Book Reviews

Medicinal Plants of the World Volume 2: Chemical Constituents, Traditional and Modern Medicinal Uses. By Ivan A. Ross (U.S. Food and Drug Administration). Humana Press, Inc., Totowa, NJ. 2001. xiii + 487 pp. 17.5 × 25 cm. $99.00. ISBN 0-89603-877-7.

This book is a highly recommended, nearly heroic second contribution in the series *Medicinal Plants of the World*. The first book, previously described by this reviewer, set a new standard for integrating information on 26 well-known, widely distributed medicinal plants of the world. In this improved second volume, Mr. Ross documents another 24 plant species. There are two fewer plant species than the first volume, but there are more then twice as many references, 3225 to be precise. This is wonderful, as several of the plants described, such as *Echinacea angustifolia*, *Ephedra sinica*, *Ginko biloba*, and *Hypericum perforatum*, have a huge and rapidly growing body of literature focusing on their efficacy and safety. In the case of the very intensively studied *Ginko biloba* the book contains nearly 270 references.

The author has extended his data gathering collaboration to the world's most comprehensive database on medicinal plants, NAPRALERT, which is based at the University of Illinois, Chicago. This no doubt has added depth and breadth to the literature citations on the plants described. The New York Botanical Garden Herbaria were also consulted for the production of this volume, which adds additional botanical excellence to it. I wondered as I read about sources why one other very well know medicinal plant database, partially funded by the USDA and created by Dr. James Duke, was not consulted. The author may well utilize this other excellent database for the much-anticipated third and subsequent volumes of this series.

The importance of this book is increasing everyday. People in the United States and throughout the world are turning to plant-based medicines in growing numbers. Health care practitioners have to gain basic knowledge about plant medicines in order to help guide and manage their patient's health care. This book, in combination with several other recently published references, should and will be part of the core of literature to help train the current and next generation of health care providers about the scientific and medical background of widely used phytomedicines. It is very helpful to know how a plant is used in other countries and what type of data exist to support the efficacy and/or safety of these traditional medicines in these countries.

I was surprised and disappointed not to see any references in the chapter on *Hypericum perforatum* to the very informative American Botanical Council book published by the Blumenthal and coauthors, *The Complete German Commission E Monographs*, which describes a great deal of highly relevant data on 25% of the plants described in this book. It would also have been very useful for the author to mention the World Health Organization (WHO) monograph series on many of the same plant species described in this book. The same would be true for the European Scientific Cooperative on Phytotherapy (ESCOP) monographs, whose 50 monographs on widely utilized plant species also cover many of the plants in this volume. One last area that could improve this volume would be to utilize some of the exquisite photographs of Mr. Steven Foster or others, as the images used in this book to link the reader to the plant are of rather poor quality, which is a pity given the beauty of plants.

I did however begin this review with the phrase "nearly heroic", and I do mean that. Mr. Ross has produced another detailed testimony to the tremendous importance of plants utilized around the world. As such, this book is a sort of bible for anyone working with food or medicinal plants. It also points out again the importance of traditional knowledge, as many of these plants were selected and improved over centuries by local and indigenous people for their chemical characteristics, a process that continues today around the world. The 3220 references on the chemical constituents, pharmacology, and traditional uses for a mere 24 plants highlight the complexity of the human ecological relationship with plants. The imperative to conserve the earth's biocultural diversity is extremely well illustrated by this excellent contribution by Mr. Ross. We can only ask, when will we see Volume 3?

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Handbook of Neurotoxicology, Volumes 1 and 2. Edited by Edward J. Massaro (The National Health and Environmental Effects Research Laboratory, Research Triangle Park, NC). Humana Press, Inc., Totowa, NJ. 2002. xv + 668 pp. (Vol. 1), xvi + 594 pp. (Vol. 2). 17.5 × 25.5 cm. $175.00 each (Vol. 1, Vol. 2). ISBN 0-89603-795-9 (Vol. 1), ISBN 0-89603-796-7 (Vol. 2).

