapters include: 1) Basic Considerations of Drug Activity; 2) Mechanisms of Drug Action; 3) Drug Metabolism and Inactivation; 4) Anticancer Drugs and Their Mechanism of Action; 5) Analgetics and Nonsteroidal Antiinflammatory Agents; 6) Antimicrobial Drugs I; 7) Antimicrobial Drugs II; 8) Drugs Affecting Cholinergic Mechanisms; 9) Drugs Affecting Adrenergic Mechanisms; 10) Drugs and the Cardiovascular Diseases; 11) Drugs and the Cardiovascular Diseases II; 12) Psychoactive Drugs - Chemotherapy of the Mind; 13) Histamine Antagonists and Local Anesthetics; 14) Steroids; 15) New Developments and New Problems. A thorough index for the entire work is also provided.

It must also be noted, however, that there are numerous typos, which begin at the preface and run all the way through to the last

chapter. While a student may be able to traverse these text-based errors without jeopardizing the educational process, the equally frequent errors that occur in the structural diagrams, mechanistic schemes and in some of the equations could go by unrecognized as such and, therefore, could become problematic unless a seasoned instructor is present to further guide the student across such pitfalls. I am also compelled to clarify that esmolol should not be classified as a prodrug, the proper jargon in this case being 'soft drug.'

In conclusion, I wholeheartedly recommend this book for use as an undergraduate text as long as it is deployed by a patient, seasoned instructor in medicinal chemistry. And I most certainly look forward to the book's second edition, additionally cleaned-up after this initial exposure and appropriately updated, because the book should then be able to serve nicely as a stand-alone library reference as well as a useful instructor's tool.

Paul W. Erhardt
The University of Toledo

OLJAN REPIC. **Principles of Process Research and Chemical Development in the Pharmaceutical Industry.** East Hanover, NJ: Wiley-Interscience 1998. xvi + 213 pp., 186 figs., 39 tbls., \$74.95.

Dr. Repic's book illustrates vividly the art, creativity and science displayed in chemical development and process research in the pharmaceutical industry. As stated nicely by Dr. Thomas Blacklock in the Foreword to the book, "After all, the process to put a new drug on the market only begins with discovery. We have to put the genie in the bottle. For those of you who wish to understand how this can be done, this book is for you."

This reasonably well-written book provides the reader several examples of challenging, complex and varied problems faced in chemical development in nine chapters with such intriguing titles as "The Ideal," "Impure Thoughts," "Going All the Way," "Mirrors," "Au Naturel," and "Radiant." The topics selected reflect the strong synthetic organic and analytical chemistry knowledge-base required by the process chemist, yet provided in a fairly readable fashion that may furnish insight to and be enjoyed by a broader chemical/pharmaceutical audience.

The initial chapter utilizes two practical examples to help illustrate the author's view of "The Ideal," the basic principles of process chemistry and chemical development. "Impure Thoughts," Chapter 2, provides 20 referenced examples with necessary simplified reaction schemes that introduce the challenging task of troubleshooting impurities generated in a reaction. Chapters 3, 4 and 5 deal with stereochemical issues in one way or another. These range from the 10 year study ("Going All the Way") of a racemic HMG-CoA reductase inhibitor with diastereomeric ratio concerns that made it onto the market to various methods for resolution of enantiomers ("Resolutions") and asymmetric synthesis of pure enantiomers ("Au Naturel"). Chapter 7, "Radiant," is a brief overview to the strategy of introducing isotopic labeling into drugs to study their metabolic fate and distribution in the body.

The final two chapters differ in their focus from Chapters 1-7. Chapter 8, "License," provides a brief overview of the government regulatory process. Good manufacturing practices and validation are discussed in detail. "The Future," Chapter 9, tackles the always difficult task of speculating about the future; the future of chemical development. This very short chapter stresses the promise of monoclonal antibody technology as custom-designed catalysts for bulk chemical processes.

