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