The *Handbook of Neurotoxicology* comprises a two-volume series edited by Dr. Edward Massaro, assisted by 10 section editors. The first volume of this handbook focuses on the biological effects of synthesized neurotoxins, as well as those of natural origin, while the second volume explores the biologic effects of human-made toxins on the developing organism and the use of neuroimaging and neurobehavioral assessment in neurotoxicology and also addresses the neurotoxic potential of drugs of abuse.

The two volumes are arranged similarly: the first part includes a brief "Preface", followed by "Contents", a "Companion (Volume) Table of Contents", a "List of Contributors", and finally 28 (Vol. 1) and 21 (Vol. 2) monographs, respectively. The monographs are arranged under chapter topics that cover themes including Pesticides, Metals, Natural Toxins of Microbial Origin, Natural Toxins of Animal Origin (all Vol. 1), Developmental Neurotoxicology, Drugs of Abuse, Imaging, and Neurobehavioral Assessment Methods (Vol. 2). The "Pesticides" theme in Vol. 1 is subdivided into three subchapters according to mechanism of action of different pesticides.

Monographs in both volumes are well written by acknowledged experts in their respective fields, and most

feature very comprehensive literature reference lists that are extremely useful tools for investigators wishing to become more proficient in the specialized area of interest covered by the monograph author. Illustrations are of high quality and clarity throughout and contribute greatly to the ease of understanding the text. An odd feature of Vol. 2 is the inclusion of a separate color plate section in addition to the same figures appearing in black-and-white in Chapters 5 and 11−16. I suspect that this peculiarity in layout has more to do with the problems and costs associated with color printing and less with lessening confusion for the reader. In my view inclusion of the color figures at their appropriate positions in the text would have contributed greatly to ease of reading and to the overall impression of quality of these volumes.

The monographs, with a few exceptions, are appropriate to the "Neurotoxicology" theme of the volume series. However, two excellent monographs in Vol. 2, both with marijuana/cannabinoids as their theme, explore the neurochemical bases and neuroimaging of cannabinoid effects, but fail to address the relationship of these effects to neurotoxicological involvement, if any, of cannabinoid use. Therefore, the contribution of these monographs to the neurotoxicity theme of the series is at best marginal, and sadly, the superb "non-neurotoxic" contents may be lost to a wider audience.

Many of the monographs in Vol. 1, especially those dealing with natural products of microbial and animal origin, will be of particular interest to readers of the *Journal of Natural Products*. One glaring omission that should be rectified in subsequent editions of this series is a chapter that addresses neurotoxins of plant origin. A large number of plant-derived potential neurotoxins are known, some of which (e.g., harmaline from *Banisteriopsis caapi* and *Peganum harmala*, and DMT from *Psychotria viridis*) are addressed in monographs with a broader theme. However, even more noxious neurotoxins, such as BMAA from the seeds of the Guam cycad *Cycas rumphii* and hypoglycin-A from the ackee tree (*Blighia sapida*) in Jamaica and Africa, are not covered at all and deserve to be reviewed in future issues.

The contents of Vol. 2 are aimed primarily although not exclusively at clinicians and scientists involved in in vivo neurotoxicology studies, but natural products investigators interested in neurotoxicology will find a wealth of information that may be of interest directly to their field of study, especially in the superb chapter "Emerging Drugs of Abuse: Use Patterns and Clinical Toxicity".

Both volumes include very complete and user-friendly index chapters with subject subdivisions listed and cross-referenced, thesaurus-style, to alternative words. These indexes contribute to the utility of these works as excellent research tools. One critical shortcoming in these indexes, however, is the lack of a cumulative index, through which the contents of both volumes could be accessed from the index of either Vol. 1 or Vol. 2. It is hoped that this will be a feature of subsequent editions of this very useful series, since it would enhance even further the appeal of these books. However, it has to be restated in mitigation that each volume does contain a useful contents page of the companion volume as pointed out earlier.

