Traditional Medicines

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HERBALGRAM

The Journal of the American Botanical Council and the Herb Research Foundation

Number 31

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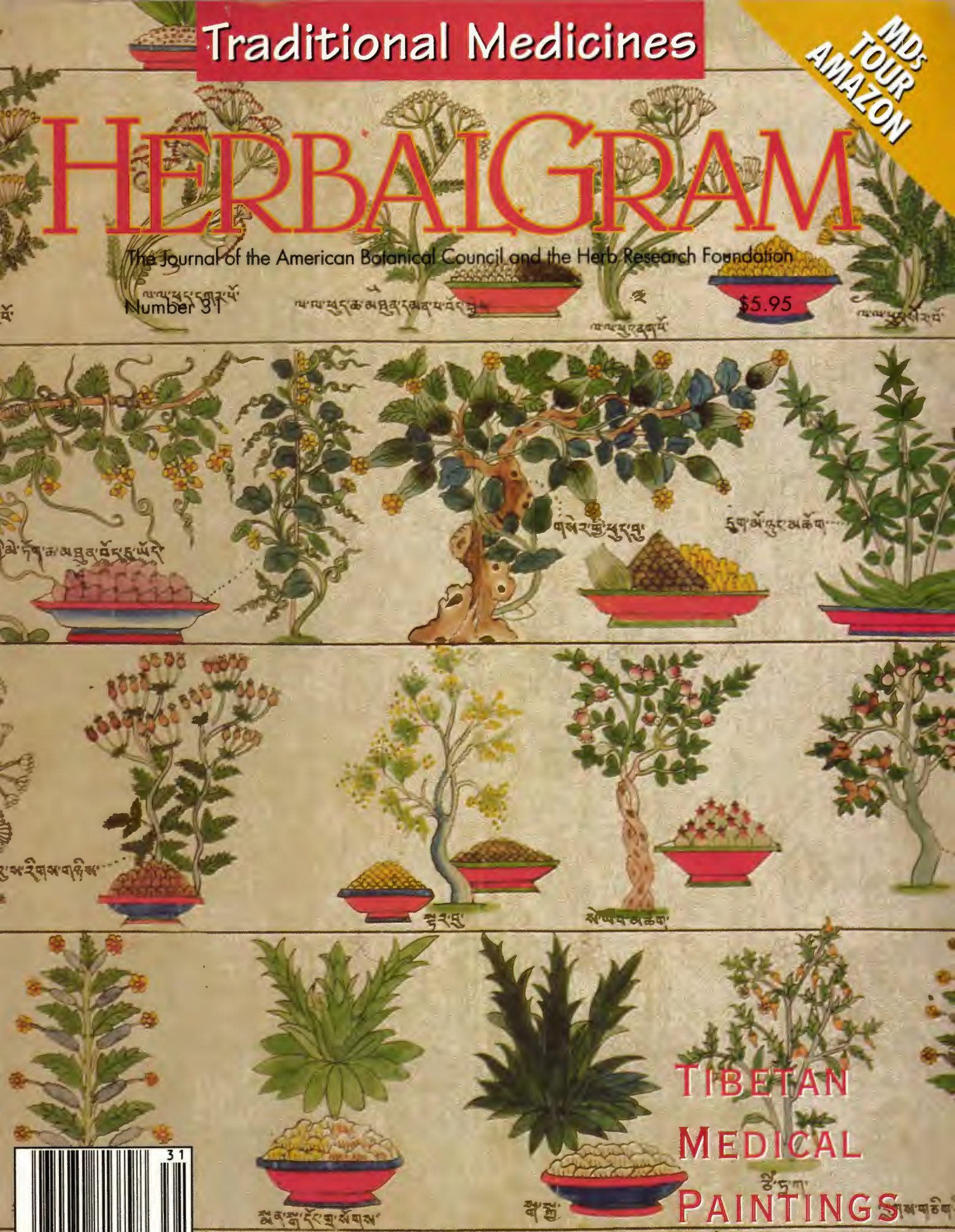

TIBETAN MEDICAL PAINTINGS

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TIBETAN MEDICAL PAINTINGS
Edited by Y. Parfionovitch, G. Dorje, F. Meyer. 1992. The Tibetan Medical Paintings illustrate the entire contents of a seventeenth century commentary on the most fundamental treatise of Tibetan medicine. Tracing these paintings across the centuries, the reader is introduced to the history of their creation, their eventual acquaintance by the West, their structure, their antecedents and uses. The set is very detailed with one book containing the color plates and their names. The second book uses numbered and labeled b/w versions of the color plates to describe all the ingredients of the paintings. Two volumes, hardcover, slipcased. $195. Please allow $15 for shipping. #B034

AMERICAN WILDFLOWER FLORILEGIUM
by Jean Andrews. 1992. Andrews' botanical art and accurate informative text combine aesthetics and science to produce a gathering of flowers (a florilegium). The plants are portrayed in a way that reveals those characteristics of importance to a taxonomist as well as appealing to those involved in the arts. Well organized, enjoyable and easy to read. Color reproductions of original art work. Hardcover, 125 pp. $50. #B033



THAILAND

EXCLUSIVELY FROM ABC

PLANTS AND PEOPLE OF THE GOLDEN TRIANGLE—ETHNOBOTANY OF THE HILL TRIBES OF NORTHERN THAILAND
by Edward F. Anderson. 1993. A study of over 1,000 plant species used by six major tribes of the remote hills of northern Thailand. Products from the forest such as fibers, dyes and medicines. Detailed appendix, illustrations, & 200 color plates. Hardcover, 279 pp. $69.95. #B043



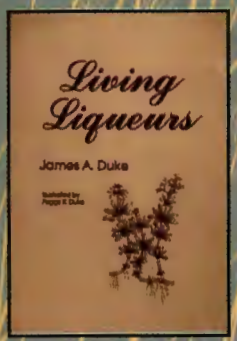
THAI MEDICINAL PLANTS RECOMMENDED FOR PRIMARY HEALTHCARE SYSTEM
Edited by N.R. Farnsworth and N. Bunyapraphatsara. 1992. Botanical information plus chemical constituents, pharmacological activities and clinical trials of medicinal plants compiled, collected, and assessed by the Medicinal Plant Information Center of Thailand. Hardcover, color photos, 402pp. $89. #B021
An ABC exclusive



ABC ANNOUNCES AGREEMENT WITH QUARTERMAN PUBLICATIONS

EXCLUSIVELY FROM ABC

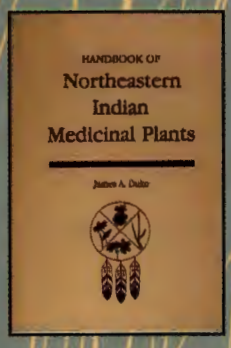
The American Botanical Council has entered into an agreement with Quarterman Publications to market and distribute four significant medicinal plant publications. This agreement furthers the goal of the American Botanical Council to continue to disseminate factual, accurate, and professional knowledge on the historical role and current potential of plants in medicine.



LIVING LIQUEURS
by James A. Duke. 1987. Useful information on the cultures, uses, and folklore of plants in various herbal drinks. Softcover, line drawing illustrations. 110 pp. $15. #B010



THE SEVEN SISTERS OF SLEEP
by Mordecai C. Cooke. 1989. Originally published in 1860. This is "one of the earliest forerunners of literature on hallucinogenic, psychoactive, and stimulant plants in advanced societies of the world." A true classic with light-hearted excerpts. Hardcover, 371 pp. $45. #B013



HANDBOOK OF NORTHEASTERN INDIAN MEDICINAL PLANTS
by James A. Duke. 1986. A compendium of Amerindian medicinal plants with information on how each northeastern Indian tribe used plants as medicine. Hardcover, 212 pp. $30. #B012



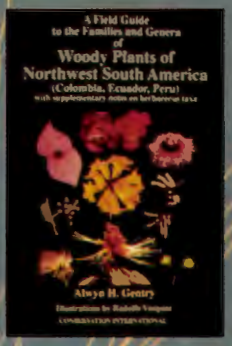
MEDICINAL USES OF PLANTS BY INDIAN TRIBES OF NEVADA
by Percy Train, James R. Henrichs, and W. Andrew Archer. 1957. A permanent record of approximately 200 native plants, considered to be of medicinal value by the Paiute, Shoshone, and Washoe tribes of Nevada. Hardcover 139 pp. $30. #B014

Amazonian Specialties

VINE OF THE SOUL–MEDICINE MEN, THEIR PLANTS AND RITUALS IN THE COLOMBIAN AMAZONIA
by Richard Evans Schultes and Robert F. Raffauf. 1992. Primarily a photographic essay, this book presents accurate scientific data distilled from a long series of scientific papers by Schultes and his many students. The aspect of Indian life which forms the focus of this book is the natives' use of hallucinogenic and other sacred plant drugs. A wonderful integration of ethnobotany, chemistry, and photography. Softcover, b/w photos, 282 pp. $22.95. #B050



A FIELD GUIDE TO THE FAMILIES AND GENERA OF WOODY PLANTS OF NORTHWEST SOUTH AMERICA
by Alwyn H. Gentry. 1993. The late Dr. Gentry incorporates his practical field experience into this guide dealing with the extraordinarily diverse floro of Columbia, Ecuador & Peru. The book presents a new approach to the identification of all woody epiphytic species in the region. Common and scientific name indexes and a listing of all figures included. Softcover, 291 b/w illus, 895 pp. $39.95. #B044.





RAINFOREST REMEDIES: ONE HUNDRED HEALING HERBS OF BELIZE
by Rosita Arvigo and Michael Balick. 1993. Drs. Arvigo and Balick open a door for us into the sacred world of traditional Mayan healers who know that the rainforest holds within its grasp all the ingredients that have sustained it and its people. An easily readable manual that chronicles ethnobotanical data collected over several years. Softcover, illustrated, 215 pp. $9.95. #B053



THE HEALING FOREST
by Richard Shultes and Robert F. Raffauf. 1990. Field research spanning half-century in the Northwest Amazon. Over 1,600 species listed with photographs and line drawings. The modern classic on Amazonian Ethnobotany. Hardcover, b/w photos, 486 pp. $59.95. #B002

THE COMPLETE MEDICINAL HERBAL



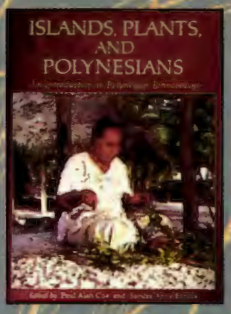
by Penelope Ody, foreword by Mark Blumenthal. 1993. One of the most beautiful herb books ever published! Over 120 color photos of all parts of the plant that can be used medicinally. Each entry details the plant's chemical constituents, actions, therapeutic applications, and safety precautions. A practical handbook and striking visual resource. Hardcover, 192 pp. $29.95. #B039.

The Pacific Connection

KAVA-THE PACIFIC DRUG
by Vincent Lebot, Mark Merlin & Lamont Lindstrom. 1992. The most comprehensive treatment of Kava ever written. Summarizes literature and research on Kava's botany, chemistry, ethnobotany, pharmacology, social usage, distribution, and economic potential. Hardcover, b/w photos, illustrations, 255 pp. $45. #B032



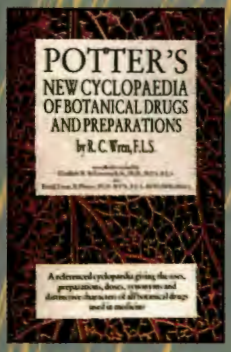
ISLANDS, PLANTS, AND POLYNESIANS–AN INTRODUCTION TO POLYNESIAN ETHNOBOTANY
Paul Alan Cox and Sandra Anne Banack (Eds.) 1991. Based on symposium sponsored by Inst. of Polynesian Studies, BYU, Hawaii. Discussions of plant environments, herbal medicine, linguistic analysis, agricultural systems & more. Hardcover, illus., b/w photos, 228 pp. $34.95 #B042



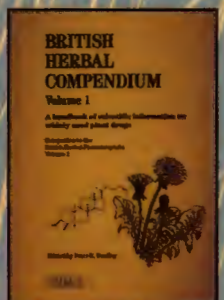
HERBAL RENAISSANCE
by Steven Foster. 1994. A significant contribution to the total knowledge concerning herbs, such as propagation, harvesting, drying, phytochemistry, folklore, and usage. 124 plant species covered. Illustrated with 45 line drawings and 8 color plates covering 20 species and/or hybrids. A classified resources list for sources of seeds or plants. Softcover, 234 pp. $16.95. #B052



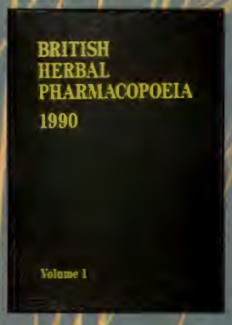
General Herbals



POTTER'S NEW CYCLOPAEDIA OF BOTANICAL DRUGS AND PREPARATIONS
1988. The newest edition of a book first published in 1907. It includes a new chemical constituents section for each plant, an updated "use" section, and regulatory status in Great Britain. Softcover, 362 pp. $34.95. #B011

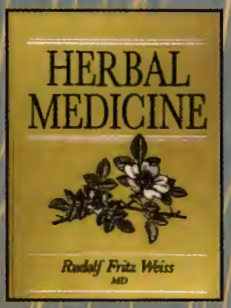


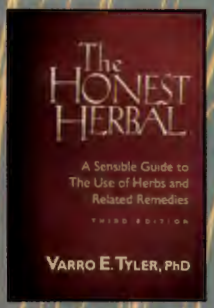
BRITISH HERBAL COMPENDIUM, VOLUME I
Edited by Peter R. Bradley. 1992. Handbook of scientific monographs on plant drug constituents and therapeutics with chemical scientific literature and excerpts from available regulatory guidelines of European countries. Hardcover, 239 pp. $85. #B017



BRITISH HERBAL PHARMACOPOEIA, VOLUME I
by the British Herbal Medicine Association. 1990. Series of monographs concentrating on "definition, description, identification and standards for plant materials, commonly used in herbal products on the market today." Hardcover, 107 pp. $55. #B018

HERBAL MEDICINE
by Rudolf Fritz Weiss, M.D. 1985. An indispensable modern text in medical herbalism. Many herbs are illustrated. Plant drugs are arranged by clinical diagnoses relating to particular systems. Softcover, 362 pp. $55. #B006





THE HONEST HERBAL
by Varro E. Tyler. 1993. Third & newly revised edition of this 1982 book by a leading authority on medicinal plants. Chapters on the general rational and irrational use of herbs and the complex laws and regulations pertaining to their sale in the U.S. Covers over 100 commonly used herbs & provides indispensable botanical information, traditional folk uses, & discussions of safety and therapeutic effectiveness. Includes a table of essential facts and is referenced extensively throughout. Softcover, 375 pp. $25.95. #B005

These books are some of the best available on their respective topics. Some are hard-to-find, others are published abroad where shipping and handling run your costs up dramatically.

General Botany



BOTANY–AN INTRODUCTION TO PLANT BIOLOGY
by James D. Mauseth. 1991. Excellent general botany textbook; lavish color photos and transparencies. Emphasis on evolution by natural selection, analysis of botanical phenomena, and diversity of organisms. Hardcover, 800 pp. + glossary and index. $61.75. #B036



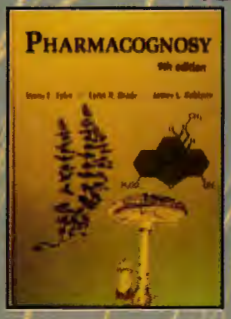
THE PLANT-BOOK,
by D. J. Mabberley. 1987. This comprehensive portable dictionary of flowering plants, conifers, and ferns will be of value to botanists, zoologists, gardeners, foresters, agriculturists, journalists, and writers who need a handy reference work on plants. Softcover, 706 pp. $44.95. #B001



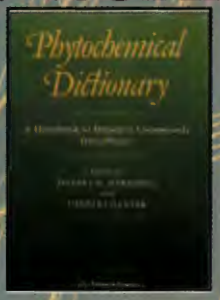
MARTINDALE: THE EXTRA PHARMACOPOEIA, 30TH EDITION
Ed. by James E. F. Reynolds. 1993. First published in 1883. 5,132 individual monographs organized by uses & actions. Contains a list of countries where monographed herbs are currently official, and is one of the best sources available on the actions, uses and toxicity of numerous international drugs. Includes a section describing 46,000 proprietary medicines from 14 countries, the active ingredients and a summary of information and much more! Indexed, full cross reference. Hardcover, 2,363 pp. $299.95. Please allow $6 for shipping. #B065

Scientific Works

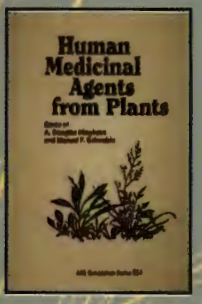
PHARMACOGNOSY
by Varro E. Tyler, Lynn R. Brady, and James E. Robbers. 1988. The standard pharmacognosy text in the U.S. Extensive background and explanation of plant and animal-derived drugs. Hardcover, 519 pp. $65. #B008



PHYTOCHEMICAL DICTIONARY
by Jeffery B. Harborne and Herbert Boxter. 1991. Basic information on 3,000 most widely encountered plant constituents. Emphasis on biological activity and/or value to humans. Handy, quick reference includes chemical structures. Hardcover, 800 pp. $350. Please allow $12 for shipping. #B009



HUMAN MEDICINAL AGENTS FROM PLANTS
by A. Douglas Kinghorn and Manuel F. Balandrin (eds.). 1993. Papers presented at "Human Medicinal Agents from Plants" symposium, San Francisco, April 1992. Most extensive and up-to-date information on a wide variety of topics in the area of medicinal herbs. Hardcover, 356 pp. $89.95. #B020





BIOACTIVE VOLATILE COMPOUNDS FROM PLANTS
by Roy Teranishi, Ron G. Buttery, and Hiroshi Sugisawa (eds.). 1993. A collection of papers presented at 203rd National Meeting of the American Chemical Society in San Francisco, April 1992. Hardcover, 309 pp. $79.95. #B019



ADVERSE EFFECTS OF HERBAL DRUGS, VOL. 1
Ed by P. A. G. M. De Smet, K. Keller, R. Hansel, R. F. Chandler. 1992. Edited by an international group of researchers intent on explaining potential adverse reactions associated with the ingestion of herbal remedies. The editors seek to report side effects of herbs in a responsible scientific manner. Includes pyrrolizidine alkaloids in five different genera plus data on arnica, chamomile, feverfew, garlic, eucalyptus, fennel, and others. Softcover, 275 pp. $79. Allow 8 weeks for delivery. #B040

ALSO AVAILABLE:
ADVERSE EFFECTS OF HERBAL DRUGS, VOL. 2
Ed by P. A. G. M. De Smet, K. Keller, R. Hansel, R. F. Chandler. 1992. The second in a series from an international group of researchers, see description of Volume 1 for details. Softcover, 275 pp. $79. Please allow 8 weeks for delivery. #B049

HERBS, SPICES & MEDICINAL PLANTS: RECENT ADVANCES IN BOTANY, HORTICULTURE, AND PHARMACOLOGY

Ed. by Lyle E. Craker and James E. Simon. 1991. A forum for a diverse audience of researchers, as well as the producers and manufacturers who depend on their discoveries. The series serves as an authoritative reference for developments in botany, horticulture, and pharmacology. Each volume is fully indexed. The references listed at the end of each article provide valuable assistance for further research. All hardcover. Vol. 1 reviews include: An Introduction to the Scientific Literature on Herbs, Spices, and Medicinal Plants; Biochemistry of Monoterpenes and Sesquiterpenes of the Essential Oils; Chemotaxonomic Aspects of Essential Oils. 368 pp. #B060. • Vol. 2 reviews include: The Alkaloids of the Papaver Section Ozytona Bernh; Vegetative Propagation of Aromatic Plants of the Mediterranean Region; Synergism and Antagonism in the Pharmacology of Alkaloid Plants. 270 pp. #B061. • Vol. 3 reviews include: Pharmacokinetics of Polyphenolic Compounds; The Biochemical Basis of the Hypoglycemic Effects of Some Plant Extracts; Plant Flavonoid Effects of Mammalian Cell Systems. 232 pp. #B062. • Vol. 4 reviews include: Excerpts of the Chinese Pharmacopoeia; Phytogeographic and Botanical Considerations of Medicinal Plants in Eastern Asia and Eastern North America. 272 pp. #B063

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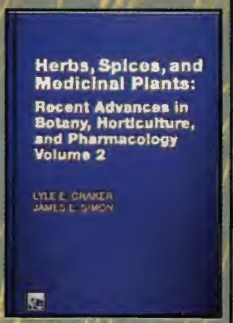




ECONOMIC AND MEDICINAL PLANT RESEARCH VOLS. 2-5

Ed. by Hildebert Wagner, Hiroshi Hikino and Norman Farnsworth. This series identifies areas of research in natural plant products that are of immediate or projected importance from a practical point of view and reviews them in a concise and critical manner. Great for those interested in the discovery of natural products and their further utilization as drugs, pharmacological tools, models for synthetic efforts, or other economic purposes. All clothbound. • Vol. 2 includes: Non-steroid, Cardioactive Plant Constituents; Natural Products for Liver Diseases; Potential Fertility-regulating Agents from Plants; Recent Developments in the Chemistry of Plant-derived Anticancer Agents. 201 pp. $80. #B055 • Vol. 3 includes: The Azadirachtins (from NEEM)–Their Potential for Insect Control; Plant Compounds as Sources and Models of Insect Control Agents. 150 pp. $80. #B056 • Vol. 4 includes: Medicinal Plants in Traditional Medicine; additional chapters on traditional medicine in China, Ghana, India, Japan, Mexico, Panama, Samoa, and Thailand. 174 pp. $83. #B057 • Vol 5 includes: Plants and Other Organisms as a Source of Anti-Human Immunodeficiency Virus (HIV) Drugs; Guggulipid: a Promising Hypolipidaemic Agent from Gum Guggul; High Capacity Screening: Natural Products as Immune Regulators; Echinacea Species as Potential Immunostimulatory Drugs. 400 pp. $120. #B058

Save time in searching and money for shipping while supporting the American Botanical Council in its efforts to inform and educate the general public about the importance of herbs.

