Book Reviews

The Alkaloids: Chemistry and Pharmacology, Vol. 48. Edited by G. A. Cordell (University of Illinois at Chicago). Academic Press, Inc., San Diego, CA. 1996. ix + 374 pp. 15 × 23 cm. $99.95. ISBN 0-12-469548-5.

This volume consists of four chapters, of which the first is a survey of the medicinal plants of New Caledonia, by Sévenet and Pusset. The presentation is arranged taxonomically, beginning with the Gymnosperms (Taxaceae) and proceeding to the Angiosperms (Magnoliidae, Dilleniidae, Rosiidae, and Asteridae), of which the last, containing the Apocynaceous family, is by far the most prolific in alkaloid content. There is a good deal of interesting information concerning the uses of many of these plants in traditional, ethnic medicine, which presumably prompted the examination of these plants in the first place. However, the survey is purely factual, and is presented from a botanist's point of view; there is, therefore, no reference to the chemistry and laboratory synthesis of the alkaloids. Although not all the alkaloids isolated are listed, over 450 are mentioned by name, and over 250 structures are illustrated.

The second chapter, by Bosch, Bonjoch, and Amat, is an invaluable review of the *Strychnos* alkaloids, which begins with a list of skeletal types followed by an alphabetical list of *all* known alkaloids, and a further list, which includes the structures and references to physical data and occurrences; some 224 alkaloids are listed. There follows an authoritative review of all the synthetic approaches to the *Strychnos* alkaloids published during the last 7 years. The discussion is arranged according to the ring that is formed last in the synthetic sequence; this has the advantage that, in general, it allows a unified presentation of the various strategies adopted by the major workers in this area.

The third chapter, by Borschberg, consists of an exhaustive account, covering the period 1983−1995, of the isolation, structure determination, and total synthesis of the *Aristotelia* alkaloids, in order of increasing complexity. Speculative proposals for the biogenesis of the alkaloids are presented in four schemes, which contain several interconversions that have already been mimicked *in vitro*, and the chapter concludes with what is known of the pharmacology of these alkaloids.

In the final chapter on *Erythrina* and related alkaloids, Tsuda and Sano present a brief summary of the occurrence of these alkaloids, with a tabular survey of the structures, names, and sources of all 94 erythrina and 67 homoerythrina alkaloids. The biosynthesis is also briefly discussed, followed by a relatively comprehensive section on structure determination. The construction of the erythrinan and homoerythrinan ring systems is then discussed in general terms, and the chapter ends with a survey of syntheses of the natural alkaloids. The period covered in this chapter is from 1979 to 1994.

This volume covers a vast amount of recent synthetic work, which is neatly summarized in over 120 reaction schemes, and in summary, it constitutes a notable addition to the Manske−Cordell series of monographs. Although none of the authors is a native English speaker, the standard of writing is impeccable throughout. This volume has a good subject index, but the practice of including an author index in this series appears regrettably to have been abandoned. Misprints are rare (I have only spotted five so far), and the presentation of the book is superb; it is a pleasure to handle.

This volume will be indispensable to anyone working in any of the areas covered, but in view of the wide-ranging and brilliant synthetic work discussed in three of the chapters, it will have a much wider appeal, since it illustrates in an impressive manner the state of the art of heterocyclic synthesis.

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Modeling Molecular Structures. Edited by Alan Hinchcliffe (University of Manchester Institute of Science and Technology). John Wiley & Sons, New York, NY. 1996. xv + 256 pp. 18.5 × 24 cm. $29.95. ISBN 0-471-95923-5.

This book, a part of the Wiley Tutorial Series in Theoretical Chemistry, gives a good survey of computational methods that have been utilized to describe molecular structure. The topics covered range from Molecular Mechanics through the Huckel Theory and Differential Overlap Models to the Ab-Initio package−Gaussian 92−and Electron Correlation. It also surveys a sampling of physical properties that have been calculated using the methods discussed.