The *Handbook of Neurotoxicology* is an essential addition to the library of any serious researcher in any field of neurotoxicology and should be available in all university libraries where chemistry, biochemistry, or medical or life sciences are studied.

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Bioassay Techniques for Drug Development. By Atta-ur-Rahman, M. Iqbal Choudhary (HEJRIC, University of Karachi, Pakistan), William J. Thomsen (Areana Pharmaceuticals, San Diego, CA). Harwood Academic Publishers, Amsterdam, The Netherlands. 2001. xii + 223 pp. 15.5 × 23.5 cm. $79.00. ISBN 90-5823-051-1.

The authors of the book call it "A Manual of Bioassay Techniques for Natural Products Research". The book is divided into two main parts, following a general introduction; Part A (98 pp) covers "Bench-top and primary bioassay screening", while Part B (96 pp) covers "High-throughput screening". A total of 204 references are provided in alphabetic order of authors' names, but without article titles. A useful subject index with approximately 330 topics/keywords follows.

This handy book aims at providing scientists (primarily pharmacognosists, pharmacologists, physiologists, biochemists, toxicologists, biologists, molecular biologists, etc.) involved in phytochemistry and drug discovery with a step-by-step recipe book for a broad spectrum of bioassays against various pathologies. The practical bioassays are intended to detect, in a simple manner, various *in vivo* or *in vitro* biological effects of natural compounds, complex mixtures, and even synthetic analogues and/or derivatives.

Part A consists of 20 different assay headings and approximately 60 bioassays for toxicity, antimicrobial, antiviral, antimitotic, or anticancer activity, genotoxicity, control of tropical diseases, for agrochemicals, for hepatotoxicity, hypoglycemic or antidiabetic activity, diuretic activity, antihelmintic, antifertility or antiimplantation activity, *in vitro* platelet aggregation, antiinflammatory, immunomodulating, antiepileptic (anticonvulsant), analgesic, gastroprotective, or antiulcer activity, mitogenic activity (radiolabeling assay), and antiemetic activity. The authors give brief introductions to some assays (such as antimicrobial assays); it would have been helpful had they done this for each of them.

In Part B, the outlook and style of the book changes drastically when compared to the first part of the book. This part describes 23 sophisticated biochemical, enzyme, and cell-based functional bioassays. Detailed introductions to each subheading, such as enzyme biochemistry and high-throughput assays, are given to provide the reader background information on the subject matter. After the general introduction various enzyme assays, cell-based receptor functional assays, and finally radio-ligand binding assays are elaborated. This part informs the reader of the outlines and design of high-throughput screening methods and their applications in biochemical and cell- and enzyme-based assays, particularly as applied to natural products as drug candidates. Protease, tyrosinase, hyaluronidase, acetylcholinesterase, β-lactamase, and lipoxygenase inhibition assays are described in a stepwise manner.

There are a few minor criticisms; it would have been useful if the authors had provided a list of abbreviations, and the order, layout, and presentation of the contents could be improved. Unnecessary repetitions in assay procedures could be avoided by giving common information or instructions in the introductory part. Illustrations for the assays in the first part would have been helpful; the second part of the book fares better in this respect. The book lacks consistency, especially in the references part. Inclusion of a chapter or an appendix with additional information on calculations, metric units, statistics, addresses of suppliers, etc. would also have been useful.

Overall the book is reasonably priced and affordable for workers in the natural products area. It is a timely book as a manual, since simple bench-top bioassay techniques are more and more used in natural product laboratories and research institutes, and it fills a big gap as a compilation of such techniques. Despite the criticisms made above, the book is recommended as a practical guide for students and researchers. Almost 100 bioassays are presented with simple instructions. It should be a required purchase for libraries and research institutions, and its affordable price makes it possible for individual researchers to acquire their personal copy. It is particularly recommended to pharmacognosists, ethnopharmacologists, medicinal chemists, and phytochemists interested in techniques for testing biological activity.

