graphs is provided. However, failure to reference the material in the individual chapters is a serious omission.

This book may serve as a quick reference for chemical structures and chemotherapeutic properties of a large number of antibiotics. However, the handbook approach used to present the material makes this book unsuitable as a text.

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Solid-State Chemistry of Drugs. By STEPHEN R. BYRN. Academic Press, 111 Fifth Avenue, New York, NY 10003. 1982. 346 pp. 15 × 23 cm. Price $55.00.

The literature on solid-state chemistry is not abundant, and the topic of solid-state chemistry of drugs *per se* has not been treated previously in book form. (Granted, chapters in books and reviews in journals have appeared.) Dr. Byrn's book hence fills a void. It is refreshing to note, at the onset, that it does this very well.

The book is, first of all, self-contained. It commences with morphological descriptions and definitions, followed by a broad overview of what actually happens in a solid when the molecules contained in it (or some of them) undergo chemical change. It then gives examples of the various types of solid-state reactions documented in the literature (and of pharmaceutical interest).

A chapter is devoted to methods of analysis, in a somewhat different way than the casual reader might expect. The tools of trade in this field, if mechanistic understanding is the goal, are X-ray, spectroscopy, and thermal methods. In other words, the analysis section is not cluttered with specific assay methods, but rather with the specific tools. It might have been instructive to have a section dealing with high-vacuum techniques of gas analysis, since these are frequently used in solid-state kinetics in isothermal studies of gas-producing reactions.

The chapter on solid-state kinetics is excellent and covers all essential principles. Particularly useful is Table I, where one particular reaction is treated by a large number of different mechanistic models, leading to the conclusion (not surprisingly) that simply fitting the data to a model will not, in itself, serve as a selection criterion. That philosophy is true in general, but is well stated.

A large chapter is devoted to polymorphism, an important aspect not often thought of as "chemistry" (as implied in the title of the book). But, it certainly belongs in the book and should be of great usefulness to those working in this particular field.

The book contains a wealth of examples. It is written in a very pleasant style. A must for the pharmaceutical scientist involved in solid dosage forms.

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Dermatological Formulations: Percutaneous Absorption. By BRIAN W. BARRY. Marcel Dekker, 270 Madison Avenue, New York, NY 10016. 1983. 479 pp. 16 × 23.5 cm. Price $55.00 (20% higher outside the U.S. and Canada).

This is a concise, single-authored overview of percutaneous penetration as it relates to dermatological formulations. Demonstrating the breadth and depth of his personal reading and experience, Dr. Barry singlehandedly tackles many different areas. He starts with a brief overview of the structure, function, diseases, and topical treatment of human skin. The second chapter is a classical review of the principles of diffusion through membranes. He next discusses the facts and theory related to skin transport and properties influencing percutaneous absorption. Following a brief review of methods for quantitating absorption, he ends with two strong chapters on formulation and rheology of dermatological vehicles.

This book is heartily recommended for the novitiate as well as the expert. Being a personal statement, you will enjoy the author's strengths and weaknesses in terms of understanding the field. The index is unique in that it allows you to find the primary places where each author is mentioned throughout the book. In the short time that I have had it, I easily justified the cost of the book by rapidly finding author references.

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Alkaloids, Volume 1: Chemical and Biological Perspectives. Edited by S. WILLIAM PELLETIER. Wiley-Interscience, 605 Third Avenue, New York, NY 10158. 1983. 398 pp. 16 × 24 cm. Price $60.00.

Alkaloids never seem to cease attracting the interest of chemists. Since the turn of the century, numerous books and series have been published on the subject. This is another ambitious, comprehensive treatise intending to add new perspectives to the subject. The series takes a new topic-oriented approach, departing from the traditional descriptive system based on the class of compounds.

The first volume begins with the nature and definition of an alkaloid by the editor and includes such mixed topics as "Arthropod Alkaloids: Distribution, Functions, and Chemistry," by T. H. Jones and M. S. Blum; "Biosynthesis and Metabolism of the Tobacco Alkaloids," by E. Leete; "The Toxicology and Pharmacology of Diterpenoid Alkaloids," by M. H. Benn and J. M. Jacyno; and "A Chemotaxonomic Investigation of the Plant Families of Apocynaceae, Loganiaceae, and Rubiaceae by Their Indole Alkaloid Content," by M. V. Kisakurek, A. J. M. Leeuwenberg, and M. Hesse. All were written by unquestionable experts in their particular field and provide not only first-hand information by researchers themselves, but also deep insights into the individual subjects.