The level of the book is for chemists who already have a grounding in computational methods and are interested in some of the computational details as well as how computational chemistry can be used to supplement experiments. There are a number of very good chapters. A chapter on Primary Properties that discusses Electric Multipole Moments and the Electric Potential is of interest as is the chapter on Induced Properties, which includes discussion of Induced Dipoles, Interaction Polarizabilities, and Magnetizabilities. Particularly noteworthy is the chapter on Potential Energy Surfaces. In this chapter the author uses simple examples to give an excellent feel for the methods currently used to find minima on potential energy surfaces. He also extends the methods to a discussion of using the Berny optimization technique to find minima on multidimensional surfaces and mentions, almost in passing, that this method can be extended to find transition states on multidimensional surface. The transition-state discussion is so brief, however, that it would leave the reader

wondering about details of the method. He also fails to give the reader an appreciation of the difficulty of applying the transition-state seeker to chemical mechanisms in general. The book ends with a discussion of half a dozen applications that will give the reader some flavor of recent applications of calculational methods to problems of chemical interest.

Although the book is well written, it is not clear what its primary intended audience would be. Unfortunately, the level of treatment is such that there is considerably more mathematical detail than the experimentalist interested in using the book as a compilation of what can be gained from using calculations would likely be interested in, but it is not sufficiently detailed to meet the needs of the person interested in mathematical aspects of the computations. It is probably best suited for use in an advanced undergraduate or beginning graduate course designed to introduce students to molecular modeling.

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Computer-Aided Molecular Design: Applications in Agrochemicals, Materials and Pharmaceuticals. Edited by C. H. Reynolds (Rohm and Haas Company), M. K. Holloway (Merck Research Laboratories), H. K. Cox (Zeneca Ag Products). American Chemical Society, Washington, DC. 1995. x + 428 pp. 15 × 22.5 cm. $109.95. ISBN 0-8412-3160-5.

Computer-Aided Molecular Design (CAMD) consists of many different methods aimed at solving a variety of chemical problems. As a collection, these methods form a set of powerful tools that are being used in a number of industrial and academic laboratories to design and develop new chemical products. This book brings together a number of examples in which CAMD has increasd the mechanistic understanding and/or provided energetic and structural information that has assisted in the design of new drugs, agrochemicals, and materials. The book is well organized and referenced (ca. 850), and each chapter is lucid. The balance between the theoretical bases behind the methods, the application of the methods, and results is well maintained.

Chapter one provides a short historic overview of computational chemistry and provides the reader with a brief description of the various CAMD techniques. The description covers the scientific underpinning of each method, what type of information can be obtained, and computational cost relative to other methods. In addition, modeling paradigms that have been found to be of general use such as structure-based design, novel lead generation, protein homology modeling, and catalysis simulation are discussed. The remainder of the book is divided into three sections. The sections contain case studies aimed at the understanding of the underlying mechanisms and/or design of new products in pharmaceutical, agrochemical, and material sciences. Molecular dynamics studies are presented on backbone-modified antisense oligodeoxynucleotides, drug diffusion in biomembranes, polyelectrolyte adsorption on mineral surfaces, and the behavior of organic molecules in zeolites. Studies using Genetic Algorithms (GA) to design a screen for antihinovirus agents and new materials are reported. In addition, case studies using Quantitative Structure Activity Relationships (QSAR), structure-based design, de novo design, and quantum mechanics are reported.

Overall, this book will be most useful to chemists who wish to apply CAMD to their own research. It provides a collection of examples that clearly demonstrate how CAMD can be used to assist in moving a project forward without setting up unrealistic expectations.

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Chemistry and Toxicology of Diverse Classes of Alkaloids. Edited by Murray S. Blum (University of Georgia). Alaken Incorporated, Fort Collins, CO. 1996. v + 386 pp. 15 × 22.5 cm. $99.50. ISBN 1-880293-06-4.

Five chapters on the chemical and toxicological properties of alkaloids from terrestrial and marine sources and one chapter describing alkaloids as anticancer agents comprise this book edited by M. S. Blum. *Chemistry and Toxicology of Diverse Classes of Alkaloids* is a companion volume to *The Toxic Action of Marine and Terrestrial Alkaloids* published recently by Alaken, Inc., which was reviewed in this journal (*J. Nat. Prod.* **1996**, *59*, 1218−1219).

In this book, G. T. Tan and J. M. Pezzuto describe *Toxic Alkaloids Pertinent to Cancer Chemotherapy* (711 references); Atta-ur-Rahman and M. I. Choudhary discuss *Toxic Alkaloids and Other Nitrogenous Compounds from Marine Plants* (87 references); M. S. Blum elaborates the *Chemistry and Toxicology of Arthropod Alkaloids* (112 references); W. Z. Antkowiak details *The Chemistry and Toxicology of Mushroom Alkaloids* (387 references); J. M. Jacyno delineates *The Chemistry and Toxicology of the Diterpene Alkaloids* (100 references); and T. Higa and J.-I. Tanaka survey *Bioactive Marine Alkaloids from Okinawan Waters* (125 references).