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Plant Resources of South-East Asia 12: (2) Medicinal and Poisonous Plants 2. Edited by J. L. C. H. van Valkenburg (Prosea Publication Office, Indonesia) and N. Bunyapraphatsara (Mahidol University, Bangkok). Backhuys Publishers, Leiden, The Netherlands. 2001. 785 pp. 350 Dutch Guilders. ISBN 90-5782-099-4.

This book is the second of three planned parts of volume 12 of the multivolume handbook on useful plants of South-East Asia, PROSEA (Plant Resources of South-East Asia), a series that is targeted to educators, researchers, extension programs, and industry. This second part on medicinal and poisonous plants contains meticulously and extensively researched and compiled information on the medicinal properties of 441 species of angiosperms, belonging to 171 genera, which are presented in alphabetical order. The species selected represent a mixture of plants with a long-standing reputation in traditional medicine (such as *Alstonia, Capparis, Polygala, Quassia*) and those that have been well researched phytochemically or pharmacologically (such as *Strophanthus, Cerbera, Ipomoea, Dioscorea*) but are poorly known in the South-East Asian region. As with other PROSEA volumes, this book is the result of the efforts of many scientists based in South-East Asia (Thailand, Vietnam, Malaysia, Philippines, Indonesia, and Papua New Guinea) and The Netherlands.

Following an introductory chapter (pp 19−26) providing a step-by-step description of the process of quality control of herbal drugs, the bulk of the book (pp 29−599) comprises a compilation of 163 authored or coauthored papers or monographs, which have been well edited and elegantly put together by the volume editors. The plant taxa treated are given both genus and species entries, and the pattern of presentation is uniform throughout the book. Each genus entry includes a full author citation, the place of original publication, the family, basic chromosome number, and diploid chromosome numbers of the species treated. This is followed by an up-to-date compilation (including some references from 2001) on major species, vernacular names, origin and geographic distribution, (traditional) uses, production and international trade, properties (chemistry and pharmacology), adulteration and substitutes, taxonomic description, other botanical information, ecology, propagation and planting, diseases and pests, harvesting, handling after harvest, genetic resources, and breeding prospects. The treatment concludes with a full listing of the literature consulted, but individual citations are not provided in the text. For some species, other data are also provided, such as in vitro production of active compounds, husbandry, and yield of medicinal compounds. Following each generic write-up, a selection of species treated is presented.

For each species entry, the full species name (Latin binomial) and author citation, place of original publication, synonyms, vernacular name, geographic distribution, (traditional) uses, taxonomic description, and a selection of literature are provided. The selected literature listed is cited as numbers, each number being cross-referenced with the collective/main list of the literature cited throughout the book (full citation), which is listed as "Literature" (1131 titles, pp 600−671). As a result of this presentation format, the amount of information presented under each genus is much more extensive than that for each species, except in cases where no generic treatment is given, such as for *Cassytha filiformis* L. (pp 142−144). For many of the species treated, a set of high-quality, botanically accurate, and well-labeled line drawings is provided.

In a book of this magnitude and scope, one expects to find imperfections. However, the sporadic and minor deficiencies found in this volume are eclipsed by the thoroughness and accuracy of the researched text and the line drawings. Furthermore, the book is user-friendly, with a glossary of terms (general, botanical, chemical, and pharmacological) (pp 675−703), a list of sources of illustrations (pp 704−718), an index of compound names (pp 719−723), an index of pharmaceutical terms (pp 724−731), an index of scientific plant names (Latin binomials) (pp 732−757), and an index of vernacular names (pp 758−776). The book has a simple but elegant dark blue hard cover, with light blue and white titles, and a clearly legible text, with each lead-entry in bold-faced font. A map of South-East Asia is provided at the end of the book.

In conclusion, this monographic compilation of information on medicinal and toxic plants of South-East Asia represents a treasure house of immense value that should lead to the optimal utilization of the plant resources of this geographic region. The book is definitely of great value and is recommended to those working in the field of medicinal plants, either as researchers, educators, or professionals, as well as to anyone with a love of plants as medicines. It

will enrich any collection in both private and institutional libraries.