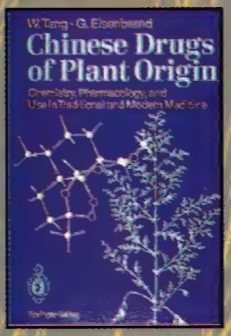
Chinese Herbals



CHINESE HERBAL MEDICINE MATERIA MEDICA (REVISED EDITION)
by Dan Bensky and Andrew Gamble. 1993. An extensive sourcebook about the most commonly used substances in Chinese herbal medicine. Each herb is illustrated and identified by its pharmaceutical, botanical, and family names. Hardcover, 380 illus., 556 pp. $75. #B003



CHINESE HERBAL MEDICINE–FORMULAS AND STRATEGIES
by Dan Bensky and Randall Barolet. 1991. Companion volume to *Chinese Herbal Medicine: Materia Medica*, the first book of Chinese medicinal formulas in English that is textbook for students and reference for practitioners. 600 Chinese medicinal formulas in 18 functional categories. Hardcover, 562 pp. 18 illustrations. $85. #B004



CHINESE DRUGS OF PLANT ORIGINS
by W. Tang and G. Eisenbrand. 1992. Information on recent advances/perspectives for future research into Chinese medicinal materials. Bridge between traditional Chinese medicine and modern Western medicine. Chemical illustrations throughout. Hardcover, 1,056 pp. $169. Allow 8 wks for delivery. #B035

MEDICINAL PLANTS OF CHINA
by James A. Duke and Edward S. Ayensu. 1985. An exceptionally useful reference. The result of a collaboration between two of the world's leading botanists, this guide to Chinese medicinal plant resources and their uses is intended for use by biologists, chemists, and laypersons. Covers 1,240 species of Chinese medicinal plants. Hardcover, b/w illus. Two volumes, 705 pp. $94.95 set. #B048



CHINESE HEALING FOODS AND HERBS
by Albert Y. Leung. 1984. Containing over 30 truly traditional, tested remedies, comprised of herbs, spices, and conventional foods. Includes traditional medicinal preparations and dosages which will enable the reader to take a new look at traditional Chinese medicine. Softcover, illus., 192 pp. $10.95. #B054



AN ILLUSTRATED DICTIONARY OF CHINESE MEDICINAL HERBS
by Wee Yeow Chin and Hsuang Keng. 1992. A Western approach hoping to remove some of the mystery surrounding Chinese medicine. A listing of over 270 Chinese medicinal herbs, including scientific and common names (with indexes), physical attributes, and historical use. Pertinent research results included. Hardcover, color plates, 184 pp. $32.95. #B041



North American Topics



TRADITIONAL PLANT FOODS OF CANADIAN INDIGENOUS PEOPLES: NUTRITION, BOTANY AND USE
by Harriet Kuhnlein and Nancy J. Turner. 1991. A description and reference to the published literature on the nutritional properties, botanical characteristics, and ethnic uses of traditional food plants of Canadian indigenous peoples. Nutrient value of 500 species of "wild" plants. Hardcover, 633 pp., b/w photos, $88. #B030



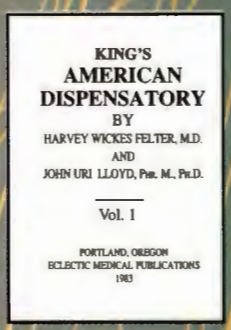
JEPSON MANUAL: HIGHER PLANTS OF CALIFORNIA
Ed. by James C. Hickman. 1993. Contributions from over 200 botanists across N. America make this a comprehensive resource and identification guide to nearly 8,000 varieties of native and naturalized plants that grow wild in California. Means of identification are accompanied by horticultural requirements, endangerment, toxicity, weed status, and notes on the management of sensitive species. Hardcover, 4,000 b/w illus., 1,400 pp. $65.00. Please allow $6 for shipping. #B051

FLORA OF NORTH AMERICA NORTH OF MEXICO VOL. 1 –INTRODUCTION
Ed. by Flora of North America Editorial Committee. 1993. Systematic general survey of plants of North America, north of Mexico, the continental US, Canada, Greenland, St. Pierre and Miquelon. Geographical range maps identified for each genus. Important resource for botanists & non-botanists. Hardcover, 372 pp. $75. #B037



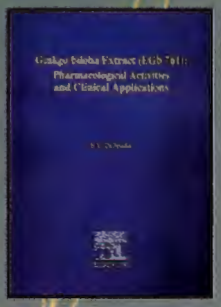
***ALSO AVAILABLE:* FLORA OF NORTH AMERICA NORTH OF MEXICO VOL. 2– PTERIDOPHYTES AND GYMNOSPERMS**
Ed. by Flora of North America Editorial Committee. 1993. Hardcover, 475 pp. $75. #B038

KING'S AMERICAN DISPENSATORY
by H.W. Felter, M.D. and J.U. Lloyd, Ph.D. Two volumes. 1898. The most complete text ever compiled on American medicinal plants and herbal pharmacy. 2,172 pages of medicinal properties and clinical administration of hundreds of medicinal plants in detail. Hardcover. $225. Please allow $6 for shipping. #B022

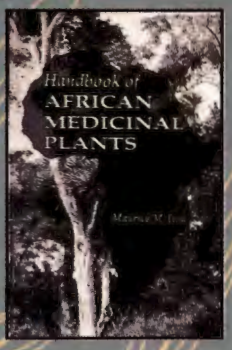


FROM CRC PRESS:

GINKGO BILOBA EXTRACT (EGb 761): PHARMACOLOGICAL ACTIVITIES AND CLINICAL APPLICATIONS
by F. V. De Feudis. 1991. A technical review of much of the experimental and clinical scientific research that has been conducted over the last 25 years. Softcover, 187 pp. $49.95 #B016



A HANDBOOK OF AFRICAN MEDICINAL PLANTS
by Maurice M. Iwu. 1990. Reference text on ethnobotany, chemical constituents, and probable therapeutic application of African medicinal plants. Hardcover, 435 pp. $99.95. #B025



A HANDBOOK OF AYURVEDIC MEDICINAL PLANTS
by L. D. Kapoor. 1990. 50 illustrations and descriptions of over 250 plants used in Ayurvedic herbal medicine. An indispensable resource for physicians, pharmacists, and those interested in the healing art. Hardcover, 416 pp. $256.95. #B023





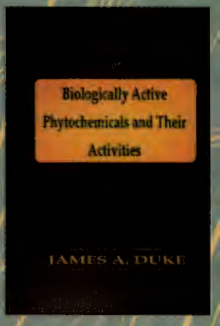
HANDBOOK OF ALTERNATIVE CASH CROPS
by James Duke & Judith L. duCellier. 1993. Describes 128 plants that can be grown as alternatives to conventional crops. Alphabetically ordered by genus ond species including information on ecology, cultivation, harvesting, economics & biotic factors. An invaluable resource for agricultural extension agents, farmers, and soil crop professionals. Hardcover, illustrated, 536 pp. $129.95. #B045



A HANDBOOK OF EDIBLE WEEDS
by James A. Duke. 1992. Detailed description, distribution data, and account of the plant's utility. A unique treatment only Duke could write. Hardcover, numerous illustrations, 246 pp. $39.95. #B024

A HANDBOOK OF PHYTOCHEMICAL CONSTITUENTS OF GRAS HERBS, AND OTHER ECONOMIC PLANTS
by James A. Duke. 1992. Chemical composition of 1,000 commonly used herbs and other plants of economic importance. Covers 3,000 compounds. Hardcover, 654 pp. $189.95. #B026

HANDBOOK OF BIOLOGICALLY ACTIVE PHYTOCHEMICALS AND THEIR ACTIVITIES
by James A. Duke. 1992. Chemical compounds listed alphabetically, with explanations of their biological activities. Hardcover, 183 pp. $99.95. #B027

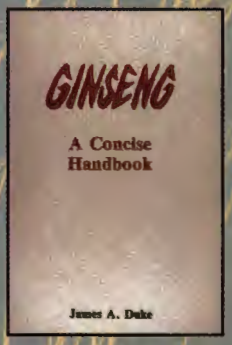


HANDBOOK OF MEDICINAL HERBS
by James A. Duke. 1988. Description and line drawings of 365 folk medicinal species with toxicity tables. Hardcover, 677 pp. $298.95. #B029

DATABASE OF BIOLOGICALLY ACTIVE PHYTOCHEMICALS AND THEIR ACTIVITIES
by James A. Duke. 1992. The *Handbook* on IBM computer disk (Word Perfect 1 needed for database). $205. #B028



BIOTECHNOLOGY FOR ARIDLAND PLANTS
Ed by Tom J. Mabry, Henry T. Nguyen, Richard A. Dixon, and Maureen S. Bonness. 1993. The proceedings from an international symposium to evaluate local, regional, and international strategies for biotechnology developments of aridland plants. Topics range from physiological adaptations and genetic analysis, to marketing of alternative crops. Softcover, 370 pp. $30. #B059



GINSENG A CONCISE HANDBOOK
by James A. Duke. 1989. Applying a healthy scientific scepticism to some of the wilder claims made for ginseng by its growers and devotees, Dr. Duke throws light on exactly what is known about this ancient plant. He examines its history, taxonomy, chemistry, and pharmacology and surveys the economics of ginseng cultivation. Hardcover, b/w illus., 273 pp. $39.95. #B047

THE YEW TREE, A THOUSAND WHISPERS
by Hal Hartzell, Jr. 1991. This book covers yews from mythology to modern medicine. The definitive work on the subject tracing the yew in history, culture, literature, and myth. The modern dilemma: the bark of this tree has recently been used to treat ovarian cancer and is at the center of a struggle between those who want to protect the slow growing, endangered species and the drug companies which require yew bark to make taxol, an experimental anti-cancer drug. Softcover, 319 pp. $19.95. #B066



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HERBALGRAM

The Journal of the American Botanical Council and the Herb Research Foundation

Number 31 • Summer 1994

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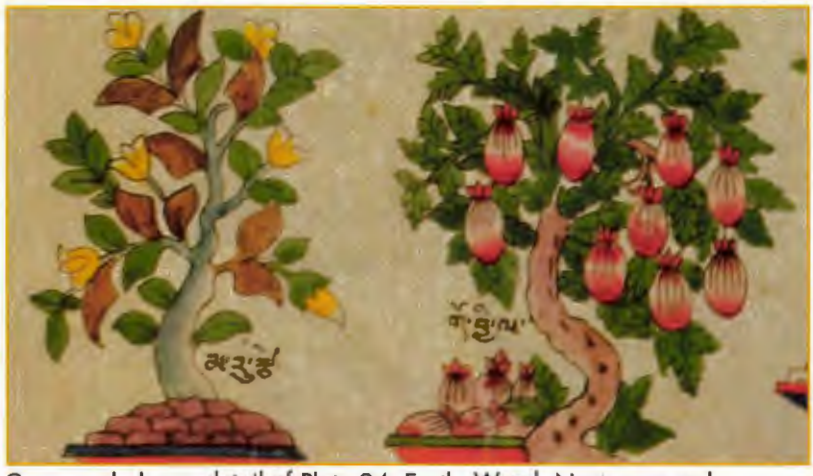

Cover and above, detail of Plate 24, Earth, Wood, Nectarous and Plateau Medications from the two-volume set *Tibetan Medical Paintings*. Reprinted by permission, Serindia Publications, London, U.K. See page 38.

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Dear Reader

Our last issue focused on European phytomedicines. We feel it appropriate to give equal time to simpler traditional medicines. In this issue of *HerbalGram*, we offer insights into the traditional herbal lore of India, Tibet, China, Africa, the Amazon, Japan, and Polynesia, as well as the herbal folk medicine of Mexican-Americans in South Texas.

We show how Amla, a fruit from India, is also used as a medicine in the Ayurvedic tradition. A Western seeker of truth takes us on a tour of a sacred grove, one of the small, richly-diverse and mysterious chunks of woodland that flourish among urban sprawl in many Asian countries.

Our special "book review" by Michael Fallarino features a sumptuous volume of Tibetan Medical paintings which emphasizes the value of honoring traditional systems.

Continuing the theme of traditional healing, we present an in-depth interview with Dr. Oku Ampofo, a Western-trained M.D. who is not only a noted and respected medical leader in his native country of Ghana, but internationally as well.

Our article on the botanical models of Chicago's Field Museum reflects the fact that concern for tropical plant destruction articulated almost a decade ago is at present even more a topic of consideration.

Thousands of herbs have a long history of safe and effective use as traditional medicines. The World Health Organization has published international "Guidelines for the Assessment of Herbal Medicines" (see *HerbalGram* #28). Canada, France, and Germany lead the Western industrialized nations in providing regulatory mechanisms whereby herbs can be sold over the counter for use in many traditional ways. It is now time for an appropriate safety approval system recognizing the historical and cultural uses of herbs to be initiated here in the United States. A new regulatory category for herbs as traditional medicines could offer many health benefits to all Americans and provide benefits for health professionals, the herb industry, and even the FDA.

Mark Blumenthal

Editor

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HERB BLURBS

Herbs Top Growth Category in Supermarkets and Drug Stores!

Sales of herbal supplements rose 70 percent to $22.7 million in supermarkets alone in 1993 and were the second-fastest growing category in dollar sales for food and drugstores combined, according to *Advertising Age* (April 4, 1994). Garlic, the No. 1 segment, rose 67 percent in supermarket sales, while No. 2, ginseng, was up 247 percent.

The top sales for herbs in drug stores for 12 months ending in October 1993 was 57% higher than for the same period in 1992—a dollar increase of $53.1 million according to the January 17, 1994 issue of *Drug Store News*. The information was based on market segments with annualized sales of $12 million or greater. Second in percentage of increase were women's replaceable razors and blades; third were vitamin E supplements.



Herbal Supplements | Women's replaceable razors & blades | Vit. E Supplements

AMERICA VOTES FOR PEPPER!

Forget the polls and surveys and focus groups. There is one sure way of gauging America's changing tastes: Some 32 percent of our total spice consumption today is in black, white, and red pepper. Just 10 years ago, those same pepper products only accounted for a quarter of our spice appetite. In tonnage, the U. S. used a whopping 136 million pounds more of peppery spices in 1992 than in 1982. If that doesn't sound like a lot, consider that a single ounce of black pepper is sufficient to season 1,440 breakfast eggs. And an ounce of hot red pepper goes a lot further than that! (*Spice World*, Vol. 13, #4) [Ed. note—Please note that black and white pepper are derived from *Piper nigrum* (Piperidaceae) while red pepper is an entirely different plant in the nightshade family, *Capsicum* spp. (Solanaceae).]

Yew York

Because of all the interest in the yew tree and taxol, we thought it appropriate to research the origins of the term "yew." Turns out that the evolution of the name began with the original Celtic name for York; that is, *Eburacon*, meaning "the place of the yew trees." During Roman occupation the name was altered slightly into the Latin *Eburacus* (New York is hence *Novus Eburacus* on the official seals of both city and state, on the diplomas of their various universities and graduate schools, and on other ceremonial documents in Latin). The Anglo-Saxons who poured into England after the Roman withdrawal translated *Eburacus* (which meant nothing to them) into *Eoforwíc*, meaning "boar town." To the Viking invaders who followed them this sounded like *Iórvík*. With the passing of time *Iórvík* was shortened to *Iórk*, which finally was transliterated into the contemporary *York*. (Lincoln Barnett, *The Treasure of Our Tongue*, Alfred A. Knopf, 1964)



Yew branch from *A History of the Vegetable Kingdom* by William H. Rhind, p. 473

ETHNOBOTANY AND SAMOAN HEALERS



"Pasture of Palms"
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The ethnobotanical work of Paul Cox, a professor of ethnobotany at Brigham Young University in Provo, Utah, is summarized in the November 1993 issue of *Discover*. Cox's ethnobotanical work in Samoa since the mid-1970s is well-known to many botanists and pharmacognosists. This article does an excellent job in conveying the respect that Dr. Cox, as well as other ethnobotanists, must exhibit and develop with their native healer counterparts in indigenous cultures. The article also points to the wide array of knowledge available from these healers, wherein specific dosages of particular plant parts are given by healers, including directions and contraindications. The article also touches on the issue of intellectual property rights, wherein ethnobotanists are trying to arrange contracts so that a portion of the profits from successful drugs discovered from ethnobotanical knowledge can be returned to the native healers and/or their people.

One of the potential drugs that is being developed from Cox's research is prostratin (from *Homolanthus nutans*), a form of phorbol ester from a Samoan plant. Although phorbol esters are known to have tumor-promoting activity, Cox was successful in convincing National Cancer Institute (NCI) researchers to investigate this plant as a possible anti-tumor agent because of its apparent safe use as a tea by Samoans. In fact, NCI did find potentially positive results, making prostratin a contender for a new type of anti-HIV drug.

This article does an excellent job in presenting various themes that are intrinsic to the issues of ethnobotany: developing communication and rapport with native healers, intellectual property rights and appropriate financial remuneration to natives for their knowledge, "biorationalism" as an explanation for how native healers are able to develop botanical knowledge through observation of animal uses of flora, respect for and awareness of traditional medicine concepts which often focus on spiritual and energetic models, prevention through the use of tonic herbs and foods as opposed to short-term intervention techniques, and so on. More complete information on Paul Cox's work is available in his recently published book, *Islands, Plants, and Polynesians: An Introduction to Polynesian Ethnobotany*, Dioscorides Press. 1991. Available by mail order from ABC Books. (See page 66 for review; page 6 for ordering information.) (Roach, Mary. Secrets of the Shamans. *Discover*, November 1993, pp. 58-65.)

MEDIA WATCH

Study of Attitudes on Garlic Taste and Health Benefits



Garlic, *Allium sativum* ©1992 Steven Foster

Since garlic has become one of the top-selling dietary supplements in the U.S. as well as in Europe, an article, "Garlic: A Sensory Pleasure or a Social Nuisance?" by Rosin, *et al.*, of the University of Health, Helsinki, Finland, is noteworthy. One of the problems associated with the use of garlic as a food has been garlic breath and the negative attitudes toward the odor associated with garlic breath and garlic perspiration. In this study, researchers questioned 100 female and male shoppers in Helsinki and interviewed them regarding their attitudes, beliefs, and norms regarding the ingestion of garlic. In a follow-up questionnaire, these same respondents were measured regarding the annoyance associated with garlic when compared with other common odors. "The three most common beliefs were that garlic has a pleasant taste, that garlic leaves an unpleasant smell on the breath and that garlic is healthy, which together accounted for about 60% of all named beliefs."