The chapter by Tan and Pezzuto focuses on specific alkaloids from the 15 families of antitumor alkaloids that have demonstrated clinical antitumor activity. Their survey provides insight into botanical source and occurrence, chemistry and structure−activity relationships, proposed biochemical mechanisms of cytotoxic/antitumor activity, clinical pharmacology and pharmacokinetics, clinical applications and toxicology, and mechanism of resistance to antitumor alkaloids. Pertinent alkaloids discussed include *Vinca* alkaloids, acronycine, camptothecin, *Cephalotaxus* alkaloids, ellipticine, indicine *N*-oxide, and swainsonine. This richly detailed presentation is accompanied by over 700 citations.

Atta-ur-Rahman and Choudhary describe toxic nitrogenous natural products derived from marine plants and microorganisms that are not restricted to alkaloids in a chapter that is complementary to the review of toxic alkaloids from marine invertebrates in the companion volume (see above). Their review provides toxicological information on guanidine alkaloids, indole alkaloids, pyrrole alkaloids, and numerous miscellaneous alkaloids including cyanocycline A, PB-1, majusculamide C, malyngamide F, prorocentrolide, heptatotoxin, fellutamide A, homothamnin A, and cylindrospemopsin.

Evolutionary developments have propelled arthropods into a position of ascendancy with 80% of all animals being members of the phylum. Terrestrial arthropods are dominated by insects but also include invertebrates such as harvestmen, centipedes, millipedes, and spiders. The defensive secretions of arthropods generally are fortified with alkaloids. Blum describes compound classes such as pyrrolidines, pyrrolines, and pyrroles; piperidines, piperideines, and pyridines; indolizidines; pyrrolizidines; coccinellines; exochomines; adaline; quinazolinones; pyrazines; tetraponerines; indoles; quinolines; and pederin. Fourteen different classes of alkaloids have been identified as arthropod natural products, many of them possessing very unique structures.

Antkowiak provides a comprehensive survey of alkaloidal mushroom toxins that is illustrated by nearly 400 literature citations. The most toxic mushrooms, Death Cap (*Amanita phalloides*) and Destroying Angel (*Amanita virosa*), cause tragic poisonings yearly in the western United States. Mushroom toxicity may be derived from toxins other than the constituents of the organism itself; e.g., following the Chernobyl nuclear accident in 1986, increased levels of ^{137}Cs and ^{134}Cs contents were observed in mushrooms from the vicinity. Under the heading of hepato- and nephrotoxins are discussed phalloides syndrome (acute liver failure), orellanus syndrome (acute renal failure), and *Gyromitra* syndrome. Intoxications caused by mushroom neurotoxins include muscarine syndrome and pantherine syndrome. Intoxications evoking inebriations or hallucinations are psilocybin syndrome, bufotenine and its congeners, psychoactive effects of *Gymnopilus spectabilis*, and acromelalga syndrome. Intoxications affecting the hematologic system are *Coprinus* syndrome and mushroom toxins causing hemolysis such as phallolysin and constituents of *Paxillus involutus*. Intoxications evoking gastrointestinal syndrome are also documented.

Jacyno's chapter on diterpenoid alkaloids, of which more than 400 are known, points out that a major reason for current interest in their pharmacology and toxicology is derived from their potential use as novel pharmacological agents and molecular pharmacological probes. This chapter provides an update of a 1983 review by Benn and the author. A summary of pharmacological data is provided for 40 compounds from *Delphinium* and *Aconitum*. Human poisoning, cardiovascular toxicity, and ocular toxicity are discussed.

Higa and Tanaka's chapter details the toxicological properties of cytotoxic nitrogen-containing compounds from marine organisms inhabiting the 50 islands comprising Okinawa. Forty-eight algal species have been screened; the bioactive compounds isolated from these organisms include indoles, manzamines (carbolines), oxazoles and thiazoles, polyketide amides, and pyridine alkaloids.