Dr. Pelletier's devotion to the chemistry of alkaloids, especially diterpenoid alkaloids, is widely known, and his ability to cover this broad topic is also well-proven by his earlier publication in *The Royal Society of Chemistry—Specialist Periodical Reports* on alkaloids. In the first volume he has certainly exercised his knowledge of the topics and taken advantage of his close acquaintance with top researchers in the individual fields. However, it remains to be seen in future volumes how successful the series will be in raising the interest of interdisciplinary readers in such diversified areas as medicinal chemistry, natural products chemistry, pharmacology, pharmacognosy, biochemistry, phytochemistry, plant taxonomy, oncology, forensic science, and medicine as originally intended. At any rate, in conjunction with recent research interest in natural products chemistry, books taking the multidisciplinary approach as, for example, a series on marine natural products with the same subtitle (*Marine Natural Products: Chemical and Biological Perspectives*, P. J. Scheuer, Ed., Academic Press, Volumes I–V), are seen more and more on the bookshelves.

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Annual Review of Pharmacology and Toxicology, Volume 23. Edited by ROBERT GEORGE, RONALD OKUN, and ARTHUR K. CHO. Annual Reviews Inc., 4139 El Camino Way, Palo Alto, CA 94306. 1983. 713 pp. 15 × 22 cm. Price $27.00.

This review of pharmacology and toxicology continues a successful series of monographs in these areas. The book contains 27 different reviews and a review of the reviews. Each of the reviews is written by a person familiar with the area of research. The reviews are normally concise and well referenced; important tables and figures are included in many of the reviews. The initial review by Leslie Iversen on "Nonopioid Neuropeptides in Mammalian CNS" provides some insight into the re-

markable changes that have taken place in understanding chemical substances that are important in the central nervous system over the past ten years. Cannon's review on "Structure–Activity Relationships of Dopamine Agonists" is well illustrated with chemical formulas, which is an important aid in following the discussion. The chapter on "Recent Developments in Mass Spectrometry for the Analysis of Complex Mixtures" provides some very basic and informative material on how the new techniques in this area are being used. The volume provides a number of other very timely reviews; they seem to be well written and could provide the reader with some initial leads to more in-depth studies that have been carried out.

The indexing for the volume is very complete, both by author and subject, for rapid access to the desired material. Each of the reviews ends with a Conclusion or Summary section which distills each review to some very basic points and areas of interest for the future.

Because of the nature of the series, this would be a good volume to have present in the library so that individuals could easily read a review in one of the areas covered. I would recommend that the volume be acquired for a School of Pharmacy library or Health Science library or in a general reading room facility for faculty and graduate students. The volume provides a valuable resource for a reasonable cost, in that the authors of the various sections have provided good coverage of findings that have taken place in recent years in pharmacology and toxicology.

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FREE RADICALS AND CANCER. Edited by ROBERT A. FLOYD. Marcel Dekker, Inc., 270 Madison Avenue, New York, NY 10016. 1982. 541 pp. 16 × 23.5 mm. Price $69.75 (20% higher outside the U.S. and Canada).

The role of free radicals in cancer development has been of concern to, and studied by, many investigators in the past three decades. Up to the present, however, there is as yet no clear-cut settlement of this seemingly simple but actually complicated problem and probably there never will be. This is perhaps one of the main reasons that the editor is compiling the thoughts of many investigators from all over the world into one volume.

Thirteen groups of researchers contributed their findings and interpretations. These include (titles abbreviated): C. Nagata *et al.* (Free Radicals from Chemical Carcinogens and Significance in Carcinogenesis) from Japan; [illegible] *et al.* (Nitroxide Metabolism in Liver Microsomes) from the Federal Republic of Germany; H. M. Swartz (ESR Studies of Cancer) of Illinois; E. Cavalieri *et al.* (Multiple Activation Mechanisms in Aromatic Hydrocarbon Carcinogenesis) of Nebraska; A. M. Bobst (Spin Bioassays with Nucleic Acids) of Ohio; J. Cadet and R. Téoule (Binding of Radiosensitizing Drugs to DNA) from France; F. R. DeRubertis and P. A. Craven (Activation of Guanylate Cyclase and Evidence for a Free Radical Mechanism) of Pennsylvania; N. M. Emanuel (Free Radicals and Growth of Tumors) from the U.S.S.R.; R. Sridhar (Radiation Sensitizers in Therapy) of Oklahoma; R. A. Floyd (Free Radicals and Arylamine Carcinogenesis) of Oklahoma; E. G. Janzen and E. R. Davis (Detection of Free Radicals by Spin-Trapping) from Canada; J. A. Hinson *et al.* (Role of Free Radicals in the Mutagenicity of *N*-Hydroxy-2-acetylaminofluorene) of Maryland; and J. E. Biaglow *et al.* (Metabolic Activation of Carcinogenic Nitro Compounds to Oxygen-Reactive Intermediates) from the U.S. and Canada. It is probably unavoidable that writings which came from such a variety of sources would contain material with duplicate or even contradictory information. Actually this is perhaps a clever way to inform the readers of the vastness and the uncertainties of this field of study.