The authors note the following beliefs about garlic: "The correspondence analysis showed that users and non-users of garlic held different beliefs. Taste and flavor were most important to occasional users whereas health-related beliefs were common among the most frequent user groups." [Rosin, Susanna, Hely Tuorila, and Antti Uutela, *Appetite*, 1992, #19, pp. 133-143.]

What is "Natural" Medicine?

An article from *The Nation,* a leading magazine of political and social commentary, presents an interesting perspective on the practice of medicine from an M.D. who now practices oriental medicine, including acupuncture and Chinese herbalism. The author notes, "The dirty secret in medicine, however, is that much of our practice today is based not on science, but on the Hippocratic belief in clinical judgment and experience. For instance, physicians know that most Cesarean sections are unnecessary, but that knowledge has not affected the C-section rate. Why? Because physicians don't think any of their own C-sections are unnecessary.

"Medical school is schizoid on the question of science versus clinical judgment. Science is taught in the preclinical years of training, but such an extraordinary amount of unprioritized information is dumped on medical students that they learn promptly to dispense with anything extraneous, including alternative points of view.

"Medicine is a culture of conformity. After five to ten years of sleep deprivation and lack of normal contact with human beings, it is a matter of emotional self-preservation to believe that what we have learned at such costs is not only precious information but the one and only truth.

"Yet Western medical interventions, even when used correctly, kill and maim thousands of people annually. Incorrect use takes an astonishing toll: Medical malpractice alone kills an estimated 45,000 people annually, making it the leading cause of accidental injury and death.

"The majority of doctors prefer not to think about this, even as they perpetuate the litany of myths about alternative therapies: Herbs are poisonous, Vitamin C causes kidney stones, chiropractors paralyze people, acupuncturists lacerate internal organs."

The author makes a compelling argument for why alternative therapies should be considered and compared with unorthodox therapies with respect to serious conditions, especially for autoimmune diseases, AIDS, degenerative diseases and cancer, as there are no panaceas for these major killers in conventional medicine.

The author ends with the following aspiration: "Perhaps one day we will be privileged to have a medical system that encourages humility among doctors, and uses the most benign therapy that is effective for each medical condition." [Fugh-Berman, Adriane, "The Case for 'Natural' Medicine." *The Nation*, September 6-13, 1993.]

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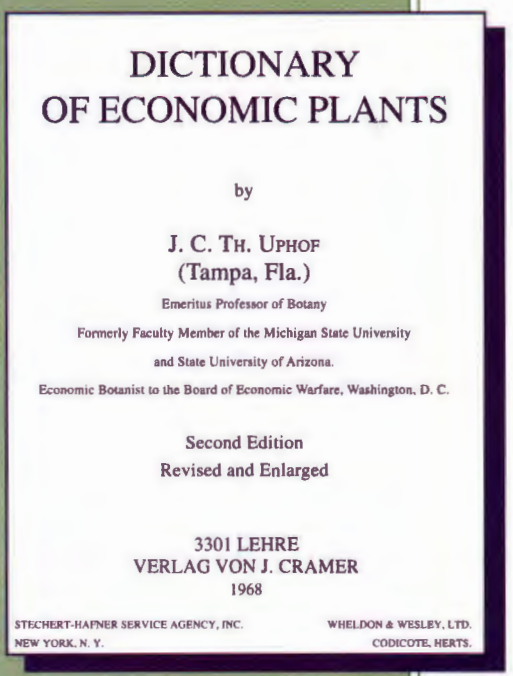
- **Dictionary of Economic Plants** (1968), J. C. Th. Uphof's excellent reference, officially out of print, lists herbs, locales, common and Latin names, and their uses. $60.
- **Marketing/farming articles** by James A. Duke, Ph.D., are available through HRF. These include "Dealers in Botanicals," and ecological requirements for growing 1,000 botanicals. $10.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OF ECONOMIC PLANTS

by

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RESEARCH REVIEWS

HORSE CHESTNUT REDUCES PAIN OF HEMATOMA


Horse Chestnut, *Aesculus hippocastanum.* ©1991 Steven Foster

Medicines made from the horse chestnut tree *(Aesculus hippocastanum)*, are widely used in Europe. Especially popular are topical creams and gels made from the chemical compound escin which has documented anti-inflammatory properties. The efficacy and safety of topical escin (aescin), are evident in 13 prior clinical studies. Bastyr College in Seattle, Washington, conducted the trial to demonstrate the effectiveness of escin gel compared to a placebo in treating the tenderness associated with injection hematomas. This condition is familiar to most people who have given blood or had injectable medications and occasionally developed bruises at the site of injection. Seventy-one subjects took part in the trial, which documented a significant decrease in tenderness and pain after a single application of the escin gel. The authors comment, "It may be possible to extrapolate the results in injection hematoma to other models in which extravasated blood leads to inflammation and tenderness as in impact hematoma" (bruising or blood blisters). [Calabresse, C. and Preston, P., Report of the results of a double-blind, randomized, single-dose trial of a topical 2% escin gel versus placebo in the acute treatment of experimentally induced hematoma in volunteers, *Planta Med.* 59 (1993), pp. 394-397.]

GLA PROVEN EFFECTIVE FOR RHEUMATOID ARTHRITIS

Gammalinolenic acid (GLA) is a major fatty acid found in evening primrose oil, black currant seed oil, and borage seed oil, among other sources. Doctors at the University of Pennsylvania and the University of Massachusetts, working with a pharmacologist from the Philadelphia College of Pharmacy and Science, studied the effectiveness of GLA against symptoms of rheumatoid arthritis. GLA has been widely studied for its effects in lowering blood cholesterol, and plant oils containing GLA, like evening primrose oil, are used medicinally in England and Europe against PMS and eczema. Previous research has shown that GLA is quickly converted in the body to a precursor to prostaglandin E, which has anti-inflammatory and immunomodulating properties. GLA has also been shown to be an anti-inflammatory in animal models, all of which provided the background for this clinical study against rheumatoid arthritis. The 24-week trial was a randomized, double-blind placebo controlled trial at a rheumatology clinic of the University hospital. Thirty-seven patients with rheumatoid arthritis were chosen and tested against cottonseed oil as a placebo. Compared to the placebo, the GLA reduced the number of sore joints by 36 percent, the joint soreness ranking by 45 percent, swollen joint count by 28 percent, and the swollen joint score by 41 percent. The placebo actually caused a worsening of symptoms in some cases. Only half the patients in the GLA group showed "meaningful improvement" in at least four measures, but no patient in the GLA group showed worsening of their condition, while in the placebo group over a quarter of the patients experienced a worsening of their condition. "Patients who completed 24 weeks of gammalinolenic acid treatment showed statistically significant improvement in global assessment by physician, patient assessment of pain, using both the 5-point scale and the visual analog scale, ability to perform vocational tasks, number of tender and swollen joints, and associated tender and swollen joint scores." The authors note that capsules of evening primrose oil and borage seed oil bought in health food stores usually contain about 45 mg of GLA; the amount of GLA used in this study was 1.4 grams per day, or approximately three of the capsules generally available in natural foods outlets.

"The potential regulation of cell activation, immune responses, and inflammation by particular fatty acids is exciting to consider at the clinical, cellular, and molecular levels. A better understanding of how fatty acids modulate function of cells involved in host defense might lead to development of new, benign treatment for diseases such as rheumatoid arthritis that are characterized by acute and chronic inflammation." [Leventhal, L. J., Boyce, E. G., and Zurier, R. B., *Annals of Internal Medicine*, Vol. 119, No. 9, 1 Nov. 1993.]


Evening Primrose, *Oenothera biennis* ©1992 Steven Foster

RESEARCH REVIEWS

RESURGENCE OF KAMPO MEDICINE IN JAPAN



Traditional Chinese herbs used in Kampo Medicine
Courtesy of Tsumura & Co., Tokyo, Japan

Kampo medicine is Japanese traditional medicine modeled after the Chinese tradition and often using the same formulae. Chinese herbalists refer to it as low dose Chinese medicine and it enjoys a rich history of use in Japan. The Ministry of Education, Science, and Culture recently approved the formation of a chair of Kampo at Toyama Medical and Pharmaceutical University. This is a part of a growing official recognition in Japan of the importance of Kampo medicine in modern health care. With the establishment of the university chair, doctors will be able to receive a university degree in Kampo. By current estimates, 70% of Japanese doctors prescribe Kampo drugs as do an even higher percentage of gynecologists (88%) and urologists (83%). Reportedly 100% of younger doctors, in their 30s, routinely prescribe Kampo medicines. Twenty-seven years ago the Ministry of Health and Welfare decided to allow Kampo medicines to be covered by national health insurance. Currently 210 prescription and over-the-counter Kampo drugs are eligible for Ministry approval, with 149 formulations approved for prescription use, comprising a 1.5 billion dollar market. Between 1920 and 1990 the number of doctors in Japan practicing Kampo medicine increased from about 100 to over 6,000. "...Japanese physicians believe that the moment is ripe for an integration of Western and Oriental medicine in treating patients; a blending of East and West in creating a new type of medical approach for the future. For such doctors, Kampo is a medical idea whose time has returned." We can only hope that American medicine, too, will wake up eventually to the safety and benefits of natural remedies. [Ross, C., "New life for old medicine," *The Lancet*, Vol. 342, August 21, 1993, pp. 485-486.]

RESEARCH REVIEWS

ANTI-ALCOHOL EFFECTS OF KUDZU

This study, reported in November 1993 in the *Proceedings of the National Academy of Sciences,* produced quite a stir, when compounds from *Radix puerariae*, a popular Chinese medicine, were found to suppress ethyl alcohol intake in hamsters. The medicinal root, *Pueraria lobata*, known in the Southern United States as the nuisance weed, kudzu, has long been used in traditional Chinese medicine for the management of alcohol abuse. The hamster study, performed at Harvard Medical School, showed that *Pueraria* does indeed suppress ethanol intake, and also identified two major chemical compounds responsible for this action. In the experiment, mice were given a free choice of ethanol or water and tested to see if the pueraria extract would affect their choice of fluid intake. Without medication, the Golden hamster will normally increase its intake of alcohol and decrease its consumption of water to levels detrimental to its health. Some humans have also been known to exhibit such behavior. A crude extract of *Radix puerariae* effectively reduced alcohol intake and increased water intake, both during and after treatment, to a significant extent. To document the validity of the Golden hamster in assessing this anti-alcohol treatment, the hamsters were tested with other anti-alcoholism drugs. "The results clearly indicate that the suppression of free-choice ethanol in the Golden hamster is completely consistent with the beneficial effects of these agents as observed in alcohol-dependent humans."

Radix puerariae was described in the *Pen-t'sao*, one of the earliest Chinese Materia Medica publications around 200 B.C. Its use in treating alcohol-related diseases was first documented in the Chinese Pharmacopoeia of 600 A.D.



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"While you're up, would you bring back the weedkiller? The kudzu has your mother again."

The chemical compounds responsible for the anti-alcohol effects were daidzein and daidzin, which are isoflavones. Isoflavones are known for various other effects, including fever treatment, antispasmodic, anti-hypertensive, and antiarrhythmia agents. This is the first investigation of isoflavones in ethanol drinking behavior. "Results from these studies...will also provide a rationale for the design of much-needed, safe therapeutic agents for alcoholism/alcohol abuse." [Keung, W. M., and Vallee, B. L., "Daidzin and daidzein suppress free-choice ethanol intake by Syrian golden hamsters," *Proc. Natl. Acad. Sci. USA,* Vol. 90, November 1993, pp. 10008-10012]

MORE ANTI-ALCOHOL RESEARCH

The Chinese herbal medicine Xing-Jiu-Ling (XJL), which contains six plants, including *Purearia*, is traditionally used for reducing human alcohol inebriation. This effect was recently tested in "alcohol-preferring rats" at the University of North Carolina's Bio-Medical Research Laboratory. The traditional medicine dramatically reduced alcohol intake by over 50% in one group of rats, and by 100% in another. The authors note that recent unpublished data show that XJL can also counteract both the hypnotic (sleep-time) and discoordinating effects of alcohol in animals. There was no significant effect on food or water intake, nor any toxicity noted, and the animals did not develop a tolerance to the anti-alcohol effects. The authors conclude, "These findings clearly show that XJL reduced alcohol consumption in alcohol-preferring rats, suggesting there might be some potential for this medicine reducing craving in alcohol abusers." [Overstreet, D. H., Lee, Y. W., Rezvani, A. H., Criswell, H. E., Skipper Bowles Center for Alcohol Studies, University of North Carolina, Chapel Hill, NC 27514-7175, Research Society on Alcoholism Symposium 1993]



Kudzu *Pueraria lobata*, © 1994 Steven Foster

RESEARCH REVIEWS

PHYLLANTHUS/HEPATITIS B UPDATE

By Robert McFarland, M.D.

Readers of *HerbalGram* were encouraged by an article entitled, "Cure for Hepatitis B?" in Issue No. 28, page 34, in 1993. The article referred to a very optimistic study in *Lancet* that was co-authored by Dr. Baruch Blumberg, who won a Nobel prize for his discovery of the hepatitis B antigen.[1] The follow-up on this topic is not nearly as encouraging.

Many people who develop hepatitis B infection become chronic carriers of the virus. This allows them to pass on the disease many years later, either by mixing blood through shared needles, transfusions, and dialysis or through sexual relations, rectal and vaginal. Mothers can pass the virus to their children *in utero* and this is how most people become infected worldwide.

People with chronic hepatitis B infection also have the unpleasant possibility of developing post hepatitic cirrhosis and sometimes hepatoma—liver cancer. While lung cancer is the most common malignancy in the developed world, hepatoma is the most common cancer overall in the world because there are so many people with it in developing countries. While lung cancer is 95% fatal, hepatoma is always fatal.

When Baruch Blumberg and co-workers reported in *Lancet* in 1988 that a common plant extract from *Phyllanthus amarus* would clear up the chronic carrier state of hepatitis B, the world sat up and took notice.[1] Blumberg discovered the Australia antigen or hepatitis B virus particle many years ago working in his native Australia.[2] He has since moved to Philadelphia and works at the Fox Chase Cancer Center.

The chemical and tobacco industries were getting chastised and attacked for the rapidly growing incidence of cancer in the industrialized world, so they were quite delighted when Blumberg showed the relationship between hepatoma and hepatitis B virus. Ed Gall had first noticed that hepatoma occurred mainly in people with post hepatitic cirrhosis around 1957, and when Blumberg found the hepatitis B antigen in 1963, it became possible to derive blood tests showing who had been infected with hepatitis B. Almost everyone with hepatoma had chronic hepatitis B infection.

The report by Blumberg and friends in 1988 was carried out primarily in Madras, India, by S. P. Thyagarajan, S. Subramanian, and T. Thirunalasundari, with support and advice from P. S. Venkateswaran and B. S. Blumberg in Philadelphia. These two researchers had been studying hepatitis B infection in woodchucks because these animals respond much like humans to the chronic viral infection. After their initial good results the Madras research team repeated their study and the healing effect of *Phyllanthus amarus* was not as impressive in the second controlled study. The herb didn't help woodchucks with hepatitis B in Philadelphia either. Then research teams in Mahidol, Thailand and Rotterdam, the Netherlands, reported their controlled trials with *Phyllanthus* and found it no better than placebos in treating hepatitis B carriers.

Dr. Vankateswaran was discouraged when I spoke to him in early November, 1993, and referred me to Dr. Sandy Milne of the Hepatitis Research Unit in Whakatane, New Zealand. Dr. Milne has been in Boulder and was most eager to describe his work in studying *Phyllanthus amarus*. He had just sent his results to the New Zealand Medical Journal for publication after spending two years and half a million dollars of New Zealand tax money on their studies. He gave the treatment group Geranian which is the antiviral agent in *Phyllanthus* and he also found it was no better than placebo. Because *Phyllanthus amarus* is widely used, safe, and cheap, there would be a tempting tendency to advocate its further study and possible widespread use.

There is an effective hepatitis B vaccine that works best when given intramuscularly to children. (This hurts and costs a lot.) The administrative problems with giving the vaccine to children in the developing world who need it the most are a long way from being solved.

So important is hepatitis B infection that China is considering new rules that would advise women with chronic hepatitis to "halt the pregnancy" as a means to "avoid new births of inferior quality and heighten the standards of the whole population."[3] In the United States little concern has been expressed publicly about five people who died in 1993 while taking an experimental drug called Fialuridine (made by Lilly) for chronic hepatitis B infection. Two more of the experimental subjects had to have liver transplants. When Ralph Nader's medical auxiliary, Public Citizen's Health Research Group, complained to the FDA, Edward West of Lilly called the assertion "that we covered up data...irresponsible and inaccurate."

1. Thyagarajan, S. P., *et al.* Effect of *Phyllanthus amarus* on chronic carriers of hepatitis B virus, *Lancet*, 1988, ii, 764-6.
2. Blumberg, B. S., *et al.* A "new" antigen in leukemia serum, *JAMA* 191:101, 1965.
3. Mufson, Steven. "China will use marriage bans to halt 'inferior quality' births," *The Denver Post*, Nov. 24, 1993.

FLAVONOIDS IN THE NEWS

Many of the most popular herbs sold today owe their activity to flavonoids. Examples include bilberry, ginkgo, milk thistle, pine bark extract, grape seed extract, and others. Flavonoids are also common in citrus fruits, onions, apples, and in tea. The National Institute of Public Health in the Netherlands reports that overall flavonoid intake in 805 men, ages 65 to 84, was protective against cardiovascular disease. The relative risk of coronary heart disease mortality in the group who consumed the highest levels of flavonoids versus those consuming the lowest was 42%. After adjusting for age, body weight, smoking, blood pressure, coffee consumption, fiber, and other factors, there was still a 32% reduction in cardiovascular disease risk. This is the first study to provide clear evidence for physiological benefits of flavonoids in human beings. The highest intake of flavonoids in the study was from tea rather than from fruits or vegetables, further emphasizing the potential health benefits of the switch from coffee to tea or of consuming green tea extracts. [Hertog, M. G. L., Feskins, E., Hollman, P., Katan, M., & Daan Kromhout, D. "Dietary antioxidant flavonoids and risk of coronary heart disease: the Zutphen Elderly Study," *The Lancet*, Vol. 342, pps 1007-1011. Oct. 23, 1993] ❑



Fieldworkers in Egypt gather chamomile. Photo by Rob McCaleb.

Bring Nature Back into Modern Health Care!