The claim by the Editor that "this volume illuminates a wide diversity of alkaloids as remarkable natural products from both a structural and pharmacological standpoint" is borne out in each of the six chapters. The book is highlighted by the extensive and comprehensive chapters on *Toxic Alkaloids Pertinent to Cancer Chemotherapy* and *The Chemistry and Toxicology of Mushroom Alkaloids*, each of which serves as a major reference source in their subject area. Furthermore, the other four chapters are solid contributions on more specialized topics. Although the lack of either a subject or an organism index is a serious deficiency, *The Chemistry and Toxicology of Diverse Classes of Alkaloids* and its companion volume *The Toxic Action of Marine and Terrestrial Alkaloids* both may be recommended for purchase by chemists, toxicologists, pharmacologists, and neurophysiologists and by organizations whose clients are interested in the chemical and pharmacological properties of alkaloids.

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African Ethnobotany: Poisons and Drugs: Chemistry, Pharmacology, Toxicology. By H. D. Neuwinger (St. Leon-Rot, Germany). Chapman & Hall, Weinheim, Germany. 1996. xviii + 941 pp. 19 × 27 cm. $248.00. ISBN 0-532-42154-5.

The use of plants in the preparation of arrow poisons remains one of the least understood aspects of indigenous plant use in Africa. The author correctly remarked in the opening paragraph of this important book that: "seldom has there been as much fantasy, speculation and even nonsense written about a single subject as African arrow poisons." The author laments the fact that only very little factual information exists on the subject. This book is therefore an important and welcome contribution to the ethnobotany of African plants used in the preparation of arrow poisons.

It is an immensely valuable book, which adds much to understanding the chemistry, pharmacology, and toxicology of more than 240 poisonous plants. It gives a detailed account of the use of subject plants in various parts of the continent. The plants are arranged alphabetically according to families, and within each family the genera and the species are also arranged alphabetically. The names of the species have been carefully checked to avoid listing synonyms as separate species. The vernacular names are included for each species, with the languages grouped according to the countries where they are used. Chemical structures are provided for the major constituents listed. The bibliography is quite extensive and would be valuable to graduate students and scientists looking for a good overview of the subject. The book has a few obvious flaws; for example, many plants included in the collection are not in fact hunting poisons but fillers, carriers, and masking

agents. Although most of the plants used as hunting poisons are also used in African ethnomedicine, however, most traditional African remedies are in fact food plants and not poisonous. The map of Africa included with each entry does not depict distribution of the plant species but to the countries where the plants are used for hunting. This could be misleading since it is conventional to associate such maps with distribution.

This book is well researched and will be an excellent reference book for pharmacists, chemists, toxicologists, ethnopharmacologists, and anybody interested in the constituents and activity of medicinal plants. For those working specifically on the ethnobotany, phytochemistry, or pharmacology of African medicinal plants, this is undoubtedly one of the most important volumes to have on their shelf.

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Comparative Ethnobotanical Studies of the Amerindian Groups in Coastal Ecuador. Edited by Anders S. Barfod (Aarhus University, Denmark) and Lars Peter Kvist (Royal Veterinary and Agricultural Highschool, Denmark). The Royal Danish Academy of Sciences and Letters, Copenhagen, Denmark. 1996. 166 pp. 21 × 25.5 cm. DKK 300.00. ISBN 87-7304-278-1.

This book represents a very comprehensive contribution to the knowledge of the ethnobotanical use of plants by three groups of indigenous people in Coastal Ecuador. The botanical rigor of this publication is excellent. All collections are documented with voucher herbarium specimen numbers so that any specialist in the future may consult the data and verify the determinations as listed. The illustrations are well produced and give the reader a sense of the peoples with whom the authors worked. There is an index to scientific names and to vernacular names. These indexes make this book a highly useful tool for future researchers who are seeking to work with the flora and knowledge of these cultures as it relates to plants for various uses, whether they be agricultural, ornamental, medicinal, or otherwise.

The results section describes the contents of 80 tables listing plant uses. Categories include timber, construction materials, social products, food, and notably nearly 40 different tables on medicinal uses. The different medicinal use tables are divided into a variety of subcategories. There is an interesting discussion of the curing ceremonies and the cultural context of healing by shamans. In the extensive section on medicinal uses of plants, the authors have replicated what can be referred to as "old style ethnobotanical research." The medicinal plant section lacks any real medical analysis. It also reflects a fairly significant cultural bias on the part of the authors regarding the potential origin and use of medicinal plants and their potential to yield biodynamic constituents. The specific cultural bias to which the authors have succumbed is an overinterpretation of the "doctrine of signatures." The cultural bias is matched by a lack of medical scientific rigor regarding the signs and symptoms of the diseases or illnesses being treated. An ethnobotanist and physician research team would have dramatically enhanced the accuracy and utility of their medicincal plant data. In some sections there is reference to a common fungal infection that, if photographs were taken of that fungal infection and showed to a tropical physician, could easily be identified to species and help further understand what exactly is being treated by these people. This lack of medical assessment or analysis is fairly consistent throughout the entire sections on medicinal plants. There is virtually no discussion of potential efficacy of any of the treatments as observed by the scientist or reported by the healers, so no qualitative differentiation of any sort is made.