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Complementary Therapies for Pharmacists. By Steven B. Kayne (Faculty of Homeopathy, London). Pharmaceutical Press, London, UK. 2002. xvii + 425 pp. 15.5 × 23.5 cm. £28.95 ($41.26), paperback. ISBN 0-85369-430-3.

This reference book on complementary and alternative medicine (CAM) is written and published in the United Kingdom. The author is an experienced practitioner and educator in pharmacy and CAM. The text is divided into four major sections. Section one, titled "Introduction to CAM", consists of three chapters that introduce the readers to the general concepts, practice, and delivery of alternative medicine. It also introduces basic principles and limitations of knowledge and research in this practice area. Section two, "CAM in the Pharmacy Environment", consists of four chapters that address more fully the principles of homeopathy, anthroposophy, medical herbalism, aromatherapy, and flower remedy therapy. The third section, "Ethnic Traditional Therapies", contains chapters on integrating traditional and Western medicine, traditional Chinese medicine, and Indian Ayurvedic medicine. The final section, "Other CAM Disciplines", focuses on naturopathy, diagnostic therapies such as iridology and kinesiology, manual therapies, and mind and body therapies. At the end of the text, a user-friendly index allows readers to quickly locate topics of interest.

Each chapter in this text is fairly well-referenced and contains a bibliography, as well as listings of various organizations (names and specific contact information) that readers can communicate with to obtain further information. There also are a number of figures, tables, and black-and-white photographs dispersed throughout the book. The tables are generally useful and serve to support the accompanying text. However, several of the photographs would have been more effective with enlargement, color, and enhanced clarity. Although many of the CAM options for patients are discussed, the information provided is general and somewhat incomplete. For example, information on one of the five major domains of CAM, energy therapies (such as electromagnetic fields), is not provided. Further, the chapter on medical herbalism provides simple monographs for 17 common herbs, as well as tables that appropriately summarize the major points of interest. However, this chapter omits many commonly used herbal products of likely interest to the reader. Although some limited discussion is provided, it would be beneficial for the novice reader if they were better informed about the potentially serious complications associated with the use of some of the popular products, such as ma huang, licorice, and others.

Overall, this textbook is a relatively short, easy-to-read reference source that can be used by health care professionals and students alike. Given its rather general nature and its simple, nontechnical writing style, it also may serve as a useful resource for the general public. Overall, this book provides a general overview of various alternative medicine practices at a reasonable price. Readers who desire a more rigorous, evidence-based review of CAM topics would likely need to consult additional reference sources. Last, the book appears to be intended for readers who reside in the United Kingdom (U.K.), and, therefore, many of the remarks regarding laws, public policy, and the practice and delivery of alternative medicine may not be particularly pertinent to readers outside the U.K.

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Carbohydrate Engineering: Interdisciplinary Approaches. Edited by T. T. Teeri (Royal Institute of Technology, Stockholm, Sweden), B. Svensson (Carlsberg Laboratory, Copenhagen, Denmark), H. J. Gilbert (University of Newcastle upon Tyne), and T. Feizi (Imperial College, Harrow, UK). The Royal Society of Chemistry, Cambridge, UK. 2002. x + 196 pp. 15.5 × 23.5 cm. £79.50. ISBN 0 85404 826 X.

The book is a collection of papers that were presented at the 4th Carbohydrate Bioengineering Conference held in Stockholm, Sweden, in June of 2001. The keynote article on glycosynthases (engineered glycosidases that can be used for oligosaccharide synthesis) is followed by 22 papers that have been separated into six different sections. This format is essentially the same as used for the 3rd Carbohydrate Bioengineering Conference monograph, although individual categories are somewhat different.