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The Herb Research Foundation is working to bring herbs back into health care through science and education. HRF educates lawmakers, scientists, and the public with *facts* about the safety and effectiveness of natural health care. HRF helps to *prove* that herbs can improve world health and welfare in its role as a major center of herb documentation, research, and education. HRF reaches millions of people every month, from the layperson to the lawmaker, with reliable information about herbs for health. When we start *growing* more of our medicine, instead of making synthetics, we can achieve:

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Model of **Water Hyacinth**, *Eichhornia crassipes*.
Courtesy © The Field Museum,
Neg# B-83213c, Chicago

The Botanical World in Replica

THE STORY OF FIELD MUSEUM'S ASTONISHING COLLECTION OF PLANT MODELS

by Michael O. Dillon and Beverly Serrell

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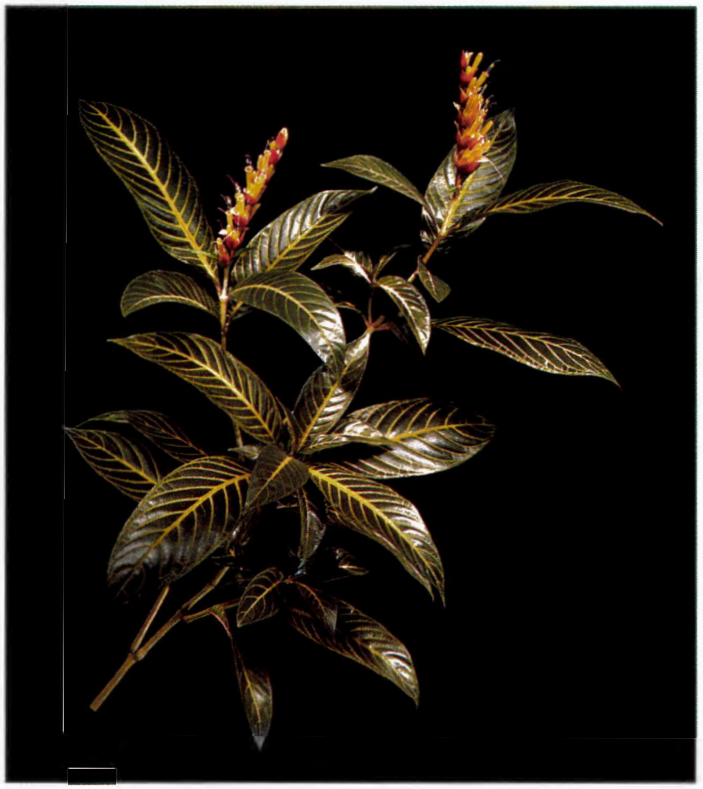

Destruction of the world's tropical and subtropical forests is occurring at an accelerating and alarming rate; more than 35 acres of forest are being destroyed every minute in logging activities and land clearing for agriculture. Much of this destruction is due to profit-seeking ventures, but a lack of appreciation for these ecosystems is contributing to the steady loss of one of our major resources. Because of the general inaccessibility of tropical forests, few people have visited them, though many have had brief glimpses in botanical gardens or while viewing nature programs on television. The inadequacy of methods for exhibiting plant forms in museums has been a major obstacle to developing this education medium—one that has great potential for increasing public awareness and appreciation of plant life. Because most museums lack the resources for making plant models, it is generally not feasible for them to produce satisfactory exhibits of plant forms as they appear in nature. Chicagoans are very fortunate, however, in having an extensive botanical model collection at Field Museum.

Model of **Sanchezia**, *Sanchezia nobilis*.
Courtesy © The Field Museum,
Neg# B-83225c, Chicago

Plants of the World, one of the Museum's four largest halls, will allow visitors a unique opportunity to examine in model form many examples of tropical plants as well as temperate plants familiar to Chicago area residents.

On November 1, 1893, barely six weeks after the founding of Field Museum (then called Colombian Museum of Chicago), Charles Frederick Millspaugh became the Museum's first curator of the Botany Department, a position he continued to hold for nearly 30 years. Around Ithaca, New York, Millspaugh's birthplace, he had been known as the "boy naturalist." Though he had completed training to enter the medical profession, he abandoned this to pursue his consuming interest in botany. Under Millspaugh's guidance, the Botany Department took shape, his special interest in economic botany and tropical plants lending a direction and influence that continues to this day.

The Museum had acquired from exhibitors at the Columbian Exposition a formidable collection of timbers, oils, gums, resins, fibers, fruits, seeds, and grains; not included in this assemblage were living plants, which Millspaugh viewed as a major deficiency. So around 1896 he originated an exhibit concept that would ultimately solve this problem as well as revolutionize the development and production of botanical exhibits.

Millspaugh hired B. E. Dahlgren in 1909 to head a facility for producing plant models of exacting fidelity. An accomplished model-maker with professional experience in making dentures, Dahlgren was accustomed to working with wax, glass, and celluloid. The first plant reproductions completed by Dahlgren's team included the breadfruit and papaya models—the beginnings of one of the most impressive collections of plant models in the world.

From the start, these creations sparked the interest of the public as well as scientists. The story is told of a distinguished foreign scientist being escorted by Millspaugh through the botany halls. Upon seeing some of the plant models, the visitor remarked, "It is very nice, but you cannot conduct



Above, **Cannonball Tree** model, *Couroupita guianensis*, the largest in the Museum's collection of plant reproductions. Courtesy © The Field Museum, Neg# B-49337, Chicago.
Below, Preparator Emil Sella (1944) puts finishing touches on model of **Welwitschia**, *Welwitschia mirabilis* Hook.f. Courtesy © The Field Museum, Neg# B-80027, Chicago.



a museum so! You cannot put in a plant, and when it wilts and fades put in another! It cannot be done."

"But these plants," replied Millspaugh, "do not wilt or fade. They last forever. They are artificial."

The scientist looked closely and exploded. "No! It cannot be! Yet, it is! My, but this is wonderful."

In addition to models of large flowering trees, herbs, ferns, and fungi, many tiny, intricate glass models of diatoms and algae were also constructed. Millspaugh termed these displays the "substitute for the microscope in museum installation." Indeed, the viewer can enjoy in these minute forms a singular beauty that is usually the exclusive viewing pleasure of the microscopist.

The plant model shop was initially located several miles from the Museum, on Jefferson Street, and during its first five years, the staff was busy creating models of plants from the tropics and subtropics, because these areas offer the greatest diversity of species. Expeditions continued through the years to obtain plants from regions such as Jamaica and Guiana (Guyana, Surinam, French Guiana, and neighboring regions) that are especially known for their species richness. In 1914 the shop was closed for two years due to the impending hostilities of World War I; but in 1916, before the United States entered the war, Museum President Stanley Field personally undertook the financial responsibility of reopening the shop. It became very active, producing hundreds of models representing plants from all over the world. During a seven-month period in 1919-20, the lab was moved to Miami, Florida, to continue the production of tropical models. At first designated the Sara C. Field Laboratories in recognition of the support of Mrs. Stanley Field, the name of the facility was changed in 1922 to that of her husband.

The depression of the early 1930s had the effect of budgetary cutbacks at the Museum, but the Work Projects Administration (WPA) gave the institution new life. Between May 1935 and June 1941 nearly 1.5 million man-hours were contributed by WPA workers, a share of this in the reproduction lab. During this period many of the spectacular ecological settings were completed, including the alpine diorama and that of the giant water lily. During World War II, the production of models again was curtailed, but with the beginning of the postwar period, the staff was enlarged and production again increased. It was also during this period that the greatest effort was made towards the improvement of existing displays by replacing photographs of plants with models.

The new exhibit is designed to present a general view of the plant kingdom, including fossil as well as living plants, algae to orchids, with more than 600 species represented. The flowering plant models comprise the bulk of the collection, and many of these have been chosen for their importance to mankind or for some other particularly interesting feature. Also included are representatives of nearly 30 percent of the approximately 370 plant families, with examples of all major taxonomic groupings. Most of the models are life size and represent the entire plant. The cannonball tree and banana plant models, each over six feet tall, show the plants in their natural "poses"—planted in the soil, with dead as well as new leaves on the plant.

Before a model was constructed, detailed watercolors were painted, field notes taken, and photos made of living plants in their natural habitat. The collected specimen was dissected and plaster of Paris molds were made in the field of plant parts, such as leaves and flowers, while still fresh. These preliminary molds were subsequently used in the laboratory in the preparation of glass or metal molds. Plant material, preserved in fixative, was stored in jars until required for study during the final stages of model preparation. Often, large trunks, stems, or fruits were shipped back to Field Museum at considerable expense and effort.

The materials of which the models were fabricated changed over the years. In the early days of the laboratory, latex, glass, wire, and various waxes were the standard building materials. After World War II, plastics became more commonly used. Techniques for compression and injection molding, which produced lifelike results, were developed. The most exquisite examples of the laboratory's work may be seen in the 65 enlarged floral model cross-sections and in such floral details as long, filamentous stamens. Regret-tably, much of the information gained in the laboratory about pigments and production techniques was never recorded and is now lost.

With time fast running out for many of the world's tropical plant habitats, *Plants of the World* will serve students, educators, and the public as a source of beauty and interest; and, it is hoped, will lead to better protection and management of our natural resources. ❑

Michael O. Dillon is Curator of the Botany Department at Field Museum of Natural History. At the time of this article's original publication, Beverly Serrell served as educational consultant, Department of Exhibition.





Above, Model of **Medinilla**, *Medinilla magnifica*, Courtesy © The Field Museum, Neg# B-83219c, Chicaago. Below, model of **Annatto or Lipstick Tree**, *Bixa orellana*, Courtesy © The Field Museum, Neg# B-83215c, Chicago.

ASIA'S SACRED GROVES

DAZZLED BY EVIL GIANTS AND FLYING MONKEYS, A WESTERNER SEEKING HIGHER TRUTHS ASKS WHY THESE HOLY FORESTS SURVIVE

By Paul Spencer Sochaczewski

Man-god-king Rama attempts to rescue his wife, who has been kidnapped by the evil giant Ravana. In the ensuing battle, Rama and his loyal brother Lakshmana fall mortally wounded. The only treatment: four medicinal plants that grow 2,900 kilometers (1,800 mi.) away in the high Himalayas. Enter Hanuman, the flying monkey general. He takes off from what is now Sri Lanka and soars to the medicinal plant mountain in northern India. When he gets there, Hanuman cannot decide which are the right plants. In a fit of frustration he rips out the entire mountain, which he personally airfreights back. The mere smell of the plants cures the brothers, thereby enabling them to defeat the evil enemy. To replace the mountain, Hanuman flies back with it on his shoulder, but bits of earth fall off. Where these clumps land, sacred groves and holy forests appear.

Summarized and updated from the "Exploits of Hanuman" in the Ramayana, *a 2,000-year-old Hindu epic.*

A grove of trees in the middle of Perumbavoor in the state of Kerala is one of the last remnants of virgin forest in south India. Covering only 10 hectares (25 acres), the grove is just a dot in the urban landscape. But to people in this part of the world, this wood is sacred.

To get there, you pass along a bustling road where traffic blows exhaust fumes past the offices of Decent Cargo Movers, the Ruby Coold [sic] Bar, and Creative Computer Services, whose sign announces: "Kick off your headache, we got the solution." As you enter the grove, the air suddenly turns rich with the scent of wild cinnamon. Trees a yard wide block the midday sun. Bird song replaces motorcycle squeal.

Throughout Asia, there are perhaps thousands of small chunks of original woodland exactly like this—rich, diverse, mysterious, and intact places that often flourish amid urban sprawl and village development, protected spontaneously by the people who live there. These sacred groves and holy forests are sprinkled liberally across India, Sri Lanka, Southern China, Thailand, Burma, and other parts of Indochina.

For 15 years, I have been on a personal quest to determine the significance of these unique wild areas, journeying physically across Asia and philosophically a world away from my Western

Continued on page 24

Facing page, Hanuman, monkey general in the Hindu epic the *Ramayana*, shoulders the medicinal mountain and rushes to save the wounded god-king Rama. On the return trip, bits of the mountain fall off, sprouting into lush forests, revered in Asia to this day. 07.271 folio 236r, Courtesy of the Freer Gallery of Art, Smithsonian Institution, Washington, D.C.





SACRED GROVES SEEM TO BE A POTENT COMBINATION OF DRUGSTORE, WATERSHED, INSURANCE POLICY, AND SPIRITUAL RETREAT.

culture. In the process, I have learned how legend, religion and community culture can combine to provide non-Western answers to thorny modern conservation problems.

The legend of Hanuman, the monkey general, has significant practical meaning, I discovered. After visiting dozens of sacred groves and meeting with numerous Eastern philosophers and religious leaders, I began to understand how well-intentioned Westerners might do well to apply some Eastern philosophy to their conservation activities.

Sacred groves, like many nature reserves in the tropics, provide lifesaving medicinal plants. The people of India, like 80 percent of the developing world's inhabitants, get their primary health care from so-called traditional medicine. Here, this "traditional" approach is sophisticated and backed by 3,000 years of empirical study. The Indian Ayurveda medical system (the word comes from Sanskrit and means "the science of life") uses herbs, minerals, and animal parts—along with a healthy dose of meditation and "right living"—to treat a variety of illnesses and disorders.

In Perumbavoor, which receives some 10,000 pilgrims each year, I wander through the sacred grove with Forest Range Officer N. C. Induchoodan. "This forest is God's own pharmacy," he says. Just to our left he points out medicinal plants used to treat diabetes. He examines the ground and finds a plant that battles asthma. Above us grows a creeper that reduces fevers. Every plant, it seems, has medicinal properties. There are plants for treating hypertension and malaria, upset stomachs, infections.



During a battle in the *Ramayana*, Sugriva the monkey king attacks an evil giant, whom Rama slays with a celestial arrow. Enraged, the demons seem poised to defeat the god-king. One hope remains–Hanuman. 07.271, folio 220. Courtesy of the Freer Gallery of Art, Smithsonian Institution, Washington, D.C.

Western conservationists are fond of using this "natural drugstore" argument for saving nature. As powerful as the argument is, however, I become more intrigued by a social question. Were sacred groves first "created" by people who recognized the forests' medicinal bounty and ecological values? Or did people create sacred groves out of some deep need to respect Nature and there by become one with Her power?

The answer depends on whether you ask the question from a Western or an Asian perspective. It also depends on how willing you are to allow your Western mind to perform mental acrobatics.

"Three thousand years ago this whole region was forested," says M. Prakash, priest of the Perumbavoor temple. "Inside the temple—no, you can't go in there—is a stone that people say is in the image of Durga," he explains, referring to the consort of Shiva, one of Hinduism's three most important gods. "This stone miraculously bled when some women who were cutting grass accidentally hit it with their knives. From that day the women worshipped the rock, and people believe that the trees here are the hair of the goddess. Nobody has disturbed this area since."

I ask V. Rajendran, a newspaper agent who worships almost daily in the Perumbavoor grove, what might happen to someone who upsets Durga, an ancient incarnation of the Earth Mother goddess. We sit down on the fallen yard-thick trunk of a hardwood tree that would have long been cut for timber had it grown outside the sacred grove. Rajendran has an anecdote ready. Several years ago, he says, without permission from the priest, a man at the grove collected seeds of the medicinal plant *Vateria indica*, used for treating chronic rheumatism and other disorders.

For ten years after that act of disrespect, the man was plagued by financial, medical, and personal problems. Perhaps even more disturbing, after his intrusion the *Vateria indica* bushes in the grove refused to flower. The man ultimately repented by offering the goddess an amount of gold equivalent to the weight of the seeds he had stolen. Durga was appeased, nature's balance restored.

As I continue my quest, I get a better feel for these special places, though I also continue to ask "why?" My questioning is seen as admirable truth seeking by my Western colleagues, but it merely bemuses my Asian associates.

I ask one of the wisest men I know, Vithal Rajan, founder-chairman of the Central Indian Deccan Development Society, how the concept of sacred groves might have started. "You find sacred places everywhere," explains Rajan, who is also Director of Education and Ethics for the Swiss-based World Wide Fund for Nature. "Stonehenge, the Aboriginal songlines. They're the meeting place of culture and nature."

This clearly is not going to be a one-minute answer. Rajan walks me through the Hindu/Buddist philosophy that life consists of three parts—*artha*, which is the husbanding of wealth and physical comfort; *kama*, the search for aesthetic, sexual,and physical pleasure; and *dharma*, the acknowledgment of justice, peace, and spiritual harmony. Above these precepts is *moksha*, liberation or nirvana, which comes once you understand the linkages among the physical, spiritual, and natural worlds.

I must look bewildered. Like a true teacher, Rajan reframes the argument. "Let me put it another way. Modern science recog-

nizes two basic forces—matter and energy. Asian philosophy adds a third power—consciousness. And one of the ways this third force is represented is through the sixth sense—feminine intuition, or communication with animals and forest spirits or other seemingly 'unscientific' phenomena. Sacred groves combine the pragmatic and the spiritual. Don't ask only Western questions."

What could be less Western than China? I decide to visit a hilly and isolated autonomous region called Xishuangbanna. This is in the extreme south of China's Yunnan Province, which juts into Burma and Laos. The region encompasses the world's northernmost tropical rain forest, where a mix of "minorities" follow traditions not dissimilar to those of their hill-tribe cousins in northern Thailand, Burma, and other parts of Southeast Asia.

To the untrained eye, the woodlands of Xishuangbanna appear indistinguishable from other forests nearby. But to local villagers, the 400 "holy hills" are the homes of dragons. They are sacred forests which provide for people's spiritual and physical well-being.

Physical well-being in China is no different from physical well-being anywhere else. People get sick; they go to the doctor. I sit with Doctor Bo Wan Kan and his female patient on a bouncy split-rattan platform at the back of his village house. He diagnoses the woman's illness by feeling her pulse and sensing the flow of energy in her body. He asks a few questions and then unwraps some of the treasures of his personal pharmacy: sawdust, twigs, crumbled leaves, crushed roots. The dried head of a soft-shelled river turtle.



Stumped in his search for healing herbs, Hanuman hauls the entire medicinal mountain to Rama's men, who rally to the aroma. Today, as then, sacred groves serve as vital repositories of lifesaving plants. 07.271, folio 234v. Courtesy of the Freer Gallery of Art, Smithsonian Institution, Washington, D.C.

Bo Wan Kan, of the Dai tribe, one of the 23 Chinese minorities in Xishuangbanna, practices traditional medicine with plants and animals he collects from a nearby forest. But right behind his home is the "white elephant" sacred grove, so called because of the pachyderm statues guarding the temple's entrance. The grove provides life insurance for the village. It is a repository of medicinal plants which could be collected in an emergency if the supplies outside the forest disappear.

As in other forested hillsides, the dragon hills provide what eco-economists are fond of calling "environmental services." The sacred forests harbor wildlife, including many bird species that eat insects which would otherwise eat the villagers' rice crops. Perhaps most important: the sacred forests also act as watersheds, ensuring a regular flow of clean water throughout the year.

To help me understand the origin of sacred groves in the Chinese Buddhist context, I seek out Professor Pei Shengji, director of the Kun Ming Botanical Institute and one of China's leading ethnobotanists. "Like many early groups, the Dai associated the forests, the animals and plants that inhabited them, and the forces of nature with the supernatural realm," Pei explains. "Proper actions and respect for the gods were believed to result in peace and well-being for the villagers. Improper activities and disrespect, on the other hand, incurred the wrath of the gods, who punished the Dai villagers with misfortunes. Thus, the early Dai were encouraged to live in 'harmony' with their surroundings. The holy hill is a kind of natural conservation area founded with the help of the gods, and all animals, plants, land, and sources of water within it are inviolable."

Finally, the pieces of the sacred grove puzzle begin to form a picture for me: Sacred groves seem to be a potent combination of drugstore, watershed, insurance policy, and spiritual retreat.

Perhaps of greatest interest to me as a conservationist is the fact that most sacred groves survive as protected areas. I have spent years encouraging governments to establish reserves through legislation. Unfortunately, many of these externally imposed sanctuaries fail because they don't have community support.

To encourage such support, many in the conservation movement try to figure out ways to give villagers "community empowerment." The idea is to create respect for reserve boundaries by involving local people in decision making and by enabling them to benefit directly from conservation. Unfortunately, as noble as it sounds, "community empowerment" still smacks of paternalism, which many people in the developing world justifiably resent.

I find it both ironic and hopeful that sacred groves, representing some of the most successful Asian "conservation programs," have in many cases already cut out the middleman—in this case the government. Sacred groves, or "life reserves," as one villager described them, survive today without benefit of government gazettement, nature wardens, education centers, and sometimes even without government goodwill.

But all is not perfect in paradise, as I learn when I visit a private sacred grove in the Kerala town of Changanacherry in southern India.

Botanist N. C. Nair takes me to a sacred grove in the backyard of a relative's home off a busy commercial street. Each evening, the family matriarch enters the 96-square-meter (120 sq. yd.) grove, pushes away brambles and lights a flame in front of a knee-high stone *naga* (cobra) statue.

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AMLA

Traditional FOOD and MEDICINE

by Linda Treadway, Ph.D.

The Amla fruit, (*Emblica officinalis*) small and innocuous-looking, is worthy of consideration by the serious herbalist. It grows wild and is also cultivated in the forests and seacoasts of India and Kashmir.

Amla has long been recognized as a stalwart member of the family Euphorbiaceae with literally hundreds of uses. The Amla shrub grows into a small or middle-sized deciduous tree with feathery leaves 10-13 mm long and 2-3 mm broad. Male and female pale green flowers appear on the same tree and the juicy, green, fleshy fruit grows to over 2 cm with six softly defined ridges and six seeds.[1] Cultivated fruits weigh approximately one ounce, while the wild berry grows to only half that size.