A strength of this moderately priced volume is that it impresses upon the reader what must be some of the pride and enjoyment experienced by working process development chemists. This is an area of the pharmaceutical industry that is little discussed in undergraduate and graduate courses. While targeted to chemists, chapter topics generally give the average reader new

to chemical development a good glimpse at the most challenging problems faced in this area.

Robert D. Sindelar
University of Mississippi

JOHN T. TURNER, CARY A. WEISMAN AND JEFFREY S. FEDAN. **The P2 Nucleotide Receptors.** Totowa NJ: Humana Press, Inc., 1998. xi + 440 pp., 52 figs., 11 tbls. \$139.00.

This book provides an overview of structure, pharmacology, and physiology of the P2 nucleotide receptors. The information is organized into five sections: a historical perspective, the pharmacology and molecular characterization of P2 nucleotide receptors, mechanisms of P2 nucleotide receptor action, physiological roles for P2 nucleotide receptors, and future vistas. The book contains 16 chapters, each written by a different individual or group that is expert in the specialty of the chapter.

Over the last several years, I have had little opportunity to delve into the area of purinergic neurotransmission. My few exposures suggested that this is a very difficult area to study because there are few if any compounds with specificity for receptors. The natural ligands have important metabolic functions in almost every tissue, and the natural ligands are very rapidly metabolized. These observations caused me to actively avoid study of purinergic neurotransmission. However, a potential research project provided me with a need to become updated on purinergic neurotransmission about the time I received the opportunity to review *The P2 Nucleotide Receptors*. My views of the book are influenced by this background.

I enjoyed the historical review. Geoffrey Burnstock provides a wonderful summary of research findings on the extracellular actions of purines. The material in this chapter provides an overview of the major discoveries as well as of the factors that complicate research in the area. The explanation of how the differing nomenclature systems developed provided a solid background that helped me manage terminology throughout the rest of the book.

For the most part, I enjoyed all of the chapters in the section on pharmacological and molecular characterization of P2 receptors. This section has chapters covering the two major classes of P2 receptors, structure activity relationships for agonists and antagonists, and receptor modeling. The comparisons of structure of cloned receptors were interesting, and the nomenclature based on structure is easy to understand. The chapter on modeling and identification of binding sites was particularly interesting in the way comparisons were made to other G-protein linked receptors (in the case of the P2Y family) and to other proteins that bind nucleotides.

The section on mechanism of P2 nucleotide receptor action covered coupling to phospholipase C pathways, to cAMP pathways, and to ligand-gated ion channels. I found the basic biochemistry interesting, but I had little enjoyment for the parts of some chapters that provided extensive comparisons of findings in a variety of tissues. I especially enjoyed the chapter on ecto-kinases, as this is a less commonly encountered topic.

The section on physiological roles for P2 receptors was my least favorite. I was hoping for more emphasis on physiology and less on structure-activity descriptions. However, the chapter on therapeutic applications for nucleotides in lung diseases was a marvelous synthesis of physiology, disease, and potential applications.

The strength of this book is that it is an excellent reference for the current status of knowledge of P2 nucleotide receptors. This is not a book that people will read for pleasure or for general interest. It will be a good addition to a pharmacy library at schools with a research emphasis. It is an excellent source of information for those

new to the area of P2 nucleotide receptors and, in my opinion, should also be a good reference for those working in the area.

Lane J. Wallace
Ohio State University

NORMAN S MILLER, Editor. **The Integration of Pharmacological and Nonpharmacological Treatments in Drug/Alcohol Addiction.** Binghamton NY: The Haworth Press, Inc. 1997. 122 pp., 6 figs., 1 tbl. \$39.95.

This textbook was co-published as Volume 16, Number 4 in the *Journal of Addictive Diseases* in 1997. While it does address a number of issues concerning the integration of pharmacological and nonpharmacological treatments of addictions, it does so in the manner of a journal rather than a cohesive textbook. A number of authors contributed to the book. The book is divided into unnumbered chapters

In an introduction chapter, Miller indicates that the scientific and treatment communities need to cooperate to reduce the morbidity and mortality of addictive diseases. The next chapter provides a simplified discussion of biological interactions in addictions, suggesting that pharmacological and nonpharmacological treatment modalities need to be integrated based on these interactions. A well-documented review of genetic and familial studies of addiction vulnerability follows.