The bulk of the book describes efforts in the general area of structural biology. Section 2 (Structure−Function Studies of Carbohydrate-active Enzymes) begins with a general overview of the structural enzymology of carbohydrate-active enzymes and moves on to structural studies of enzymes such as glycosidases, transglycosylases, and glycosyltransferasese. Sections 3 and 4 provide proof of concept and success stories in the area of carbohydrate enzyme bioengineering and domain design and highlights the recent advances made in understanding and manipulating the modular design of carbohydrate-active enzymes.

The sections on chemo-enzymatic carbohydrate synthesis (three contributions) and enzymology of plant cell wall carbohydrates (two contributions) provide examples of how to improve the protocols necessary to prepare, characterize, and modify oligosaccharides, polysaccharides, and carbohydrate-active enzymes. The last section (Information mining in genomes and glycomes) offers three reports in this developing area.

All of the papers are relatively brief (less than 10 pages each) and are essentially minireviews that summarize specific areas of carbohydrate engineering research. Thus, it is possible to get a reasonable handle on a specific topic through reading one or more of the reports. I can envision the book on the shelves of academic and industrial libraries where there are researchers interested in the general area of glycobiology. However, the book is off the beaten track for the audience of this journal and would need to be

referred to only by those who have specific questions pertaining to the structural biology of carbohydrate-active enzymes.

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Natural Remedies: Their Origins and Uses. By Finn Sandberg (Department of Pharmacognosy, University of Uppsala, Sweden) and Desmond Corrigan (Department of Pharmacognosy, Trinity College, Ireland). Taylor & Francis, London, U.K. 2001. viii +169 pp. 15 × 24 cm. £19.99. ISBN 0-415-27202-5.

Natural Remedies: Their Origins and Uses is a revised and updated version of the volume *Phytopharmaca Therapy*, published in Swedish by Prof. Finn Sandberg. This, short, concise paperback volume authored by two well-known pharmacognosists is intended as an introductory text in phytotherapy for pharmacists, other health-care professionals, and students with an interest in the area. The content and scope of the book are enhanced by both the medical and ethnopharmacological credentials of Prof. Sandberg and by the special interest of Dr. Corrigan in drug abuse.

The slim volume has many strengths, and one of them is the use of an Anatomical, Therapeutic, and Chemical (ATC) approach developed by the World Health Organization for synthetic drugs, which has been used for the first time for plant drugs in Chapter 6. This is by far the longest chapter of the book and is entitled "Therapeutic Pharmacognosy (Phytotherapy)", with the entries arranged in terms of their effects on the alimentary tract, the blood and blood-forming organs, the cardiovascular system, the skin, the genitourinary system, the musculo-skeletal system, the nervous system, the respiratory system, and the sensory organs, in addition to compilations of plant-derived systemic hormones, antineoplastics, and antiparasitic agents. This approach works well, although occasionally plant drugs having diverse pharmacological effects may be mentioned more than once in this chapter, as exemplified by "liquorice", which is treated both as an antiulcer drug and an expectorant containing saponins. The remaining chapters in the book (Chapters 1−5 and 7−9) are entitled in turn "Introduction", "Botanical Pharmacognosy", "The Quality Control of Herbal Medicinal Products", "Plants as Phytochemical Laboratories", "Plants in Complementary Medicine", "Chemoprevention Using Phytochemicals", "Toxicological Pharmacognosy", and "Glossary". The book provides basic definitions of crude drug names and a survey of botanical nomenclature in the first two chapters, while the chapter on quality control provides an insightful treatment of the various factors that can affect the variation in the secondary metabolite content of plant drugs. The imaginatively titled Chapter 4 briefly summarizes general biosynthetic routes of formation and the chemical classification of plant primary and secondary metabolites. In the chapter on plants in complementary medicine, useful information is provided on the available European monographs on phytomedicines and on plant drugs that have undergone clinical trial. The chapter on chemoprevention is timely, and plants such as garlic, ginseng, green tea, and soybeans are all included. The penultimate chapter deals mainly with poisonous plants from a European perspective and plant drugs of abuse. Finally, the brief Glossary is divided into one section on botanical and chemical terms and a second on medical terms. There is a comprehensive index, and the text is interspersed with attractive color photographs of medicinal plants. While many chemical structures are provided, this is one aspect of the book that might have been looked at by the authors more closely. Several of the structures are incorrect (for example, *trans*- rather than *cis*-resveratrol is shown on p 134), and stereochemistry is not always considered. Perhaps an additional round of proofreading of the text would also have been helpful, since many minor errors in chemical names and plant taxonomic authority abbreviations were also noted. However, the book is quite up to date, as exemplified both by the "street drug" terminology and by the mention of the devastating toxic effects on the kidney in persons who have consumed Chinese herbs in slimming regimens containing aristolochic acids, a fact that has only recently been fully appreciated.