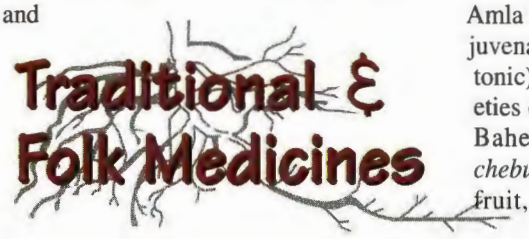
Medical studies conducted on Amla fruit suggest that it has antiviral properties and also functions as an antibacterial and antifungal agent.[2] The Amla berry holds a place of esteem in traditional Asian medicine, even though it is only now becoming known in the West. Amla forms the base for an ancient herbal restorative tonic known as chayavan prash. Approximately 5,000 years ago, the formula, which contains 34 herbs and fruits plus aromatic spices, clarified butter, sugar cane juice, and honey, was recorded in the Ayurvedic medical texts as a Rasayana or supreme rejuvenative tonic.[3] The gelatinous plum-sized Amla fruit contains between 700 and 1,000 mg of heat-stable vitamin C.[4] Because of its tartness, the Amla fruit is a good liver stimulant; the fruit is cooling and mildly laxative. Experiments conducted on patients with pulmonary tuberculosis showed that the natural vitamin C contained in the Amla berry was more quickly assimilated than synthetic vitamin C; a finding that "certain unknown factors in the fruit may be responsible for this advantage." [5]

Experiments conducted at the Niwa Institute of Immunology in Japan have shown Amla to be a potent scavenger of free radicals, the stress-related reactive oxygen-based ions which clutter up an unhealthy body. With an excess of free radicals, the body may become prey to auto-immune processes, destroying and degenerating its own tissue structure. The Niwa Institute of Immunology studies showed that Amla preparations contained high levels of the free-radical scavenger, superoxide dimutase (SOD), in the experimental subjects. Further survey of the medical literature shows that the Amla berry, either in combination with other herbs or alone, has been useful in the amelioration of anemia, diabetes, chronic lung disease, colds, influenza, hypertension, elevated cholesterol levels, and even as an immune restorative in cancer treatment.[6] Additional clinical research has been conducted on Amla's positive effects on the body, which include enhanced cellular regeneration, increase of lean body mass, and enhanced production and secretion of interferon and corticosteroids.[7]

The Amla berry can be identified as a mainstay of Ayurveda, classical East Indian medicine. Ayurveda is an original holistic system of diagnosis and treatment, including nutrition, hygiene, rejuvenation, and plant and herbal medicine developed and perfected in India over 5,000 years ago. Ayurveda is an entire science of healthy living, perfectly compatible with the present shift in the awareness of our Western population toward the practice of preventive health leading to wellness.

According to Ayurveda, the human constitution as well as the entire environment is composed of five basic elements: earth, water, fire, air, and space. In an ideal situation, these five basic elements exist in a perpetual dynamic harmony, creating life, good health, and the perfection that is living creation. Ayurveda undergoes a further theoretical refinement when it identifies the functional triad known as the Tridosha, or three great basic factors governing human life (Water, Fire, and Air). Healing occurs when the dynamic harmony of the doshas is restored. Disease can only occur when there is an abnormal affliction, an imbalance in one, two, or all three of the elements or doshas. Traditionally, Amla has been called the best of the Ayurvedic rejuvenative herbs, because it is tridosaghna, that is, through its natural balance of tastes (sweet, sour, pungent, bitter and astringent) all in one fruit, it stimulates the brain to rebalance the three main components of all physiological functions, the water, fire, and air elements within the body.[8]

Amla Berries form one-third of the colon rejuvenation tonic called *Triphala* (three-fruits tonic). India has produced these three varieties of gooseberry fruit: Amla, Harde, and Bahera. Harde or Harada (*Terminalia chebula*) is a warming variety of gooseberry fruit, known for its yellow-green color.



Bahera (*Terminalia belerica*) is a smaller, more astringent variety. The traditional proportions of fruits in this tonic are: two Amla berries, one Harde berry, and four Bahera fruits. *Triphala* is laxative and is often used to correct intractable constipation and other colon problems. Its real value lies in its properties as a general tonic. *Triphala* is traditionally used for at least 1 year.[9]

In addition to being a traditional medicine there are many other uses for Amla berries. The confection chayavan prash is baked into small cookies which are wrapped in edible silver foil and served as a holiday dessert. Sherbets and fermented beverages are prepared from the same fruits. Amla is mixed with buttermilk for anointing and "cooling" the head. Decoctions of the leaves and seeds are used in high fevers and in the treatment of diabetes mellitus. Pickles which promote good digestion are made from green Amla; shampoos and hair preparations are made from Amla fruit as well as are massage oil preparations. Amla juice, *Piper longum,* and honey are used to calm hiccups. A decoction of the leaves is used as a chemical-free bactericidal mouthwash. A cold infusion of powdered Amla is used as an eyewash. Amla powder with red sandalwood (*Pterocarpus santalinum*) is used with honey to relieve nausea and vomiting. Amla wood is highly water resistant and is used for boats, bridges, and wells. Tannins found in Amla make superior inks and dyes.[10] ❑



Amla, *Emblica officinalis.*
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permission from *Yoga of Herbs,*
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The Amla berry can be identified as a mainstay of Ayurveda, classical East Indian medicine.

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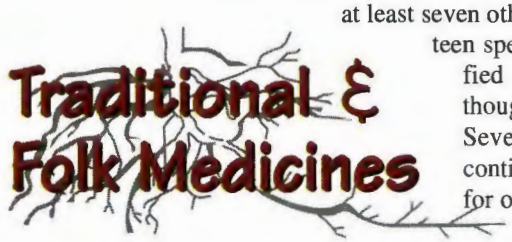
The Story of JIN BU HUAN: Chinese "Drug," Not Herb

by Subhuti Dharmananda, Ph.D., Director, Institute for Traditional Medicine (ITM), Portland, Oregon

Government concern over the misuse of a Chinese patent medicine and FDA intervention in its importation have created public confusion in perception of the herbal industry by suggesting that this item is an herbal product. Jin Bu Huan is not *an herbal product; it is a drug made from a plant-derived alkaloid.*

Jin Bu Huan (JBH) is the name of a plant-derived product from China that has been popular in the U.S. for the past decade, at least among those familiar with such things. The product consists of one single ingredient, derived from two traditional Chinese herbs. However, JBH itself is not *an herbal product. Its use as a sleeping aid and analgesic was a quiet matter until 1993 when a peculiar set of circumstances brought it to the attention of the Food and Drug Administration (FDA). Three young children in Colorado, in isolated cases, all got hold of tablets of JBH and took massive overdoses, one thirteen-month-old child consuming as many as 60 tablets.[1] Although all three recovered within a few hours—from the deep sleep that results in children, but not in adults who get overstimulated instead from taking such quantities—the convergence of these three cases led FDA to deem it a dangerous product, which would have to be removed from the market. Official action against the product was accelerated when, just a few months later, three cases of liver inflammation attributed to ingestion of JBH were reported by a physician in Los Angeles.[2]*

The JBH consumed in overdose was analyzed by a Colorado State University laboratory and found to contain a single plant-derived ingredient*: the alkaloid l-tetrahydropalmatine, representing 36% of the tablet,[1,3] the rest being neutral starch. Thus, JBH differs from most herb products in that it is a purified chemical compound, and so has some of the same potential problems that occur with pharmaceutical products. Most users of JBH had assumed it was a typical herb compound, made up of dozens of natural components, even though the English-language label plainly states that it contains 30% alkaloid and 70% starch. The single alkaloid composition of JBH apparently was not understood by most of the prescribers and consumers of the product, which may have led to less caution with its use.*



HISTORY AND SOURCE

Tetrahydropalmatine (THP) was first described as a constituent of a Chinese herb in a German report published in 1923.[4] For purposes of historical reference, this was the same year that a German study[5] about another alkaloid from a Chinese plant—ephedrine—established a new drug of choice for treatment of asthma. (A second ingredient in the same plant—pseudoephedrine—is today produced synthetically to yield the primary sinus congestion remedy that does not cause drowsiness.) Virtually all over-the-counter *herb* remedies for hayfever and sinus congestion contain the original source material or a related species of *Ephedra*. These alkaloids are part of a long history of deriving useful remedies from East Asian herbs. In fact, the first isolation of an alkaloid was morphine from opium poppy, long used in Chinese medicine; the finding was reported in 1817 by a German researcher.[5] THP belongs to this rich tradition of pharmacological research, though it has not, until recently, been well publicized.

Many alkaloids affect the nervous system. This is because, like plant alkaloids, neurotransmitters contain an active nitrogen molecule that influences binding to receptor sites. The impact of alkaloids on the nervous system may vary with dosage; for example, a low dose may stimulate the nervous system while a high dose may sedate it. In fact, some alkaloids are fatal in overdose by inducing paralysis of the respiratory control center. Because of the complexity of the nervous system, alkaloids can have paradoxical effects, causing stimulation or sedation not only at different doses, but among different individuals who use them, or even under different circumstances of use. Caffeine and ephedrine are alkaloids best known for their strong stimulatory action, while morphine and reserpine are well-known for their sedative actions.

The original source of THP in pharmacological research[6] was the tuber of *Corydalis turtschaninovii* Bess., commonly called corydalis (Chinese: *yanhusuo* or *yuanhu*). It is also derived from at least seven other related species.[7] As many as thirteen species of *Corydalis* have been identified as being used by herbalists in Asia though not all of them are called *yanhusuo*. Several of these plants have been used continuously in Chinese herbal medicine for over a thousand years.

Isolation and characterization of THP from various sources continued for about a decade after the initial work, primarily in China and Japan, as part of a concerted effort to use Western methods of analysis to reveal the nature of traditional remedies. By 1960, the isolated compound had already gained use in clinical trials for treatment of pain, and alternative sources of THP, such as various species of *Stephania*, notably *Stephania rotunda*, had been identified.[8] *Corydalis* species contain *dl*-tetrahydropalmatine, while *Stephania* species contain only *l*-tetrahydropalmatine;[9,10] both genera of plants produce other alkaloids that have similar pharmacological actions, though different potencies.[4]

CHEMICAL CHARACTERISTICS OF TETRAHYDROPALMATINE

THP is an isoquinoline alkaloid, one of many such compounds that are known for analgesic and tranquilizing properties. Within that large group, this compound belongs to the protoberberine series. Alkaloids in this series are used extensively in the Orient,[8] mainly for the treatment of infections (e.g., berberine), cancer (e.g., berbamine), and pain (e.g. stephanolide and THP). They are characteristically yellow, have four linked benzene rings with a nitrogen atom joining two ring pairs, and are modified variously via two oxygen atoms at each end. THP may owe some of the strength of its physiologic effects, compared to closely related structures, to its symmetry and to its solubility in fat (a property conferred by the four terminal methyl groups shielding each oxygen atom). Corydalis yields a total of 0.59% to 0.74% total alkaloids[11], of which there are about a dozen.[7] *dl*-Tetrahydropalmatine content of corydalis is not specified, but is estimated to represent only about 0.2% by weight of the corydalis tuber. *Stephania rotunda* roots have a total alkaloid content of about 1.2% and may have as much as 0.5% by weight *l*-tetrahydropalmatine.

ACTION OF TETRAHYDROPALMATINE

The physiological effects of THP are essentially the same as those of the herb corydalis, which is analgesic, sedative, tranquilizing, and slightly hypnotic.[12] The herb contains a number of other protoberberine series alkaloids with similar effects, as well as protopine series alkaloids.[4] Corydaline, a methylated analog of THP, is present in similar amounts and has the most similar activity, with perhaps even greater analgesic effect.

Corydalis is used extensively by practitioners of Chinese herbal medicine both in Asia and the West, where it is recognized (by those practitioners and their patients) as a safe and often effective remedy for common pain syndromes, especially abdominal pain. It is most frequently utilized in the form of slices of the dried tuber used to make a tea, powdered and combined with other herbs in tablets and cap-sules, or as a powder or granule derived from the hot water extract of the dried tuber. Isolated *l*-tetrahydropalmatine (derived from *Stephania* species) is also widely used in the product Jin Bu Huan (literally: "more valuable than gold," a name given to several folk remedies that are analgesic and hypnotic, including the crude herb *Stephania japonica*). *dl*-Tetrahydropalmatine from corydalis is sold in tablets in the product called *Yuan Hu Zhi Tong Pian*.

Virtually all over-the-counter herb remedies for hay fever and sinus congestion contain the original source material or a related species of Ephedra.

Experiments on rabbits, mice, rats, dogs, and monkeys[8] showed that *dl*-tetrahydropalmatine at high dosage produced a significant hypnotic action. The compound is able to tame monkeys; it markedly decreases both spontaneous and passive activity in mice but is unable to abolish the righting reflex, suggesting the absence of anesthetic action. Subcutaneous injection of the agent to dogs results in sedation, tranquilization, lack of desire to escape, and tame behavior 5-20 minutes after medication; drowsiness is observed 30 minutes later. The effects last as long as 80 minutes. Nevertheless, the animals' senses are still present and they are easily awakened. In relation to these pharmacological findings, it is interesting to note that individuals reporting informally to the Institute for Traditional Medicine (ITM) about their experience with oral ingestion of THP in the form of the Chinese product JBH state that the time from ingestion to onset of effects is about 20 minutes, and that the duration of effects is typically about 90 minutes. (Insomniacs who wish for longer action are disappointed by this, but those who have suffered morning drowsiness from long-acting pharmaceutical drugs like this quality of JBH.)

dl-Tetrahydropalmatine potentiates or antagonizes the action of various drugs that influence the central nervous system.[8] It significantly potentiates the hypnotic action of cyclobarbital and it increases sensitivity to the convulsant effect of strychnine, yet it



Photo ©1994 Jon Jonitz

antagonizes the central stimulant action of caffeine and amphetamine and the convulsant effect of pentylenetetrazole. It also inhibits the neck and back scratching action of mice given the hallucinogen mescaline. In pharmacology experiments, the analgesic action of THP was shown to be less than that of morphine. Its tranquilizing action is stronger than that of morphine but less than that of chlorpromazine. It has been reported that *l*-tetrahydropalmatine has the analgesic and sedative actions, but that *d*-tetrahydropalmatine in similar doses produces a brief stimulation. Experiments with *d*-tetrahydropalmatine have been limited and, thus far, significant differences between the isolated *l*-form and the combined *dl*-form have not been clearly demonstrated.

The mechanism of action of THP has been investigated.[8, 12, 13, 14] It depresses cortical and subcortical electrical activity, especially in the motor areas of the brain. The action on neurotransmitters was shown to be different from that of either reserpine or morphine. While some protoberberine compounds bind to M-cholinergic receptors in the brain, THP and several closely related alkaloids do not. Other studies have shown that *dl*-tetrahydropalmatine and *l*-tetrahydropalmatine deplete the levels of three neurotransmitters: dopamine, norepinephrine, and serotonin, with a corresponding increase in most of their metabolites. This finding suggests that the compound acts as a short-lasting monoamine depleter. The other berberine compounds, some of which could bind to M-cholinergic receptors, do not have an effect on mono-amines in the brain. In other words, the action of THP is unique.

Pharmacokinetic studies[8] show that intragastric administration of THP to mice at a dose of 60 mg/kg results in rapid and nearly complete absorption (90%) within thirty minutes. When injected subcutaneously, the compound mainly enters fatty tissue, and is also found in the lungs, liver, and kidneys. Over time, more of the compound is transferred to fat. It can easily cross the blood-brain barrier, and concentration in the brain peaks within a few minutes, is somewhat reduced after 30 minutes, and quite low after two hours (corresponding, roughly, with the observed impact of the compound on behavior in animals). It should be noted that the common alkaloid berberine also accumulates in brain tissue; in China, pregnant women are not prescribed high doses of berberine because the material can accumulate in fetal brain tissue. THP should therefore not be recommended for use during pregnancy, even though, at this time, there is no reason to believe it will cause harm when used in usual amounts. It appears that most of the alkaloid is metabolized prior to excretion in rabbits, since little is found in urine or feces, but most of it is excreted unmetabolized in the urine of rats within 12 hours. Therefore, the metabolism of the compound differs with the species of animal, though the effects do not differ substantially.

TOXICOLOGY STUDIES

Toxicity of corydalis and THP has been evaluated in China.[8] The LD_{50} (dose lethal to 50% of animals tested) of whole corydalis extract given intragastrically to mice was determined to be equivalent to 100 g/kg, indicating extremely low toxicity (in other studies, comparing different species of corydalis, it was found that the LD_{50} could be lowered to 35 g/kg by selecting the most toxic species; this is low toxicity). The LD_{50} of THP in mice was shown to be 146 mg/kg by intravenous route, the same as that found for several related alkaloids from corydalis. If the figure of about 0.65% alkaloid content of corydalis is assumed, and if the 100 g/kg LD_{50} for the whole material is taken, then the average oral LD_{50} of the alkaloids should be about 650 mg/kg (by the gastric route). The figure of about 150 mg/kg for individual alkaloids by intravenous route appears in agreement, given the usual finding of higher toxicity of intravenous versus gastric routes.

Cats and rabbits receiving intravenous injection of *dl*-tetrahydropalmatine in the dosage range 20 mg/kg to 60 mg/kg show some slight changes in respiration but no toxic effects. A single intragastric dose of 85 or 100 mg/kg or subcutaneous dose of 80 mg/kg given to rats does not result in significant toxicity. Similar doses given to rats over a period of two weeks does not produce signs of toxicity. Extreme sedation and deep hypnosis, however, could be obtained by giving a single intragastric dose of 180 mg/kg to rats.[8]

The dosage of THP actually given to humans for pain relief in clinical practice in China is 60-100 mg per dose by injection, and 60-120 mg per dose orally. The dose can be repeated up to four times per day (total ingestion of nearly 0.5 gram).[8] With such doses, it is reported that neuralgia, dysmenorrhea, simple headaches, headache due to brain concussion, and pain due to internal organ disease (especially gastric ulcer) respond well, but post-surgical pain is not much affected. The treatment does not cause significant tolerance or addiction. The lack of addictive quality has been repeatedly noted in informal reports to ITM.

For insomnia, a dose of 100-200 mg THP at bedtime was reported helpful and no side effects were observed the day after in the Chinese studies.[8] Side effects of normal dosage administration have been reported to include vertigo, fatigue, and nausea. The doses being used in the human studies thus correspond to about 1.3 to 4.2 mg/kg. The patent JBH is made in the form of 80 mg tablets, of which about 29 mg is THP. Since most Americans report that one to four tablets produce adequate response, a single dose of 29-116 mg appears useful. This is substantially lower than the amount used by Chinese patients in clinical studies; according to



Tubers of *Corydalis tuberosa*, by G. Hudson-Maffei, from *Colour Atlas of Chinese Traditional Drugs*, 1987, published by Science Press, Beijing, China.

those studies, and given the body weight differences usually involved, doses of up to eight tablets at one time would be reasonable for adults wanting bedtime sedation.

Based on the available laboratory and clinical reports from China,[8] the dosage ratio between a potentially fatal amount (about 150 mg/kg by injection and probably in excess of 200 mg/kg orally or intragastrically in small animals) and a clinically effective amount (in humans) is 50:1 or better. A fifty-fold difference between therapeutic and poisonous levels is more characteristic of foods than modern drugs. (For example, even coffee is more toxic—because of its caffeine content—than corydalis or THP). However, an infant or young child who swallowed pills of JBH could obtain an intermediate dose that would be potentially dangerous, as has been shown by experience. The product is currently packed in individual vials of 12 tablets; a 25-pound child consuming all 12 tablets could get more than 20 times the normal "therapeutic" level. The vials are not child-proof. ITM has received several informal reports of adults consuming 12 to 24 tablets of JBH through misunderstanding of the instructions for use. It appears that the adult response to overdose is mental agitation rather than the deep sleep that occurs with young children. In addition, some adults experience a paradoxical response to small or moderate doses, with mental agitation or even hallucinations being reported. The effects are always short-term, lasting a few hours at most, whether the dosage is low or high.