The third chapter provides a fairly comprehensive review of studies involving pharmacotherapeutic interventions in addictive and co-morbid disorders, such as depression, psychosis, and anxiety disorders. Three figures provide treatment strategies for these disorders, unfortunately, the reader may become confused by unexplained arrows in several of the treatment "boxes." Chapter 4 reports a single study comparing methamphetamine- and cocaine-addicted cohorts from a single outpatient treatment center. Despite differences in patterns of use, treatment retention curves for both drugs were essentially identical. Since pharmacotherapeutic intervention has largely been unsuccessful in treatment of either of these addictions, the authors suggest that these response curves can serve as a "benchmark" for future pharmacotherapeutic intervention assessments.

The fifth chapter reminds the reader that pharmacotherapeutic interventions for addictions have largely been in detoxification (withdrawal) rather than in relapse prevention. The authors document the need for systematic evaluation of pharmacotherapies for addiction combined with behavioral and other psychosocial therapies, as well as the need for concurrent pharmacotherapy of co-morbid diseases. Chapter 6 continues this discussion, considering, specifically, the treatment of alcoholism in different countries. Lack of comparability of treatment methods and differing societal attitudes about drinking confounds alcoholism treatment research. The author provides a concise review of drugs used to enhance external (e.g., disulfiram) and internal (e.g., acaprosate, naltrexone) control of drinking. The chapter concludes that the combination of pharmacologic and nonpharmacologic treatments for alcoholism offer the greatest promise for reducing the necessity for inpatient treatment.

The final chapter provides a broad overview of the efforts of the National Institute on Drug Abuse (NIDA) and the National Institute on Alcoholism and Alcohol Abuse (NIAAA) to develop new medications for treating addictions and discusses confounding variables. It includes not only a concise review of medications which have been studied in treatments of opiate, alcohol and cocaine addictions but also a summary table of medications which have been or are under consideration for treatment of such substance use disorders. Pharmacotherapy of amphetamine and nicotine dependence is also briefly discussed.

The text includes a guide to a number of related reference sources; those available through online database searches are so-

noted. An index is provided.

This book would be a useful resource for the student, educator, or researcher who needs a fairly concise review of the "state-of-the-art" of pharmacologic treatment of addictions as a starting point for further reading. It is not suitable for use as a textbook, nor does it consider any of the addictions in great depth. It may be a useful resource to have in a pharmacy college library, but it should be noted that the college may already have access to this information in the previously-cited Journal of Addictive Diseases.

Jeffrey N. Baldwin
University of Nebraska

PAUL L. WOOD. **Neuroinflammation - Mechanisms and Management.** Totowa NJ: Humana Press, Inc., 1998. x + 375 pp., 53 figs., 40 tabs. \$ 145.00.

The book *Neuroinflammation: Mechanisms and Management* is truly an important piece of work. The authors describe several clinically relevant neurologic disorders, including acquired immune deficiency syndrome (AIDS) dementia, Alzheimer's disease (AD), amyotrophic lateral sclerosis (ALS), Down's syndrome, Huntington's disease, multiple sclerosis (MS), spinal cord injuries, Parkinson's disease (PD), and stroke. The authors elegantly bring together basic science and clinical practice. There is an integration of anatomy, biochemistry, immunology, and pharmacology. Introduced is a unique way of thinking about molecular targets and neuroinflammation cascades, with an emphasis on designing new pharmacological treatment for the above disease states and disorders. There are no other books quit like this one for comparison.

The authors lay down a solid foundation of basic science information. There is a thorough review and update of biochemical mediators in neuroinflammation, neurodegeneration, and the mechanisms of cell death. The important concepts are clearly defined. This salient book reviews the biochemical mediators that are potentially the cause of neuronal death, in both acute and chronic illness. Throughout the book there are complete references and constructive tables. Representative illustrations amplify the points made throughout the book.