Aside from the key question raised at the beginning of this review, there are other points that deserve to be mentioned. Although free radicals have been detected in many carcinogens with or without enzymatic action, they have also been detected in normal and pathological tissues. Throughout this book it is reported that even some compounds possessing recognized antineoplastic action, such as doxorubicin hydrochloride (Adriamycin), or prophylactic property against cancer information, such as ascorbic acid, produce free radicals in ESR measurements. To make the situation even more complicated, some carcinogens do not produce free radicals. Free radicals generally are defined as species having ESR signals in the g = 2.00 region with line shapes and power-saturation characteristics typical of organic free radicals (the latter exclude paramagnetic metals). However, measurement of free radicals depends on a number of variable experimental conditions, including the preparation of samples, the temperature during measurement, the solvent used, the type of tissue examined, and animal species differences. Therefore, one should be extremely careful and cautious in making empirical and qualitative correlations and straightforward interpretations.

The relationship of free radicals to cancer can perhaps be approached in another aspect. That is, to study the quantitative rather than the qualitative characteristics of free radicals in certain types of cancer detection, diagnosis, and response to treatment. There are already indications in this book that an in-depth study of ESR signals may reveal characteristic information in the development and progression of certain types of tumors and tumor response to therapeutic treatment. Studies along this line should be extremely useful in cancer research.

After reading all of the material presented in this book, one may assume that free radical formation may well be just a phenomenon observed during the cellular proliferation (rather than limited to only during the cancer growth) or a phenomenon observed as formation of intermediates during metabolic activation of many chemical compounds (not necessarily limited to mutagens, carcinogens, or antineoplastic agents). The situation is analogous to that of the numerous studies on drug–DNA intercalation: that the observed phenomenon may not be the real, or the major, or even the minor, mode of biological action.

This book is recommended to those scientists who are interested in these aspects of biology and medicine, as well as to oncologists and physicians who are forever searching for the fundamental knowledge of the secret of life.

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Current Trends in Organic Synthesis. Proceedings of the Fourth International Conference on Organic Synthesis. Edited by HITOSI NOZAKI. Pergamon Press, Maxwell House, Fairview Park, Elmsford, NY 10523. 1983. 429 pp. 18.5 × 27.5 cm. Price $90.00 (£45.00).

The 30 lectures compiled from the talks presented at the 1982 IUPAC meeting in Tokyo (August 1982) constitute an impressive review of the current state of the art in the field of organic synthesis. Because the book is a reproduction of the authors' manuscripts, there are a few typographical errors and unclear figures, but these minor shortcomings in no way detract from the overall appeal of this volume. As outlined in the Preface, the book is divided into four areas: synthesis of natural products, methods for achieving stereoselectivity, new synthetic methodology, and new reactions.

The group of lectures on natural product synthesis begins with a presentation by E. J. Corey on his work in the leukotriene field, which includes synthetic methodology developed for use in this area, but with applications throughout organic synthesis, as well as total syntheses of LTB and several rationally designed inhibitors of lipoxygenase enzymes. The next lecture, by W. Bartmann, discusses the synthesis of stable analogues of PGI2, illustrating the intimate connection between chemical synthesis, biological testing, and development of commercially feasible syntheses characteristic of industry. C. Heathcock then describes the efforts of his group in the area of stereoselective aldol condensation reactions and their application to his ongoing total synthesis of erythromycin. B. M. Trost outlines the observations that lead to the development of the total synthesis of verrucarol as well as continuing work on its elaboration to verrucarin A. A review of the numerous examples of the Diels–Alder reaction developed by the group of M. E. Jung and their application to steroid and anthracycline natural products is offered next. Highly selective protecting group chemistry is the focus of a lecture by C. B. Reese on the total synthesis of yeast alanine tRNA, a nonadecaribonucleotide. W. Nagata presents the work that led to the first industrially feasible synthesis of a 1-oxacephem, illustrating the multiplicity of routes attempted and new methodology that had to be developed along