Corydalis is used extensively by practitioners of Chinese herbal medicine both in Asia and the West, where it is recognized (by those practitioners and their patients) as a safe and often effective remedy for common pain syndromes, especially abdominal pain.

VARIABILITY

The content of alkaloids in *Corydalis* and *Stephania*, as in other herbs, is found to vary with the particular species collected as well as with the growing location and other factors, such as soil content, sun exposure, and rain, all of which influence the plant metabolism. At least eight species of *Corydalis* are used as sources of the market material within China (additional species are also used in Korea and Japan); it is likely that only one or possibly two species enter the U.S. (This is because the U.S. market affords the "best" quality of an herb and therefore the material from the species with the best reputation is selected by most of the importers.) Variability of JBH tablets has been suggested informally in reports to ITM: some people claim that individual boxes of JBH are "good" or are "ineffective." It is possible that there is variability in the manufacturing process or that storage conditions may make the finished product less potent (perhaps from excessive heat or longer duration of storage). There might also be some variability in response among patients depending upon the fat levels in the body, if, in fact, the distribution to fat tissues influences the amount of the compound that reaches the brain or the duration of adequate dosage in the brain. The variability in response attributed to the JBH product might actually be due to different circumstances of use.

OTHER APPLICATIONS

In China, further applications of corydalis and THP are being investigated.[8, 15, 16, 17] Studies conducted thus far demonstrate a mild hypotensive action, an ability to counter arrhythmia induced by ouabain and picrotoxin, an inhibition of mycobacteria, and the ability to prevent and treat silicosis. The antiarrhythmic effect is the one of greatest interest, since it is consistent and substantial. The perceived value of THP is so high that tissue culture of the *Stephania* species is being investigated as a means of enhancing total production. Corydalis compounded with calcium salts from natural sources (such as sea shells) has been used clinically in the Orient and the West to treat gastric ulcer; in addition to relieving pain, it appears to have a curative effect. A prepared formula of this nature (Gastropathy Capsules) is sometimes imported from China. In the U.S. corydalis is being used experimentally by acupuncturists in complex herb formulas for the treatment of endometriosis.

In China, corydalis is usually used in the amount of 3 to 12 grams per day in the form of decoction, and about 0.9 to 2 grams per day as a powder. Based on the alkaloid content of the herb, the total alkaloids consumed by either of these methods (assuming 100% extraction by decoction) would be from 6 to 72 mg per day; lower than that used clinically (in China) for pain or for inducing sleep in a single dose. This lower level is useful, nonetheless, because other herbs consumed at the same time can help produce certain desired effects (including pain relief through other mechanisms), and it has been suggested that the total alkaloids have superior pain-relieving action compared to a single alkaloid from the plant. Drowsiness is not reported by individuals using corydalis by this method.

LIVER HYPERSENSITIVITY

The Rocky Mountain Drug and Poison Control Center has developed a database on adverse reactions to JBH, including about 10 cases (as of April 1994) of possible liver hypersensitivity.[8] Persons who are sensitive to THP develop severe liver inflammation even with modest dosage if the alkaloid is consumed repeatedly over a period of time. The inflammation subsides over a period of several weeks after ingestion of THP is stopped. Some American practitioners of Chinese medicine have observed individual cases of raised liver enzymes—the characteristic sign of liver inflammation—in patients who were using JBH regularly for several months and have reported such incidents to ITM during 1993. It has not been established that JBH was the cause in each case, since the individuals consuming JBH on a regular basis may have been using it in response to undiagnosed liver problems that lead to pain and/or insomnia. However, it was recently reported by Dr. Graham Woolf

Continued on page 72

Amazing Amazon

MDs Take Ethnobotanical Tour of Rainforest

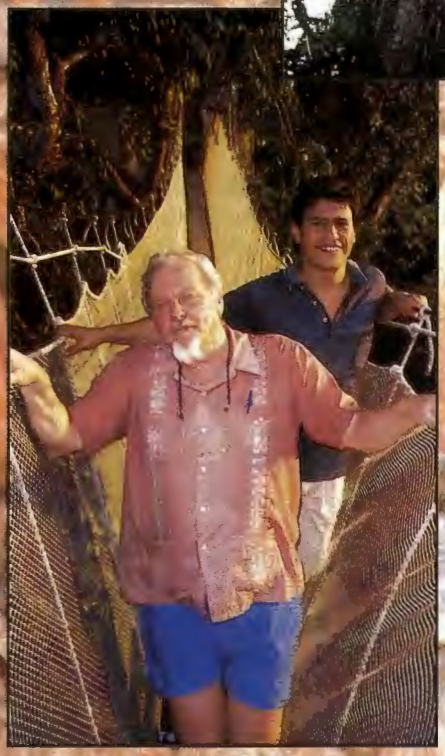
Text and photos by Mark Blumenthal



The escort for our Amazon tour group, composed mainly of physicians and other health professionals, was noted USDA ethnobotanist Dr. James A. Duke. He would be our guide as we lived in the rainforest near Iquitos, in eastern Peru last January.

After a four-hour ride down the Amazon in a small, thatch-covered boat, we arrived at the Explorarama Lodge, our lodging for the first two nights. Explorarama, located near the bank of the river, was established almost 30 years ago by Peter Jenson, an American who had been working in Peru during the 60s for the Peace Corps. Our accommodations were a bit primitive, but pleasant.

The area of the Amazon surrounding Explorarama is located in an area which biologists consider the most biologically diverse on Earth. One survey has counted at least 300 different species of trees in one hectare (2.5 acres) alone! By comparison, a hectare of temperate forest in northern latitudes will usually contain approximately 20 tree species. Add the shrubs, vines and lianas, herbaceous plants (plants without a woody stem), and fungi and you have what is clearly a bonanza of botanical bio-mass. If you then count insects and other higher animals, the numbers of species differentiation can reach into the millions! A visiting entomologist was able to document 1,500 species of insects in one tree—1,200 unknown to science!



Dr. James A. Duke and Rodolfo Vasquez

Dr. Duke constantly reminded us that many modern drugs currently used by some of the physicians in our group had their origin in these or similar rainforests. For example, the antimalarial quinine is derived from the Cinchona bark (*Cinchona spp.*); physostigmine, a cholinergic drug used in medicine is found in the ordeal bean (*Physostigmus venenosum*), and pilocarpine, a drug used to treat glaucoma and as parasympathomimetic and stimulator of saliva and tear ducts, is extracted from Jaborandi leaves (*Pilocarpus spp.*). The famous vinca alkaloids vinblastine and vincristine, used for childhood leukemia and Hodgkin's disease, are derived from the Madagascar periwinkle (*Catharanthus roseus*).

Another prime example is d-tubocurarine, a pre-surgical muscle relaxant that is derived from plants used by Amazonian Indians for arrow poisons. The poison, known generally by the name *curare*, is made from the leaves of several rainforest plants.

A high point of our stay at Explorarama was a demonstration by a Yagua Indian of the use of poison darts shot through blow guns. Some of us tried to shoot these darts through a blow gun that was at least five feet long. (I shot my dart, but missed the target. Maybe I'll have better luck when I return in October!)

Only about 5,000 plants have been studied by modern science for their medicinal potential worldwide. According to Professor Norman R. Farnsworth of the University of Illinois at Chicago, a world expert in medicinal plants, "There are 121 prescription drugs in use today in many different countries in the world that come from only 90 species of plants. Of these 121, 74 %

Medicines

came from following up native folklore claims. There are 250,000 species of plants on the planet." A logical person would have to say "there are a lot more jackpots out there."

The third day we boated further up the Amazon and the Napo River, a major tributary. After a half-hour overland walk the next day we arrived at the Amazon Center for Environment and Educational Research (ACEER), a non-profit organization responsible for the administration of the Amazon Biosphere Reserve. This first-of-its-kind center is located on 250,000 acres of primary rainforest deep within the upper Amazon and Rio Napo. Aside from the abundance of biology at ACEER, the primary feature is the Rainforest Canopy walkway, a series of walkways that, when completed, will be over 1,200 feet long.

The canopy walkway was built over a two-year period by Paul Donahue, Teresa Wood, and a small staff of native workmen. The trees that support the suspended walkway were selected by botanists from the Missouri Botanical Garden, especially by Dr. Alywn Gentry. He and other botanists climbed the tall trees with ropes and pulleys using a technique that does not scar the bark.

The forest area around the canopy has an 80-year turnover rate, the fastest rate of any rainforest in the world. That is, biologists estimate that the average tree in this area will live a maximum of only about 80 years before it will fall and eventually be replaced by new growth. The thirteen largest trees chosen to support the canopy walkway are guy-wired to the ground to help maintain their stability, as these trees, like all rainforest trees, have very shallow root systems, and are thus at risk without the additional support.

Looking down from the twelve-story-high canopy walkway gave us a clear view of the forest for many miles. In the forest the dense growth of the upper part of the trees and vines (canopy) blocks out much of the sunlight—but up here it was as if you were in a different world from the lush, dense darkness of the understory below.

This trip created the opportunity for lively repartee among botanists, herbalists, holistic and "half-holistic" ("halfistic" in Duke's jocular jargon) physicians and nurses regarding the role of plants in medicine, the real meaning of health, and other related topics. Our evening campfires became a microcosm of what could be or *should be* the conversation among health professionals on a grander scale back in the "civilized" world.

Regarding this incredible area of the rainforest, Jim Duke told me, "About 80% of new visitors get so turned on that they become 'missionaries' for ACEER ecotours." This group was no exception. Many [like me] were already making plans to come back, bringing friends and/or family or business associates. While botanists, biologists, and conservationists are racing against time to preserve what's left of the rapidly receding rainforests, health professionals can support and assist these efforts by becoming more familiar with the biology, botany, ethnobotany, and culture of this vital area of our planet. By realizing that the rainforest flora offer myriads of possibilities for new medicines, physicians, pharmacists, and others interested in natural healthcare and the environment have an opportunity to become an essential part of the solution to the ecological crisis we all face as citizens of planet Earth. ❑



If You Want to Go

The American Botanical Council and the Texas Pharmacy Foundation are co-sponsoring a week-long ethnobotanical tour of the Peruvian Amazon rainforest in October 1994.

Workshop leaders include Dr. James A. Duke, author and ethnobotanist at USDA; Dr. Varro E. Tyler, author and Lilly Distinguished Professor of Pharmacognosy at Purdue University; Professors Walter Lewis and Memory Elvin-Lewis of Washington University; Dr. Mark Plotkin, author and ethnobotanist at Conservation International; Tom Carlson, M.D., vice-president of ethnobiomedicine at Shaman Pharmaceuticals; and Mark Blumenthal of ABC and HerbalGram. Registered pharmacists can earn continuing education credits for participation.

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MEXICAN-AMERICAN HERBAL REMEDIES: AN EVALUATION

by Joe S. Graham, Associate Professor of Anthropology
Department of Psychology and Sociology, Texas A&M University—Kingsville

Folk medicine is the most extensively studied component of Mexican-American traditional culture in South Texas. Research in the area has focused primarily on five or six folk illness syndromes and on the non-herbal treatments of *curanderos*, the healers *par excellence* in Mexican and Mexican-American traditional culture (Dodson 1951, Rubel 1966, Madsen 1964, Kiev 1968, Trotter and Chavira 1981, Romano 1965, Graham 1985, and others). While scholars have given great attention to the ritual treatments for such folk illness syndromes as *mal de ojo*, *empacho*, *mollera caída*, *susto*, *mal puesto*, and *latido*, they have failed to carefully document and explore as carefully the herbal remedies often used in conjunction with ritual treatments. And although Trotter (1981b) and Kimber (1974) have shown that folk herbal remedies play a major role in the Mexican-American folk medical system in the Lower Rio Grande Valley, there has been no comprehensive study of these remedies which meets the standards recommended by Croom (1983) and others. The best and most comprehensive works published on herbal remedies in South Texas are those by Trotter (1981a, 1981b), which are based to a large extent on information collected by students as class assignments (1981a). Popular studies like those by Rodríguez and Rodríguez (1977) and Torres (1983, 1984) are basically lists of herbs and their uses. There are no herbarium collections focused specifically on medicinal plants of this region, a fact which makes careful biomedical evaluations of these herbal remedies impossible. As a consequence, scholars and folk practitioners may sometimes have difficulty knowing which of the many herbal remedies are biomedically efficacious, which are not, and which ones may pose serious health hazards to those who use them.

While Trotter (1983a and 1985) has demonstrated that folk remedies used in South Texas may be poisonous, this area of research for South Texas is practically non-existent. Huxtable (1980) has demonstrated that Mexican Americans use various plants as *gordolobo yerba*, usually taken in the form of a tea. One species, *Senecio longilobus*, can cause extensive liver damage. He recorded two instances of parents administering the plant to infants as a cough remedy, resulting in severe liver damage in both and the eventual death of one. Given the fact that Mexican Americans in South Texas rely extensively on herbal remedies in their health care practices, the possible toxicity of these plants should be investigated and that information passed on to both the practitioners in the region and the patients who use them. Hence this project.

NIH-FUNDED PROJECT TO BEGIN FILLING THE GAPS

Because so few plant remedies have undergone the standard testing required for prescription drugs (the average cost to get a drug approved by the FDA is between $231 million to $359 million), it is necessary in serious investigations of herbal remedies to apply more rigorous scientific testing procedures as appropriate for these substances. Hopefully, one day these herbal remedies will be subjected to chemical analysis, laboratory experiments, epidemiological studies, and clinical trials. These are clearly long-range goals which, because of their complexity, will require a collaborative effort by those trained in many aspects of biomedicine (e.g., ethnobotanists, pharmacognosists, physicians, and chemists). This current project, funded by a grant from the National Institutes of Health, is designed to accomplish the first critical steps in evaluating the herbal remedies used by Mexican Americans in South Texas: identifying the plants and their uses and carefully documenting the pertinent information as outlined by Croom (1983), Ortiz de Montellano and Browner (1985), and Trotter (1983, 1985).

This project is designed to accomplish the following: (1) ascertain to what extent Mexican-Americans rely on herbal remedies in their health care; (2) develop a comprehensive listing of the medicinal herbs used in South Texas, including their Latin and common names and what they are used for; building on the works of Trotter, Chavira, Kimber and others whose work focused specifically on the Lower Rio Grande Valley, participants involved in the project will seek to verify the findings of these earlier studies and compare the remedies used along the Rio Grande to those used in other areas of South Texas and beyond; (3) collect voucher specimens of the various plants and have them scientifically identified and placed into the herbarium at Texas A&M University—Kingsville, which already has over 10,000 specimens in it; (4) using appropriate databases, specifically NAPRALERT, attempt to ascertain which herbs are biomedically efficacious and which are toxic; (5) compare the findings in South Texas with those of other Hispanic groups ((e.g., Baja California (Winkleman 1980), New Mexico (Appelt 1985; Bye and Linares 1986), and Mexico (Perez *et al.* 1984; Ortiz de Montellano and Browner 1985)); and (6) disseminate this information both to those who used these herbal remedies and to the academic community.

Each of these steps is being done (or will be done) in such a manner that those who use the information in the future can be assured of its accuracy and thoroughness, following the methodology described in detail below.

The research methodology proposed in our ongoing project, to be discussed in greater detail below, may be summarized as follows: (1) carefully review the literature about folk healing in the South Texas region to begin identifying the herbs used in the folk medical system and the remedies used by the various folk practitioners; (2) based on field research, including questionnaires and interviews providing a random, representative sample of those in the

culture, determine the extent to which Mexican Americans in South Texas rely on herbal remedies; (3) identify and locate the best (i.e., most popular) folk healers in the region; (4) interview them in depth to discover the emic (native) view of health and illness categories and the prescribed ritual and/or herbal treatments for the various illnesses; (5) carefully document each herbal remedy, including what herb is used, what its effects are believed to be, why it is believed to produce such results, what part of the plant is used, when (time of day, month, and year) it is gathered, how it is prepared, what the appropriate dosage is, when and how often it should be taken; (6) collect voucher samples of the herbs for classification, for preservation, for museum and other exhibits, and for possible future analysis—insuring that some of the specimens conform to (5) above; (7) scientifically identify/classify the herbs into botanical classifications; (8) carefully review the literature (specifically that contained in the NAPRALERT database) to discover if these plants have been analyzed by others to identify the possible pharmacological properties of the plants and to identify the active chemicals; (9) for those plants which have been analyzed, determine (using NAPRALERT) if the properties which they have could produce the results claimed by the folk practitioners; (10) determine, if possible, what plants are toxic at what levels of use; and finally (11) to communicate the findings of the study to the academic community and especially to those who use the remedies.

Most of the steps outlined above are self-explanatory. At the heart of the project lies the careful documentation of each herbal remedy, including the following: a) the folk and Latin name of the plant, b) what it is used for, c) what part of the plant is used, d) when and how it is to be collected, stored, and prepared, e) what illnesses it is used for, f) what the symptoms of those illnesses are, g) what the herbal medicine's effects are believed to be, h) why the remedy is thought to produce such effects, and i) information about the beliefs about human physiology which form the basis for these beliefs. This information is crucial to the scientific evaluation of the remedies, noted below.

...NINETY PER CENT OF THE MEXICAN-AMERICANS IN THE COMMUNITIES WE HAVE SURVEYED RELY UPON MEDICINAL HERBS FOR MAJOR AS WELL AS MINOR ILLNESSES.

We are collecting voucher specimens of the medicinal plants which we have thus documented, having them classified by a botanist, and then reviewing the scientific literature to discover if these plants have been chemically analyzed. Most searching will be done in the NAPRALERT database, though other resources will be consulted. The chemistry for each plant investigated will be carefully recorded, cataloged, and entered into the computer. Those which have not been chemically analyzed will be noted for possible future research.

For the plants which have been chemically analyzed, we will examine the appropriate sources in pharmacological literature to ascertain if the crude plant, related species, or isolated chemical compounds the plant is known to contain could produce the physiological effects claimed by the folk practitioners. In other words, the known biomedicinal effects of the chemicals in the plants will be compared to those effects claimed by the folk practitioner. We will attempt to discover what disagreements occur and what the nature of these disagreements are. This procedure, although not the exclusive basis for evaluating herbal medicines, will help us to discover the extent to which the effects of folk herbal medicines conform with what is known in biomedical science and perhaps to what extent other principles (e.g., the placebo effect) may be operating. Thus the validity, possible validity, or invalidity of the herbal medicine (in biomedical terms) can be determined. Clearly, there will be inadequate information in the scientific literature for many of the plants to be judged valid or invalid. In each case, however, sufficient evidence should be available to indicate one of the levels of confidence suggested by Ortiz de Montellano (1981: 21-22) as analogous to levels of confidence in statistical inference:

"Level 1: Reported folk use is the lowest level of confidence. Reports of parallel usage in populations among whom diffusion is unlikely increase the probability that chemical activity exists (National Academy of Sciences 1975:68); persistent reports over extended historical periods also strengthen folk claims since ineffective herbs are likely to be discarded over time (Lewis and Elvin-Lewis 1977).

"Level 2: Plants at this level satisfy the requirements of Level 1 and, in addition, isolated compounds or extracts have shown the desired activity in either *in vivo* or *in vitro* tests.

"Level 3: These plants satisfy the requirements for Level 2 and there is a plausible biochemical mechanism by which the plant constituents could exert the indicated physiological action.

"Level 4: Plants at this level fulfill the requirements for Level 3 and the compounds in question have been clinically tested or are commonly used in biomedicine." [Browner *et al.*, 1990]

These evaluations will be used to indicate which medicinal herbs might be further investigated. Further, each plant will be examined for toxicity.

STATUS OF THE PROJECT

This project has been underway since 1990. We have completed a thorough survey of the literature and have completed the process of conducting random, representative samples of data from seven communities in South Texas. We have conducted extensive interviews with a number of well-known folk healers who use herbal remedies, including *parteras* (lay midwives), *yerberas* (those who operate herb shops), and some *curanderos*, the healers par excellence in the culture. We have identified approximately 90 herbs used by Mexican Americans in the region, many of which are grown by the people who use them. Some, of course, are available only in yerberías (herb stores). We have collected about 60 voucher specimens and have had them scientifically classified; we have also retrieved the data from the NAPRALERT



database for all of the plants we have identified as being used in the area. We have also entered the information from the 24-page questionnaires used in the surveys into a database at the university, a database which we will use to analyze various aspects of the use of medicinal herbs in this region.