Indigenous disease medical systems and disease descriptions are often distinct from the western paradigm, but there are often underlying physiological conditions that can be recognized as cross-culturally relevant by western trained physicians working with healers and shamans. It is in part a disservice to the medical systems of these cultures to not employ a specialist to work with their specialist when looking at medicinal plants.

One other feature of this publication that requires more attention is the intellectual property rights of indigenous peoples and the Convention on Biological Diversity. The authors do make a statement that "all intellectual rights to the information presented in this paper remain with the indigenous communities in Ecuador". This is critical. Considering the intense debate and discussion on this topic, it would be appropriate to refer to the specific statements of indigenous organizations such as COICA about their views on intellectual property rights. There is no indication that there was a prior form of consent or discussion among the various groups about ultimate publication of this document including the medicinal plant information that is contained therein. Clearly this will be a critical feature of subsequent future publications that involve indigenous knowledge.

The authors are clearly highly skilled botanists and general field researchers. The shortcomings mentioned should not overshadow the significance of this well-documented publication. It does highlight the need for interdisciplinary research, particularly when it comes to looking at the highly complex issue of culture, medical systems, and medicinal plant utilization.

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Ethnobotany—Principles and Applications. By C. M. Cotton. Roehampton Institute, London. John Wiley & Sons, Inc., New York, NY. 1996. ix + 424 pp. 15 × 22.5 cm. $49.95. ISBN 0-471-95537-X.

Designed for the undergraduate student in ethnobotany, this book will prove useful to anthropologists

and botanists, and thanks to a strong emphasis on the pharmacological side of ethnobotany, to pharmacists as well, even *zoopharmacognosists*: "Homo might have learned to use plants for medicines or other purposes on the basis of observed animal behaviour".

Cotton's introductory quote suggests that the best ethnobotanist would be an ethnic minority trained in botany and anthropology. Interestingly he draws this introductory quote from another good ethnobotany book, published a year earlier by Martin. One hundred years apart, Harshberger in 1896 defined ethnobotany as "the use of plants by aboriginal peoples", while Cotton in 1996 considers ethnobotany "to encompass all studies which concern the mutual relationship between plants and *traditional peoples*."

Cotton has produced twelve chapters, (1) introduction, (2) plant structures, (3) traditional botanical knowledge, (4) ethnobotanical methodology, (5) subsistence, (6) agriculture and domestication, (7) material culture, (8) traditional phytochemistry, (9) indigenous philosophies, (10) paleoethnobotany, (11) applied ethnobotany, and (12) sustainable development. The book's greatest offering to me is a plethora of valuable tables, many with dollar data on the ethnobotanicals.

Those of us interested in evolutionary diets, i.e., diets consumed by the primitive ancestors of modern man, will also find much of interest, e.g., the history of many in Australia. The first Australians arrived from Indonesia ~40 000 years ago. When European pioneers arrived in 1788, there were 500 000 aborigines with 500 distinct language groups. The population fell to 60 000 by the 1890s, but today there are 250 000 Aborigines, mostly urban. Thus, the Australian Aborigines have had two to four times as long to coevolve with their flora as the Amerindians are estimated to have been in America. Historically, nomadic groups of the vast central desert relied fairly heavily on the seeds of wild grasses like wild millet (*Panicum decompositum*). Elsewhere, others depended on underground storage organs (*Dioscorea*, *Microseris*, *Nymphaea*). "During periods of seasonal stress, Aboriginal groups have often used food plants which, although rich in nutrients are inherently toxic, and require sophisticated processing" (*Cycas*, *Dioscorea*, *Macrozamia*). So add Australia to Africa, America (N & S), and Asia as continents on which wild yams served as important foods for the Aborigine. So humankind and her genes have had a long flirtation with diosgenin, the chemical precursor for many steroid hormones.