Overall, I feel this book will succeed admirably in satisfying its target readership, since it fills a present void by providing an authoritative and inexpensive text that can be recommended with confidence to both undergraduates and beginning graduate students to whet their appetite in the fields of pharmacognosy and phytotherapy. According to the Preface written by Dr. Corrigan, "the modern world of medicinal plants is a fascinating kaleidoscope of botany, chemistry, medicine, toxicology, anthropology, ethnopharmacology, entrepreneurship, agriculture, information technology and old-fashioned humanity". Representatives of all of these constituencies will find much of interest in *Natural Remedies: Their Origins and Uses.*

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Dictionary of Renewable Resources. Second revised and enlarged edition. Edited by H. Zoebelein (Schilersee, Germany). Wiley-VCH, Wienheim, Germany. 2001. xx + 408 pp. 17 × 24 cm. $125.00. ISBN 3527301143.

The *Dictionary of Renewable Resources* defines renewable resources as "... products, originated from plants and animals, used for industrial purposes...and also include food products that are not used for nutrition, as well as wastes and co-products of good processing". The book is designed to function as a bridge of understanding between "... farmers, agronomists, botanists, plant breeders, seed producers, ecologists, chemists in industry and universities, economists, politicians, societies and authorities dealing with various aspects of renewable resources, and last but not least, the interested and educated layman". The book attempts to give a complete survey of the sources and technologies of isolation of renewable resources, the resulting chemicals and their properties, their chemical derivatives and the operations involved in preparing them, their biotechnological production and modification, their most important areas of application, their economic significance, and considerations for future development. This is a

daunting task, especially for a book with 327 pages of definitions. The first complete sentence in the book reads "This book was careful produced". If so, it was apparently less carefully edited. Some of the definitions are useful, such as agronomically important crops (e.g., barley, maize, rapeseed, soybean) and important classes of chemical compounds (e.g., cyclodextrins, detergents, insecticides, saponins), but the selection of entries such as "sperm whale oil" (a reusable resource?) and "superslurper" (a class of highly absorbent polymers) is capricious. It is perhaps understandable that there are only four entries under the letter "X", but I would have expected more entries under the letter "Y". In the latter case, two of the four entries are devoted to the ylang-ylang tree and its derivatives (apparently more important than, say, "yeast"). Furthermore, when I tried to examine the book from the perspective of an "interested and educated laymen", I also found it wanting. Nonetheless, it is possible that a chemist with interests in industrial processes and products would have found the book more useful. Some of the entries are extensive. For example, nearly 13 pages are devoted to "starch" and its associated derivatives, processes, and even world markets. There are lengthy definitions for items such as cellulose and its derivatives, food additives, lubricants, resins and soaps, and plastics additives. There are also definitions of industrial and chemical processes such as corn starch production, hydrogenation, metathesis, ozonolysis, and wheat starch production, but for the majority of chemists, I believe their money would be better spent on the latest edition of the Merck Index or any of a number of technical encyclopedias. Definitions of most of the chemical processes or classes of compounds featured in the book can be found in undergraduate chemistry textbooks or in books such as March's *Advanced Organic Chemistry*.

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