We have discovered that approximately 90 per cent of the Mexican Americans in the communities we have surveyed rely upon medicinal herbs for major as well as minor illnesses. Between 17 per cent and 29 per cent of the women surveyed in the communities have had one or all of their children delivered by *parteras*, and about 10 per cent of those surveyed claim that they continue to use the curanderos in their area.

We have begun relating the information from the NAPRALERT database to the herbs we have collected and classified and have discovered some significant correlations between what the folk healer uses them for and what the NAPRALERT database tells us about them. For example, one herbalist in San Diego recommends a combination of four herbs either boiled or drunk as tea or inhaled in the form of steam as a cure for pneumonia. These include *yerbabuena* (*Mentha spicata*), *ruda* (*Ruta graveolens*), *albacar* (*Ocimum basilicum*) and *altamisa* (*Tanacetum parthenium*). The NAPRALERT database provides the following information about these herbs. Thirteen studies indicate that *yerbabuena* has an anti-viral activity, an anti-bacterial activity, an anti-fungal activity or an analgesic activity, or a combination of these biological effects. Thirty studies indicate that *albacar* has anti-bacterial activity, and 42 studies indicate that it has an anti-fungal activity, along with a list of fourteen other biological effects. Eleven studies indicate that *altamisa* has an antibacterial activity, and other studies report either an anti-fungal activity or an analgesic activity. Thirty-four studies indicate that *ruda* is used in 34 different countries, often for pneumonia or similar maladies. A long list of studies indicate that the herb has, among its 22+ biological effects, an antibacterial activity, antifungal activity, an antiviral activity, and an antiinflammatory activity. Given the known causes of pneumonia, there is clearly a basis for using this combination of herbs as a medicine to treat it.

While there is still much to do in this study, we are making significant progress toward completing many of the goals we have set for ourselves. In addition, four students have completed their M.A. degree in sociology, with their research for the thesis or final graduate research project based on the studies done in this project. One, a 259-page thesis, focused on a folk healer and her status and practice in Hebronville, Texas. ❑

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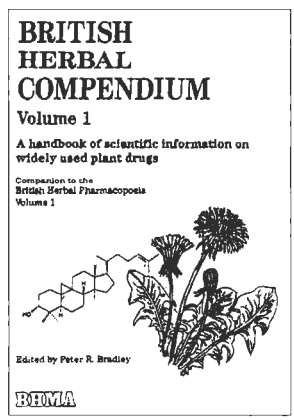
The NAPRALERT database, Department of Medicinal Chemistry and Pharmacognosy, College of Pharmacy, University of Illinois at Chicago. A synthesis of more than 100,000 scientific journals, books, abstracts, and patents from around the world. NAPRALERT, PCRPS (MC/877), College of Pharmacy, University of Illinois at Chicago, 833 South Wood St., Chicago, IL 60612. 312/996-2246. FAX 312/996-3272.

British Herbal Compendium, Volume 1



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TIBETAN MEDICAL PAINTINGS

ILLUSTRATIONS TO THE BLUE BERYL TREATISE OF SANGYE GYAMTSO (1653-1705).

EDITED BY YURI PARFIONOVITCH, GYURME DORJE, AND FERNAND MEYER

Special review by Michael Fallarino, M.A.



Top left - Plate 1: Palace of Buddha Bhaisajyaguru, Master of Remedies. To the south of the city of medicine, Sudarśana, rises Vindhyā ("Piercing") mountain with its pungent, sour, and salty medicinal woods.

Top right - Plate 1: To the north of the city stands the Himavant ("Snow") mountain with its bitter, sweet, and astringent plants.

Left, from Plate 27: Herbal Medications; Rock Mallow, *Bergenia ciliata*, from Yerpa.
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ESSENTIALLY, THERE ARE THREE MAJOR FORMS OF ORIENTAL MEDICINE IN PRACTICE TODAY: CHINESE, INDIAN OR AYURVEDIC, AND TIBETAN. OF THESE, THE TIBETAN SYSTEM IS THE MOST SYNCRETISTIC, YET THE MOST OBSCURE.

Although the indigenous healers of Tibet, the Bon-shamans, were well-versed in the medicinal properties of sub-Himalayan herbs, they lacked a systematized methodology for classifying their knowledge. During the first half of the seventh century, Tibetan King Srongtsan Gampo, a Buddhist convert, convened the country's first international medical conference.

Doctors from China, India, and Persia were invited and the Tibetans extracted the choicest nectar from the represented traditions. Since the Persian medicine of the time incorporated classical Greek medicine, the work of Galen found its way into the newly formulating Tibetan system.

During this period of time, Tibet was entering its golden years, blossoming as an Asiatic cultural power as well as a formidable repository of the Buddhist pantheon. As a result of the sheer quantity of religious activity coupled with a strongly Buddhistic political climate, the formation of systematized medicine in Tibet was as steeped in Buddhist polemics as it was in mundane medical phenomena—and without clear boundaries to differentiate between the two. Thus, a class of lama-physicians was born. This simple fact is at once Tibetan Medicine's greatest strength and the reason why it has remained an obscure and nearly impenetrable study.

The primary text upon which Tibetan Medicine is based is the *Gyu-zhi* or *Four Tantras,* by Chandranandana. Essentially an exposition of Ayurveda, it was translated from the Sanskrit into Tibetan during the eighth century by Vairochana, Tibet's first great translator.

As Tibetan Medical practice evolved, so did its body of literature. Commentaries on the *Four Tantras* appeared. The *Blue Beryl* was the third commentary to appear and it completely eclipsed in clarity, understanding, and comprehensiveness its two predecessors. Its author, Sangye Gyamtso, was the Regent of the Fifth Dalai Lama as well as Tibet's most politically powerful personage. He composed his exposition in 1687 and 1688.

The commentary which is the *Blue Beryl* treatise parallels the form of the *Four Tantras* (formally *Tantra of Secret Instructions on the Eight Branches of the Essence of the Elixir of Immortality*) and is reproduced in this publication exactly. Volume One opens with an editorial preface, and a rather convoluted albeit rigorous and scholarly ten page introduction by Fernand Meyer (of the Centre National de la Recherche Scientifique, Paris). Gyurme Dorje (School of Oriental and African Studies, London) contributed a two-page explanation of the layout of the plates. What follows is a reproduction of each of the 77 *thangkas* or paintings on the right-hand pages, while the facing left-hand pages contain the respective commentary on the plate.

All the plates with the exception of one are in color and the earthy vibrancy of the hues is a pleasure to look at. The set of paintings reproduced here was procured from the Buryat Historical Museum, Ulan-Ude (Buryat Republic, Russian Federation, C.I. S).

Plates One through Four form the Root Tantra in which a brief outline of Tibetan medical principles is set forth. Plates Five through Thirty-seven form the Exegetical Tantra, which explain the theoretical basis of the medicine. Plates Thirty-eight through Fifty-three form the Instructional Tantra, which describes the practical application of the theory. Plates Fifty-Four through Seventy-seven

Continued on page 44



Detail of Plate 32: Compounding of Medications I.
Row 1, left to right: Coleus, *Coleus amboinicus* Lour.; Burrweed, *Xanthium strumarium*; Large-flowered gentian, *Gentiana grandiflora* Laxm.; Horned cumin, *Hypecoum leptocarpum/erectum*; Mamira or goldenthread, *Coptis teetoides chinensis* Franch; Musk, *Moschus moschiferus;* Monkshood, *Aconitum naviculare;* Yellow wolfsbane, *Aconitum lycoctonum*; Red aconite, *Delphinium densiflorum*
Row 2: White gambier, *Uncaria rhynchophylla* Jacq.; Brown gambier, *Uncaria rhynchophylla*; White pokeberry, *Phytolacca esculenta*; Yellow pokeberry, *Phytolacca acinosa* Roxb.; Pleurospermum fungus, *Pleurospermum sp.*; Ragwort, *Cacalia quinquelobus*; Hog's fennel, *Peucedanum praeruptorum* Dunn.; Crazyweed, *Oxytropis chiliophylla/microphylla*; Corallodiscus fern, *Corallodiscus kingianus*



Row 3: Turmeric, *Curcuma longa*; "Lesser" gentian, *Gentiana Urnula*; Male Fern, *Dryopteris fragrans* Schott; Tamarisk, *Myricaria rosea*; White gentian, *Gentiana algida*; Himalayan primula, *Primula capitata*; Wild "male" rose, *Rosa sericea*; Barberry bast, *Berberis asiatica* sp.; Bamboo pith, *Bambusa arundinacea* Gamble.
Row 4: Licorice, *Glycyrrhiza glabra*; Grapevine, *Vitis vinifera*; Sea buckthorn, *Hippophae rhamnoides*; Costus, *Saussurea lappa* dv.; Coleus, *Coleus amboinicus* Lour.; Arenaria, *Arenaria glanduligera*; White sedum/buffalo pen, *Cochlearia scapiflora* Hook/*Thermopsis alpina* (Pall.) Ledeb; "Paw-like" [brown] sedum, *Rhodiola algida*; Moonseed, *Tinospora cordifolia* Miers.
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Plate 25: Plateau and Herbal Medications.
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Plate 26: Herbal Medications.
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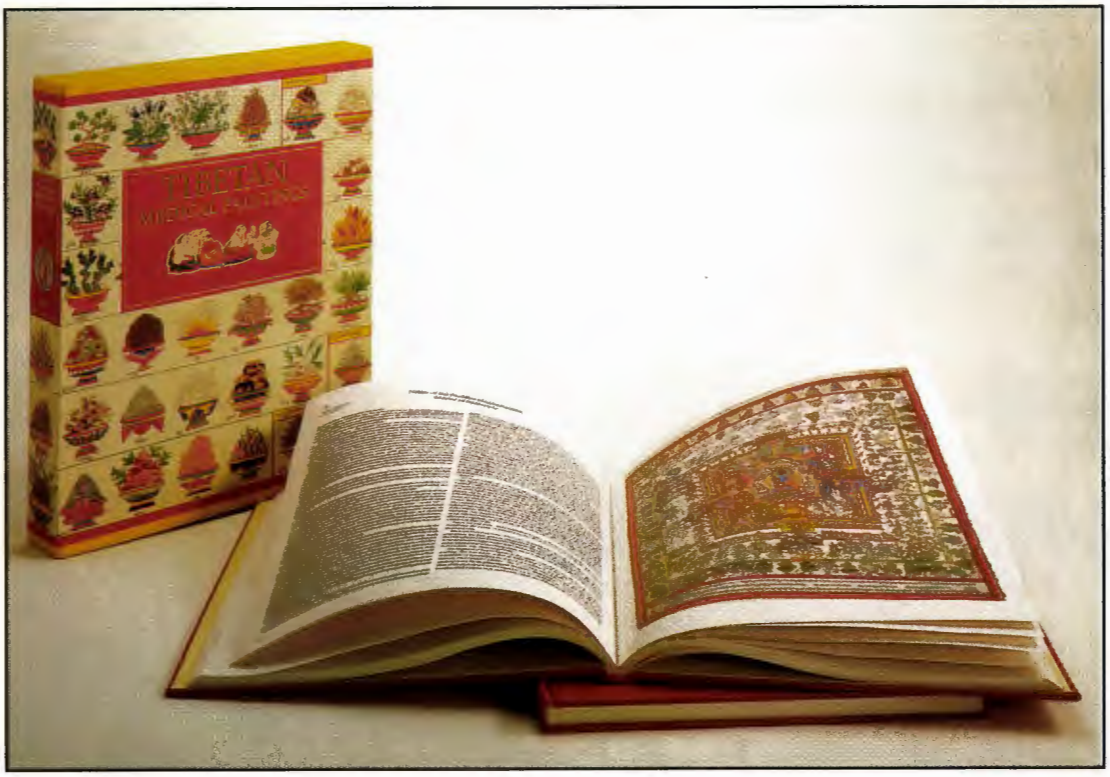

Tibetan Medical Paintings. Illustrations to the *Blue Beryl* treatise of Sangye Gyamtso (1653-1705). 1992.

Two cloth volumes, slipcased. Harry N. Abrams, New York. Volume One, pp. 1-170; Volume Two, pp. 171-336, $195. ISBN 0-8109-3861-8.

Available from ABC Books. Please see page 6 for ordering information.

form the Subsequent Tantra, or applications of practical techniques (pulse, tongue, and urine examination, etc.).

This is a very large format book—the page size alone is twelve inches wide by fourteen inches high. But, given the density of detail architectured into each one of these paintings, a publication of lesser size could not have done justice to their complexity. Since one of the original functions of these paintings was to serve as iconographical mnemonic aids, the serious student of traditional Oriental medicine should still be able to use these aids in the spirit in which they were created.

The Buddhistically postulated origin of Tibetan medicine is essentially ethereal in nature. Its roots are traced to the emanational deity *Bhaisajyaguru*, or the Medicine Buddha. Part of the strength of these Tibetan teachings is that they both emanate from and return to the *void.* In the process of understanding and assimilating this material, the aspirant/practitioner identifies with the Medicine Buddha, thus loosening the fetters of the mundane personality and facilitating the transmission of a purer form of healing energy. Plate One is a depiction of the Medicine Buddha in the emanational abode and from this plate, the timbre of all that follows is set.

The materia medica of the *Blue Beryl* is represented in Plates Twenty-three through Thirty-one. Plate Twenty-three begins with an exposition of taste and potency, and covers territory unique to Tibetan and Ayurvedic medicine—the internal use of specially prepared (*humanized*) gemstones and minerals. A large variety of plant-derived and animal-derived substances are covered in subsequent plates. Some of these substances are described using symptomological classification, and some are described using energetic terms (i.e., "...cold disorders of the stomach and kidneys..."), as is common in medical systems utilizing differential diagnosis. Using some of the substances listed in the Supplementary Materia Medica would prove a true challenge to the contemporary practicing herbalist, as well as being difficult to track on any kind of empirical basis. For example: "Old leather soles from a shoe and the burnt hair from the nape of the neck alleviate poisons derived from body hair,...the underpants of a widow guard against epilepsy and stroke due to malign planetary influences..." (Plate 30).

Volume two of *Tibetan Medical Paintings* consists of a republication of all seventy-seven plates, but in black and white, with each of the icons numbered in red ink. The facing page annotates the numbers, which typically range between one hundred and two hundred in quantity. The underpants of a widow are represented clearly in both volumes.

Since the Chinese occupation of Tibet began in the 1950s, Tibetans and their teachings have spread like sparks from a flame to lands and minds willing to give them refuge. No other tradition has plunged so fearlessly into the interstice between psyche and soma to grapple with the demons which obscure the unfoldment and maintenance of health. What we learn foremost from these teachings is how to be in possession of our own mind. The publication of these volumes is not just important scholarship, it's a significant cultural event. ❑

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Profile of a Traditional Healer:

OKU AMPOFO

IN AUGUST 1993, HERBERT GIRARDET AND DIANE ROBERTSON-WINN INTERVIEWED DR. OKU AMPOFO IN AKWAPIM MAMPONG, GHANA. HERBALGRAM PRESENTS DR. AMPOFO'S VIEWS ON TRADITIONAL AFRICAN MEDICINE.

by Herbert Girardet and Diane Robertson-Winn

Photographs ©1994 Diane Robertson-Winn

Oku Ampofo, M.D., Edinburgh, Scotland-trained physician and Ghana's leading sculptor, is now 85 and no longer able to walk due to a deteriorating spinal condition. He continues to be a fount of knowledge and is the type of human "library" that, in many ways, cannot be replicated. HealthSearch (a company founded by Robertson-Winn) has been interviewing him to record his knowledge and suggestions. Herbert Girardet is an award-winning documentary filmmaker from London ("Jungle Pharmacy") who is currently working on a new documentary film on Dr. Ampofo's life and the work of the Centre for Scientific Research into Plant Medicine.

I have traveled a bit round the world and it is surprising how, almost everywhere—in South America, India, China, and Japan—there is a resurgence of knowledge which people have inherited from their ancestors about different medicines. In Ghana, as in other parts of Africa, the same thing is happening. Before the white man came, we used our plants, our minerals, and animal parts for healing and for curing disease. Today about eighty percent of health delivery in West Africa still depends on traditional knowledge that we have acquired from our ancestors. There is a slowly dying tendency in the world that African traditional medicine is bogus—some sort of hocus-pocus. You see this in films and photographs.

Our experience in Ghana through the Centre for Scientific Research into Plant Medicine is quite different. This experience of our ancestors, over thousands of years, has been found to be true and effective and, in point of fact, most of our work at the Centre seems to be confirming what the traditional healer has been saying.



We have a lot to learn from the traditional healer about his claims. These claims are based on human experience of long-standing experimentation and intuition and also what you might call inspiration. One healer might have something like one or two hundred different plants for various uses. If you interview him, he will tell you not only about these traditional plants, but what parts to use. In some cases it may be the leaf, in others maybe the tree bark, in others root bark, or maybe the seeds or flowers. This knowledge has come out of years of experimentation and usefulness in treating diseases.

We find that in our attempts to get to the root of this knowledge, we use laboratory methods to confirm the herbalist's claim and to determine what are the essential properties from the plant. The modern system is to get tree bark, boil it, blend it with chemicals of different kinds. We don't need to boil everything or to use various chemicals for these extractions. The herbalist does not always boil his medicinal stock. He may boil it, or he may just dry it and then use it, or he may simply soak it in cold water and put it in the sun, then use it. So, in our modern research system, we have to learn exactly what the traditional herbalist says and use his method in extracting the essential properties. I think this is very important. This is where we often miss the boat and come to the conclusion that there is nothing in the original claim after all and this may be because we have simply missed the correct method of preparation.

Each part of the tree absorbs the nutrients from the soil—minerals and liquid material—and passes them on through the stem bark to the leaves, fruits, and flowers, therefore, root bark may have different properties than the tree bark or the leaves. We believe that the roots extract the most potent chemicals from the soil, mainly minerals, and as these are passed on through the tree bark they get less and less concentrated as they reach the leaves where a chemical change occurs through insolation (the photo effect from the sun). In the leaves, of course, photosynthesis takes place and this photosynthesis goes a long way in creating a difference between the chemicals derived from the leaves compared with those in the tree bark or the root bark.

Bark-derived medicines are considered as the most potent, but this is not the rule in all cases. There are instances where the essential pharmaceutical property is stored in the leaf system, in the flower, or the pod. We have found specific instances where the essential curative property is only in the seed and not in the bark, the stem, or even in the root.

The herbalist knows which plant to use according to his experience of the properties of the different plant parts. This is an inherited knowledge as well as the result of his own experimentation. In some diseases he will use just leaves because he knows that a particular tree or shrub has most of its essential properties stored in the leaves, or in the pod, the flower, or in the stem or root bark. When the herbalist says that he is just going to use the root, he has a reason for saying so. If you analyze all the parts of the plant, but leave out the root, you cannot get the essential property of the plant which is used for healing. You have to stick to what he says which is what he has learned through his experience.



Top, Dr. Oku Ampofo at 80. *Middle, Cryptolepis sanguinolenta*, a medicinal plant under cultivation at the Centre's farm. *Bottom*, Patient and child waiting at the Centre.



The belief in Ghana and in other parts of Africa is that wherever there is a dense tropical forest, there is undergrowth which often has medicinal properties. But there is a difference in the medicinal properties in the forest undergrowth and that of plants which grow in grassland or in the desert. Many healers actually believe that the plants which get direct insolation are more potent than those which are in the undergrowth of forest area. So they use mainly grassland plants for certain diseases.

There are different types of traditional medicine in different ecosystems in Africa and West Africa—healers who work in the rain forest areas have different pharmacopoeia than those who work in the dry land areas. There is an overlap because what you get is a healer who will go all over the country to look for healing material and there are some plants which grow both in the forest area and also in the savannah and grassland area. So the healer has to learn all these different plants and also those which are identical, and find out their effect in the treatment of diseases.

That is how healers came to their conclusions that plant materials in the savannah and grassland area are often more potent than those in the tropical rain forest. Most herbalists spend a lot of time in particular areas sorting out the identical plants and also the different plants from the forest ones.

