pharmacokinetics and mechanisms of actions of drugs. . . ."

The type is clear and readable. The books have glossy paper covered boards, are easy to open, and lie flat, as are typical of Marcel Dekker volumes.

Despite the nuisances and repetitiveness noted, the set is highly recommended.

Reviewed by Murray M. Tuckerman
School of Pharmacy
Temple University
Philadelphia, PA 19140

The Chemistry of Antitumor Antibiotics, Vol. 1. By WILLIAM A. REMERS. Wiley–Interscience, One Wiley Drive, Somerset, NJ 08873. 1979. 289 pp. 15 × 22.5 cm.

A lack of fundamental knowledge concerning many aspects of the biological sciences still restricts most oncologists to dealing with the treatment rather than the causes of cancer. Nevertheless, encouraging results have been attained with many drugs in the treatment of certain neoplastic diseases such as acute lymphocytic leukemia, Burkitt's lymphoma, choriocarcinoma, Hodgkin's disease, squamous cell cancer, and Wilm's tumor, Many of these remissions were achieved by the use of antitumor antibiotics.

Antibiotics are unique in their extreme diversity of chemical structures and in the fact that the "rational approach" followed so enthusiastically in the design of other classes of antineoplastic agents has played only a minor role in the discovery of their striking effects. As a result, information gained by assessing the antitumor activity of these antibiotics may be more objective than studies of more conventional drug classes. There can be little doubt that the information will contribute significantly to the future design of better antineoplastic agents and will provide a guide to the proper selection of agents for use in combination chemotherapy.

Since the discovery in 1952 that actinomycin D (dactinomycin) shows activity against experimental tumors, antibiotics have gained firm ground as a unique class of agents for the management of cancer. As a result, numerous studies on this subject mushroomed, and publications were scattered in every possible chemical, biological, pharmacological, and medical journal. Although some reviews and chapters were published occasionally on certain antitumor antibiotics, this book is the first of its type in which pertinent information in this area has been assembled in a comprehensive yet precise and clear manner. Dr. Remers' effort should be appreciated by investigators working in this field. His achievement is particularly admired by those who have tried to compile similar information, even on a smaller scale.

Volume 1 of this book is divided into five chapters: the actinomycins, the anthracyclines, the aureolic acid group, the bleomycins and phleomycins, and the mitomycins and porfiromycins. At least one member of each of these categories has recognition in cancer chemotherapy [*e.g.*, actinomycin D, adriamycin (doxorubicin), mithramycin, bleomycin B_2, and mitomycin C, respectively]. Each chapter has a concise, general introduction and is divided further into specific discussions including the discovery, isolation, and characterization, structural elucidation, possible mode of action, chemical synthesis and biosynthesis, and structure–activity relationships. Three of these five chapters also include the chemical transformations among related antibiotics.

Since many antibiotics discussed in this book tend to form chelates or complexes with certain metal ions, the author has emphasized repeatedly a significant point which, if not noticed, would cause confusion and misinterpretation by other investigators. This point is that physical properties such as optical rotation often are influenced by traces of metals and other impurities that are difficult to separate or remove from the pure compound. This case is especially true with antibiotics of the aureolic acid group in which samples with the same chemical structure were assigned as different antibiotics based on the observed discrepancy in specific rotation values.

This reviewer agrees with the author's comment that in a field where anticancer activity is the primary goal of synthesis and structural modification, it is surprising that not enough data have been published on the inhibition of experimental tumors. Judging from the many elegant total or partial syntheses recorded in this book, I cannot help but wonder whether the lengthy ones under the name of an alternate synthesis or a novel approach are of value to other investigators. Indeed, the aim of a chemical synthesis is to identify the structural assignment, to devise a practical method for more plentiful procurement of a specific antibiotic, or to facilitate analog synthesis. With the current limited funding in research, perhaps now is the best time for every dedicated investigator to reassess the true value and implication of his or her own work.

The order of tetracyclic rings in the anthracycline antibiotics (Chapter 2) given in this book was from the aromatic ring (ring A) toward the alicyclic ring (ring D) in which the glycoside is attached. However, on p. 88 and p. 102, ring A was designated as the alicyclic ring. In the literature, the conflicting order of rings A → D or D ← A has been assigned and has aroused unnecessary confusion. Since the original Italian investigators [Arcamone *et al.*, *Gazz. Chim. Ital.*, **100**, 949 (1970)] designated the alicyclic ring on the aglycone portion as ring A, perhaps such assignment should be honored rather than the general order of assignment in this book. The author also may wish to change the cell line of He La to HeLa in forthcoming books.

This reviewer also would like to add one piece of interesting information concerning the phleomycin antibiotics. Although it is known that the low therapeutic indexes of phleomycins hamper their use as antibacterial or antitumor agents, the addition of certain thioethers of purine or related heterocyclic compounds as potentiators ("amplifiers") permits the use of phleomycins at much lower levels, thereby raising their therapeutic indexes to potentially useful levels [Grigg *et al.*, *J. Bacteriol.*, **107**, 599 (1971); and Brown *et al.*, *Austr. J. Chem.*, **31**, 397 (1978) and the references cited therein].

All in all, this is a well-written and valuable book. Readers can follow easily the historical development of important antibiotics and recognize the work that has been accomplished as well as areas that still need to be studied. This book should be of interest to chemists, biochemists, toxicologists, pharmacologists, and clinicians who are interested in research.

Reviewed by C. C. Cheng
Mid-America Cancer Center
University of Kansas Medical Center
Kansas City, KS 66103

The Alkaloids: The Fundamental Chemistry—A Biogenetic Approach. (Studies in Organic Chemistry Series, Vol. 7). By D. R. DALTON. 270 Madison Ave., New York, NY 10016. 1979. x + 789 pp. 18 × 26 cm. Price $49.50 (A special price of $29.50 is available in the United States and Canada on orders of five or more copies).

The alkaloids represent the largest and most diverse group of plant-derived natural products, with well over 10,000 known members of the class involving 300 different ring systems. In view of their importance, including their significance in pharmacy and medicine, it is surprising that few textbooks on alkaloids have appeared in recent years. Thus, apart from reviews in "The Alkaloids" series, the Chemical Society Specialist Periodical Reports of the same name, and specialized reviews such as the one by Shamma and Moniot on isoquinoline alkaloids, no comprehensive general treatment of the alkaloids has appeared since that edited by Pelletier almost a decade ago. The publication of the book that is the subject of this review is thus a timely event and one that will be welcomed by all researchers involved in the alkaloid field.

The book is an outgrowth of a course taught by the author at Temple University, and this is the origin of its greatest strength and its greatest weakness. The strength of the book is that it provides for the first time, in one place, a unified account of the biosynthesis and chemistry of the alkaloids. It is organized along biosynthetic lines rather than along the traditional lines of previous works. Thus, instead of chapters on subjects such as the ipecac (ipecacuanha) alkaloids or the cinchona alkaloids, there are chapters on alkaloids derived from ornithine, lysine, nicotinic acid, tyrosine, and tryptophan and on alkaloids derived by introduction of nitrogen into a terpenoid skeleton. Although the traditional classification, largely by plant of origin, does group alkaloids of similar type, our present understanding of alkaloid biosynthesis makes the approach adopted in this book logical and desirable. Furthermore, the discussion of the biosynthesis and the chemistry of each alkaloid is integrated within each chapter rather than having the biosynthesis discussed in a separate chapter. This feature allows the reader to appreciate the synthetic approaches to the alkaloids more readily, particularly those that are modeled on an actual or presumed biosynthetic pathway.

The major weakness of the book as a standard reference on the alka-