The disease states and disorders included are well represented in *Neuroinflammation: Mechanisms and Management*. Each chapter is broken down into fundamental segments to enhance the readers learning and foundation of knowledge. A few of the chapters end with conclusions, directions for future research, or a summary which highlight the important points made in each section. The index could have referenced the clinical disease conditions individually, making it more user friendly. However, the overall format of the book is fine.

There are several interesting parts and chapters in this book, one example being Free Radicals (Part IV). One of the supporting chapters is the "Utility of the 21-Aminosteroids for Spinal Cord Injury" (Chapter 11). Currently, these agents are showing great promise in human clinical trials across the United States. In this chapter there is a nice review of animal studies that have shown efficacy, with the results clearly stated. However, as stated by the authors, more research is needed in this area to identify the basic mechanism of action of chemicals used in the scavenging of reactive oxygen species (ROS) in neurodegenerative conditions. They also believe that some antioxidants do more than scavenge the ROS induced by oxidative stress and may affect cellular signal transduction, genetic response, and inflammation.

There is also an intriguing part on Cytokines (Part III) with particular attention on IL-1 which is important in acute inflammatory responses. IL-1 is produced by monocytes and macrophages, and can be synthesized by microglial cells and astrocytes. IL-1 may be important in several disorders such as seizures, MS, stroke, head trauma, and AD. These are all common neurologic disorders that we see every day.

Microglia (Part I), Acute Phase Proteins (Part II), and Miscellaneous Mediators (Part V) are also important parts of this book. Under Miscellaneous Mediators the reader can find information on the "Inducible Cyclooxygenase (COX-2)" (Chapter 14) which are the subject for research on antiinflammatory drugs with fewer side-effects than the current nonsteroidal anti-inflammatory drugs (NSAIDS).

Neuroinflammation: Mechanisms and Management would effectively be used in schools of pharmacy to bridge the gap between neuro-pharmacology and therapeutics. The book would also enhance the libraries of schools of medicine.

Jacquelyn L Bainbridge,
University of Colorado

RONALD W. PIES. **Handbook of Essential Psychopharmacology.** Washington DC: American Psychiatric Press, Inc., 1998. xvi + 416 pp., 6 figs., 70 tabs. \$39.95.

Handbook of Essential Psychopharmacology is an excellent source of current information on psychopharmacology concepts that are encountered in daily practice. The author states that this handbook is a 'companion' to his 1994 text, *Clinical Manual of Psychiatric Diagnosis and Treatment: A Biopsychological Approach*. The target audience is identified as psychiatrists, however many clinicians will find this an informative handbook. The four major drug classes covered in thorough detail include antidepressants, antipsychotics, anxiolytics and sedative/hypnotics, and mood stabilizers.

The handbook is written in a manner that will be useful for either a novice who has an interest in psychopharmacology or the seasoned practitioner in the psychiatric pharmacy field. Four chapters covering the four major drug classes are presented. Each chapter begins with a brief review of basic psychopharmacology concepts. Extensive tables are furnished in each chapter following the psychopharmacology review. Topics covered in the tables include, but are not limited to, diagnosis, drug mechanism of action, pharmacokinetic parameters, dosage equivalencies, comparative costs of generic medications, side effects and methods of remedying the side effect, and drug interactions and the seriousness of the drug combination. The third part of each chapter is composed of a question and answer section of clinically relevant issues. The author critically evaluates current literature and incorporates some information from his own clinical practice to answer the questions that are posed. Vignettes and puzzlers round out the end of each chapter. These cases are accompanied by a discussion of 'clinical pearls' used to determine appropriate use of psychiatric medications. Each chapter is well referenced with current citations.

In an effort to determine the usefulness of this handbook for a novice, I asked my students to try out the handbook during their Psychiatry Advanced Practice Experience. The students gave a favorable review of the handbook. They stated it was small enough to carry and a useful reference to answer questions posed in a clinical psychiatry site. In addition, the cost of the handbook is reasonable.