There are some interesting surprises among the examples of various ethnobotanical uses of plants, and that to me was the most refreshing part of the book. I recommend it, not only as a textbook, but as interesting reading for scientists of many disciplines.

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Biomedical Frontiers of Fluorine Chemistry. Edited by Iwao Ojima (State University of New York at Stony Brook), James R. McCarthy (Neurocrine Biosciences, Inc.), and John T. Welch (State University of New York at Albany). American Chemical Society, Washington, DC. 1996. xi + 356 pp. 15 × 22.5 cm. $99.95. ISBN 0-8412-3442-6.

In the organic chemistry of fluorine, there have been three distinct breakthroughs: refrigerants (1930), plastics (around (1940), and pharmaceuticals (late 1950s). Up to 1970, only a few fluorinated pharmaceuticals had practical applications: inhalation anesthetics, fluorosteroids, fluorouracil, and a few others. By 1990, some 35 fluorinated pharmaceuticals were on the market. Today, over 160 fluorinated pharmaceuticals and 100 fluorinated pesticidies are commercially available, according to Becker's *Inventory of Industrial Fluoro-Biochemicals*. A thorough study of biochemical and medicinal aspects seems to be a center of gravity of the present research in organic fluorine chemistry.

The book, very appropriately entitled *Biomedical Frontiers of Fluorine Chemistry*, summarizes accomplishments in this field, especially over the past 5 years. It has been assembled from three American Chemical Society Symposia held in 1995: "Fluoroamino Acids and Peptides in Medicinal Chemistry" (Iwao Ojima), "Fluorine in Drug Design" (J. R. McCarthy), and "Fluorine in Biological Chemistry" (J. T. Welch). In addition to the papers selected from these three symposia, some additional chapters written by other experts in this field have been included.

The first of the 23 chapters is an overview of trends in research on biomedical fluorine compounds. Strong electronic effects and the relatively small steric requirements of fluorine and trifluoromethyl groups, and the effects of replacement of carbonyl oxygen by CHF and CF_2 groups, are leads to clarifying the mechanisms of action of some fluorinated compounds and to their practical applications. An important role of fluoro compounds is the inhibition of many enzymes such as proteases, hydrolases, transformases, synthesases, renin, and others. In this way, some fluoro compounds are active against cancer, viruses such as hepatitis B virus, common cold virus, HIV virus, and others. Fluoro compounds are used as antibacterials, antimalarials, antifungal agents, antidepressants, antiinflamatory agents, anorectic agents, and possibly for treatment of Parkinson's and Alzheimer's diseases.

The following chapters elaborate on the syntheses and biological effects of individual types of compounds and contain much interesting and helpful information. Thus, an elegant method for the synthesis of enantiopure fluoroamino acids is based on aldol condensation of fluorinated aldehydes with glycine attached to the nickel complex of a chiral auxiliary. The incorporation of trifluoromethyl-substituted amino acids into peptides retards proteolytic degradations and enhances lipophilicity. Trifluorinated amino alcohols play a role in enzyme inhibition. Chiral fluorocyclopropane-containing amino acids impart rigidity necessary for the study of conformational requirements for receptor specificity. New fluoroprostacyclins were found to be active against platelet aggregation and to possess antianginal activity. Chiral 6,6,6-trifluorosugars are prepared by enzymatic resolution or by a silylation method. Fluoroamino acid

derivatives of folic acid and methotrexate act as enzyme inhibitors, and similar effects were observed in some fluoroolefin isosteres. Special chapters are devoted to fluorosteroids and fluorotaxoids as potential anticancer agents. Fluorinated nucleosides are currently used as anticancer agents and also show antiviral activity against HIV. The effects of fluorinated amino acids, amines, catecholamines, and other compounds on the central nervous system are the object of a chapter dealing with neurotransmitters. Finally, the book is concluded by a chapter showing the importance of ^{18}F labeling of compounds for positron emission tomography (PET).

The book is written in a clear and concise style, and the text is accompanied by abundant formulas and documented by some 1100 references. The subject index (only 10 pages) could have been more comprehensive, and the book should have a real author index; the list of contributors is not enough. Researchers often associate certain findings and discoveries with the names of the authors of the lectures and papers, and a list of all the authors in the references would be helpful.

Overall, the book is very valuable and is a must for researchers on biologically active fluorine compounds.

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