The major drawback of this handbook is that the information contained in it will be quickly outdated since psychopharmacology knowledge is expanding rapidly. Nevertheless, major psychopharmacological concepts are clearly and concisely described in the handbook so it will continue to be an excellent resource. This handbook is recommended for clinicians who are looking for an inexpensive yet comprehensive guide to psychopharmacology.

Julie A. Cold
Mercer University

MARGIE HANSEN. **Pathophysiology: Foundations of Disease and Clinical Interventions.** Philadelphia PA: W.B. Saunders Co., 1998. xxvii + 1179 pp., 543 figs., 400 tbs. \$61.95.

As described in the preface, Dr. Hansen wanted to provide a text that would explain physiologic and pathophysiologic principles and relate them to clinical practice. It is aimed at upper-level undergraduates and beginning graduates in health-related disciplines. The first part begins with the foundations of pathophysiology, which emphasizes cellular and subcellular mechanisms. Unit One presents a theoretical perspective discussing the concepts of wellness and disease and the physiologic response to stress.

Unit Two presents a cellular perspective, describing cell structure and intracellular communication. It concisely covers membrane permeability, biologic gradients and ligand-receptor interactions. Chapter Three focuses on cellular nutrition. Electrophysiology and the mechanism of muscle contraction are covered in Chapters Four and Five. Chapter Six details genetic regulation, embryology and systemic manifestations of aging. The last chapter concludes with congenital defects and neoplasia.

Unit Three contains four chapters related to the maintenance of the cellular environment. The first covers the concepts of fluid distribution and balance followed by disorders of electrolytes and acid-base balance. The final chapter in unit three is dedicated to thermoregulation.

Part Two (and the majority) of the text is presented as an organ system approach. Unit Four contains three chapters related to the hematologic system, describing the components of the blood and their regulation, as well as the causes and manifestations of anemias, leukemias and platelet disorders. Inflammation, hypersensitivity, immunity, and the acquired immunodeficiency syndrome are described as well as disorders of hemostasis and fibrinolysis. Unit Five contains the cardiovascular system with disorders of circulation, cardiac failure and cardiac dysrhythmias. Chapters 18 and 19 comprise the respiratory system. Unit seven covers renal function and the common disorders associated with that organ system.

Unit Eight details the neurologic system. These chapters include disorders of cortical function (*i.e.*, Alzheimer's Disease, epilepsy, psychosis, stroke, etc.), disorders of somatic motor function and autonomic function (*i.e.*, cerebral palsy, multiple sclerosis, myasthenia gravis, Parkinson's Disease, etc.) and disorders of sensory function (analgesia, hearing loss, headache, glaucoma, peripheral neuropathy, vertigo and others). The gastrointestinal system is addressed in Unit Nine. The endocrine system and associated clinical disorders are detailed in Unit Ten. Unit Eleven covers male and female reproductive disorders and diseases of the breast. Pregnancy, lactation and neonatal issues follow in the unit twelve. The musculoskeletal system and disorders of the skin conclude this part of the text.

The text has several helpful appendixes. The first is a glossary of terms and the second is an extensive list of commonly used abbreviations. There is also a table of normal values for laboratory tests, including both conventional and SI units. The last appendix contains a list of practice guidelines for common medical disorders from the Agency for Health Care Policy and Research (AHCPR).

There were several features of this text that I liked. At the beginning of each chapter, the author lists specific learning objectives and key terms that will be used. Clinical scenarios or clinically relevant questions also appear in each chapter. Another unique feature is a table in each chapter entitled "focus of current research." The author identifies several recently published research studies and their findings demonstrating principles discussed in the chapter. At the end of each chapter is a summary of the key points presented as well as the list of references and an additional bibliography. The chapters dealing with specific organ systems usually begin with functional anatomy. There is liberal use of figures and tables throughout the chapters that enhance understanding. It is more clinically oriented than *Guyton's Textbook of Medical Physiology*. Faculty responsible for courses in physiology or pathophysiology should consider this book as a required text.

Jean Nappi
Medical University of South Carolina