In the past what you found was that people in the regions of Africa above the rain forest belt used their experience of the potency of their savannah plants in selling these to the people in the forest areas. I remember as a child always seeing the northerners coming down with their bags on their shoulders, selling what they considered to be more potent herbs to the villagers further south.

It has always surprised me how traditional healers could tell whether a particular plant has healing properties or not. How they come to acquire that knowledge is something I always ask myself. Among the thousands and thousands of plants, how could a man select a particular plant that is useful for, say, malaria or pneumonia or for a cough? That side of it is difficult to explain.

I think that people who live close to nature always have some sort of direct intuition with nature and perhaps it began as such; people would have a sense that a particular plant might be useful. You know the story among your own people, the Europeans, that the plant "digitalis" or "foxglove" was discovered by an old country woman who had heart disease. She was receiving treatment from a doctor without any success. One day she took a walk in the country and discovered this plant which looked like a heart. So she said, "Well, let me try this plant which looks like a heart." When she did, her illness disappeared and so she introduced it to her doctor who started using it. It has become a standard joke among doctors how digitalis began being used for treating heart disease in this way.



It isn't a joke, but a start of serious experimenting with plants. People would have gone around the countryside observing certain plants which, say, looked like a kidney and they got the idea these could be used for kidney complaints; that kind of thing. There also must have been some years of experimentation on human beings and also some observation on animal behaviour. We have a story that a hunter once saw two snakes fighting. One snake bit and poisoned the other mortally and, as the dying snake struggled, the victor fetched a plant and put it in its victim's mouth, bringing life back. This is how people found plants with healing properties. So people are observant by nature. What trees and seeds animals eat must be used for humans as well. In fact, some trees are named after animal behavior. There is the horn beetle tree which is named after it. So there is observation on animal behavior apart from medical experimentation on humans.

THE HERBALIST KNOWS WHICH PLANT TO USE ACCORDING TO HIS EXPERIENCE OF THE PROPERTIES OF THE DIFFERENT PLANT PARTS.

Before one becomes a healer, one undergoes a long period of tutelage under an experienced healer. This may take anywhere from seven to ten years. Even before one is admitted into the system of healing, an herbalist will select his students very carefully. It might be his son who is interested in the art of healing, but not every son. One who is observed to have a real interest in healing will be selected and trained. You are trained for seven to ten years or even more before you are let loose on the public because, of course, plants look very similar and you must have full knowledge of the type of plant you pluck. So there is a person, a healer, who embodies centuries of human knowledge of plants, and this, again, is passed on to his students before they are eventually qualified as healers in their own right.

The medical system at our Centre has a person like me trained both in the Western method and also trying to learn something about the traditional way. I think it is a very good combination. The first thing you have to learn, of course, is a knowledge of the community in which you live. I think it is necessary for every healer or doctor to know about the behavior and beliefs of the community in which he lives because that very often affects the cause of disease of the patient. I mean, we think that a patient from Europe can be examined, questioned, and treated exactly like the patient from say, Africa or India. There is a mistake here. The social background of the patient is very important and his religious belief is also very important. I have learned from my practice the effect of African customs and manners on the mind of the patient I treat, and the cause of disease of the patient before treatment. My experience as a doctor has been enriched by both methods of examination, questioning, and understanding of the human being as a definite entity subject to the influences of mind, body, and spirit, as it were.

The teaching a Western doctor receives can almost be too narrow because it is rather impersonal. There is a tendency for the modern doctor to be rather like a car mechanic, fixing the human body and maybe replacing parts that have gone wrong and maybe unplugging blocked arteries and pipes—that sort of thing. You will find that doctors are increasingly looking for a missing part to be replaced, but very often finding no spare part at all.

Quite a lot of environmental deterioration is occurring and some of this is due to the exploitation of medicinal plants. In the last few years the number of people who have an interest in medicinal plants has increased dramatically. In fact, there is a swing back from the use of Western medicine to traditional medicine and people are going around everywhere gathering medicinal plants. Now this, we have found, is creating changes in the ecology of the country.

For instance, for the last fifty years or so, I have found the countryside from Accra to my home town, Mampong, only thirty miles away, very much changed. It has become more and more of a grassland than even a secondary forest. There is a lot of depletion of trees and people have not been replanting them. Now there is a movement for agro-forestry, for the planting of trees to replace those that have been destroyed, not only for medicinal purposes but also for food and firewood to be used at home.

Forests are removed for a variety of reasons. The more forest we destroy, for the timber industry, for instance, the more we will destroy the medicinal plants that grow in those areas. We can only preserve our medicinal plants if we control the destruction of forest areas. What happened in Ghana has been the destruction of forests for the cocoa (from the cacao tree, *Theobroma cacao*) industry. People felled the giant trees like mahogany, cedar, and oaks when there was no necessity for it, for, after all, cacao is an undergrowth plant.



Harvesting the bark from a segment of a medicinal tree.

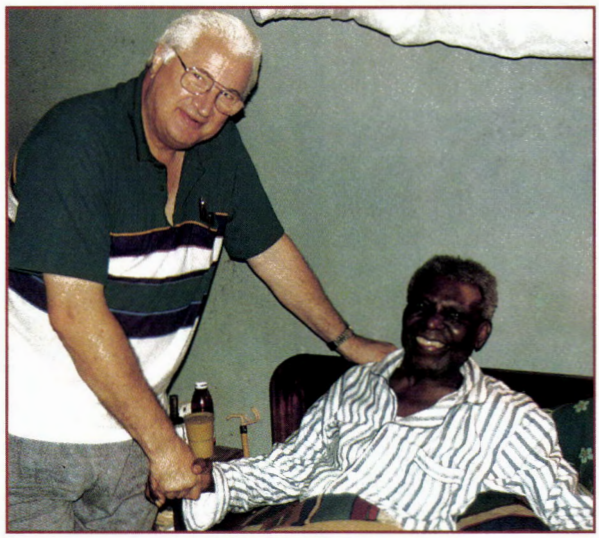
Medicinal plants from forests will disappear if we destroy the forests within which they grow. There is a need for replanting, but in the development of agro-forestry, a careful selection will have to be made for the right kind of trees to be planted in the right place. There is no point in taking a plant from the forest area and hoping that it will grow in the grassland. It must be cultivated in a suitable climate and environment. We have experienced this in trying to create an arboretum. The plants we cultivate must be well adapted to their new environment.

If the exportation of medicinal plants grows up, a new way of conceptualizing our relationship to the environment must also come into the thinking. In other words, reforestation and careful cultivation which is suitable to the particular plant will be critical to make this an environmentally satisfying movement of plant medicine. There is a need to study the types of medicinal plants which

grow in forest areas and those which grow in savannah areas and those which grow in desert-type conditions. When we know more about the conditions under which they grow, we will know where to cultivate them and we will also expand the cultivation so that they don't die out like they are doing at the moment.

As to why we use traditional medicine at all—there is a definite belief based on the experience of the traditional healer. Firstly, there are certain diseases which can only be healed with the traditional methods—a belief that is always questionable to Western-trained people. There is also a very firm belief held by the general public, not only the traditional healer, that there is always a particular tropical plant which heals a certain disease. A saying here in Ghana is, "When God gives you a disease, he gives you a local plant to heal it." So that there are plants around us which are made specifically to heal our diseases, such as when we use a traditional plant in healing which we have found here to be more effective than anything Western that we use. Quite a number of skin diseases can be healed better with plants than with chemicals which are imported into the country.

Professor Norman Farnsworth with Dr. Ampofo, now bedridden at 85.



Plants in themselves contain a number of chemicals in varying degrees. You find that when the average African farmer scrapes the bark off a tree to put on his wound, what he is doing is really to scrape some fungi—a form of antibiotic—for healing his wound. Some tree barks contain fungi which contain antibiotics. During laboratory experiments, it has been found that each plant might contain as many as six or eight different kinds of antibiotics. We once analyzed a plant and we found that it contained seven different antibiotics, some of which are as potent as penicillin. So the contemporary discovery of antibiotics has been the dis-covery of something which already ex-isted in nature and in herbal medicine. We should further investigate and exploit this big store of antibiotics in tree barks and put them to wider use.

I think that the use of herbal medicine has been underrated, for even diseases such as tuberculosis and pneumonia have all been treated in the past. When I was about eleven years old, my father had double pneumonia. The family sent for a healer in the region who was staying about sixty miles away at Amanase. My father sent for this particular healer because he was known to be able to heal pneumonia. (When healers specialize in certain diseases, they become well-known for this skill.)

This man walked sixty miles and I remember well when he arrived—the sun setting behind him; his broad hat; his bag, full of different herbal medicine, hanging on his shoulder. He asked for a bottle of gin, then mixed some of the gin with an herbal powder and gave it to my father to drink. In a short time, my father's breathing difficulty eased and the healer said he could make a cure. I think this was probably his method of testing whether he could heal him or not. Once my father tasted this concoction and his difficulty in breathing subsided, the healer decided that he would stay on—if no subsidence had occurred, he would have left. He stayed in our village for a week until my father had passed over the time of crisis.

The important thing is that a disease like pneumonia was very difficult to heal with the Western method until the discovery of antibiotics in the early 1940s and you will find that there was already a method in the African system for healing pneumonia before this discovery.

There are diseases such as leprosy which have been treated by traditional healers before the development of anti-leprosy drugs. As a child, I saw in a village not very far from ours, a small leprosarium where a healer was treating the disease, particularly early cases, with lepromatus patches. His first method was to apply latex from a leaf on the patch. This latex would destroy the subcutaneous germs and leave an ulcer which eventually healed. In fact, if a person has had leprosy, very often you could tell from his skin that he had been treated by this method.

We find that when there is an accident with a lot of fractures—an automobile accident, for instance—people will always prefer to go to a traditional healer. For one reason, they believe they will heal faster and very often it is difficult to persuade such patients to go to hospitals. In fact, if you admit some of these fracture patients they will request to be discharged to go to a traditional healer. I once fractured my big toe and decided to have traditional healing—my colleagues laughed at me. I called a healer who bandaged the injury with a plant called "Justicia" and included slices of lime bound together. He bandaged my toe for three days. When he took off the bandage the whole toe had become more level.

I did this over a weekend so there was no work load for me. When the healer removed the bandage, my big toe was very, very white. He said that was all right and meant that there was a healing process going on. The toe was hot and we called it "your toe has been boiled." Of course, before he started the treatment, I took an x-ray before I discovered the fracture. After removing the bandage he applied other ground roots of Paulinia and Clausina. He repeated this process again three days later. Within three weeks I was able to wear my shoes and go back to work without feeling any pain. Of course, during the whole treatment there was no pain of any significance.

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Bone-setting, as you people call it, is something which the African herbalist specializes in. In fact, there is a man in town here who takes in quite a number of patients who have asked to be discharged from some of the major hospitals in the country. I took some medical students once based in the Centre hospital to this man. There were smiles and chuckles among the students and patients. It turns out that most of the patients had been to the main hospital for fracture treatment, hadn't done so well there, but were doing very well with this herbalist. So, this is an art worth pursuing.

These healers know anatomy which they apply very, very cleverly. I heard this story at a conference at Ife University in Nigeria. A man had a motorcycle accident and wasn't doing so well at the hospital. He asked to be discharged to a bone-setter. The bone-setter examined the leg and found there was a part of a bone missing so they needed to go to the spot of the accident. They visited the accident site and found the bit of broken tibia left on the spot. The healer took it home, washed it, applied it to the wound, bandaged it, and the man recovered. We always accuse these bone-setters of being ignorant of anatomy but here is a case in which an experienced bone-setter discovered that the bone was not healing because of a missing part.

To heal a large fracture the bone-setter makes a net—a number of plant branches made into a mat, a small mat which forms the splint. This is woven according to the size of the fracture. Herbal medicine is applied, then the mat wrapped around the wound to steady it. One problem the healers face is in intricate cases such as a fracture of the neck of the femur where a large number of arteries, veins, and tendons is involved. The question of alignment becomes a problem here since you need an x-ray to see whether or not there is proper alignment. The bone is healed within about three weeks rather than the six or eight weeks of lying down in pain. If you apply plaster and keep the patient lying down, you will find that the

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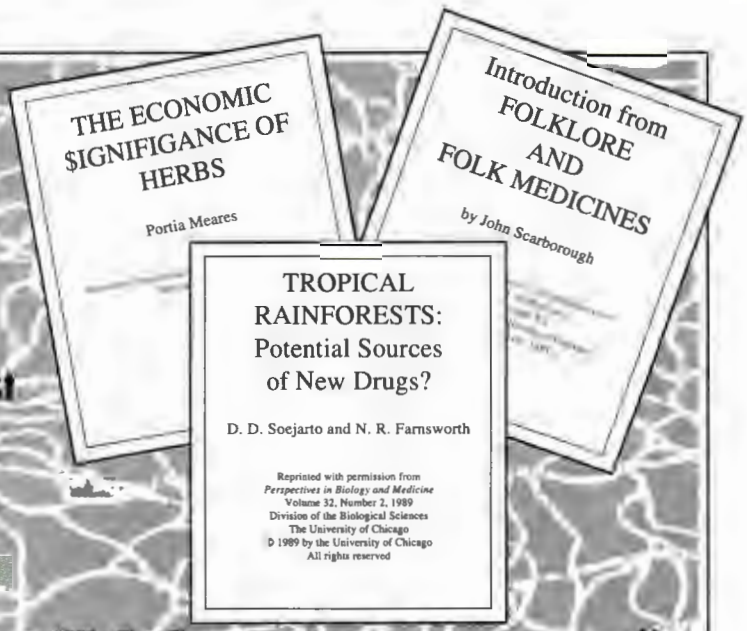

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muscles have a different, or less, power and function.

People often talk about the use of herbal medicine being confined only to small villages or countries of origin. That is disproved, of course, by the fact that, in Western medicine, I would say, in the pharmacology of my day, there was always talk about exotic plants being used in pharmacology, such as quinine, which comes from South America, for malaria. Then you have medicines such as morphine and opium which were discovered in the East, particularly in China at the time. So what people say is not strictly true. Tropical plants are useful all over the world and become a real factor in the change of direction in the treatment of diseases in the next century, particularly because people are finding that the use of chemicals is very often fraught with severe reactions which they cannot find antidotes for. You find that, in herbal medicine, the process of healing is quite different. It is slow rather than a shot straight into your system which develops a very severe reaction. I think that it is going to be one of the new matters in the treatment in medicine which should be looked at very carefully.

The beauty of traditional medicine is that there is a hope of discovering something yet unknown to the Western world. We make the mistake in our laboratories of saying that this specimen, once examined, doesn't contain atropine so it's no use or it doesn't contain strychnine so it's no use because you are looking for strychnine or atropine in a particular plant. What you may get or what you will get in most cases is, let us say, an atropine-like drug or a strychnine-like drug. Yet unknown, there are hundreds of formulae of new drugs which we haven't named. What is coming up all the time is chemical formulae and molecules of different drugs which we have to rename. But I think that the Western chemist doesn't want to bring in all these exotic names just because they don't conform to

Continued on page 58

A Gathering of Flowers

The Florilegium of Jean Andrews

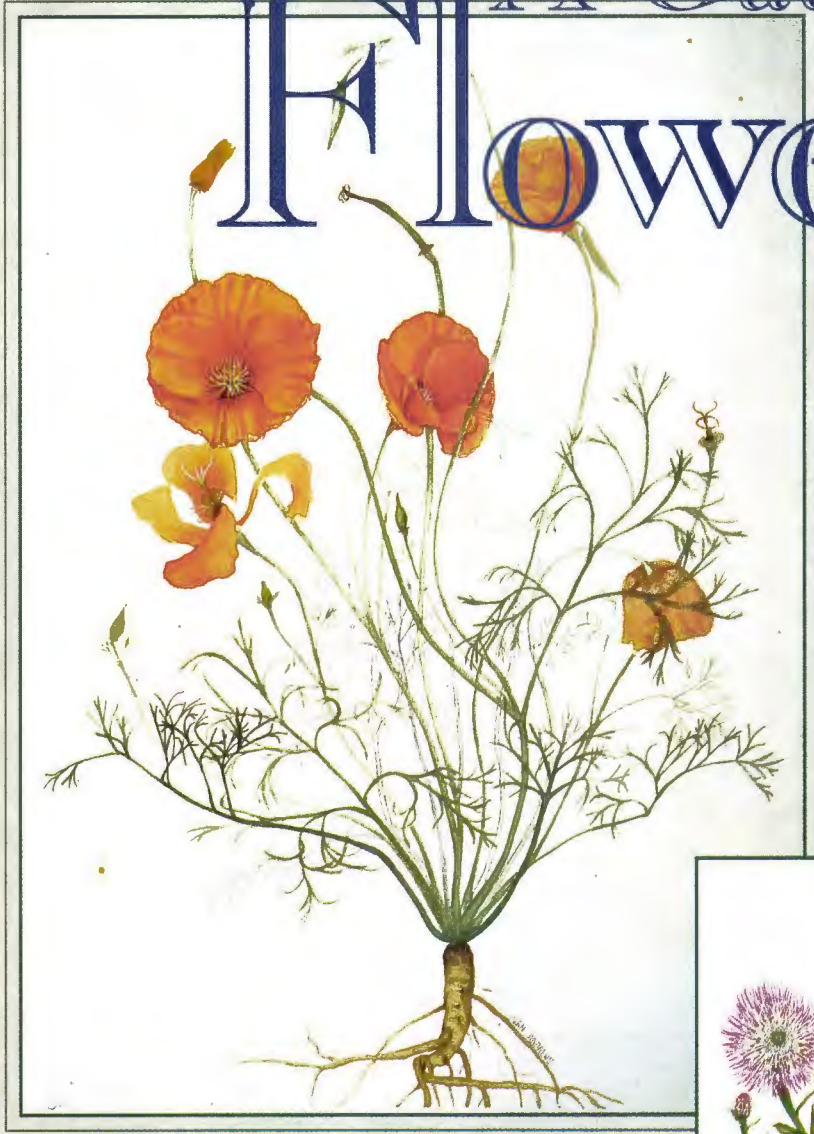
by Ira Kennedy
illustrations by Jean Andrews

Anyone unfamiliar with the remarkable career of Jean Andrews is in for a pleasant surprise. She is one of those people who transcended the limitations of professional credentials, in this case a Ph.D. in Art, to make a lasting impression in another area—botany.

An artist, naturalist, lecturer, gourmet cook, and author, Andrews has been called a Renaissance woman. Her list of accomplishments include writing and illustrating several books, including *Peppers: The Domesticated Capsicums, The Texas Bluebonnet, A Field Guide to Shells of the Texas Coast,* and *American Wildflower Florilegium,* to name a few.

In 1991 she was the first woman to receive a Distinguished Alumni award in the College of Natural Sciences at The University of Texas at Austin. That same year she was named Distinguished Alumni at the University of North Texas.

She is a trustee of the Laguna Gloria Art Museum in Austin, Texas, the National Wildflower Research Center, and the Texas Botanical Garden Society. Andrews is also a member of the Advisory Council of the College of Natural Science, and the Visiting Committees to the Departments of Botany and Human Ecology in The University of Texas at Austin. She has endowed two positions at that university: a visiting professorship in Human Nutrition and a visiting professorship in Tropical and Economic Botany.







Above, **California Poppy**, *Eschscholtzia californica.* Above right, **Basket Flower** *or* **Star Thistle**, *Centaurea americana.* Below, **Jean Andrews**. Photo © 1993 by Ira Kennedy.



Fragrant Water Lily or **Alligator Bonnet**, *Nymphaea odorata*

"The Missouri Evening Primrose, a night bloomer, was my most trying subject..."

Gayfeather or **Blazing Star**,
Liatris punctata



Recognition of Jean Andrews even extends to Costa Rica where the women of the *Cooperativa Artesanias Santa Elena y Monteverde* named their building "Doctora Jean Andrews" in appreciation of her contributions to their community.

The perfect marriage of art and science characterizes all of Andrews's books. In her *American Wildflower Florilegium* Andrews's fifty-two beautifully rendered florals are accompanied with complete descriptions including scientific name, family, life history, origin, range, description, bloom period, pollinators, habitat requirements, propagation, remarks and etymology, species in America, and references.

Her selection of flowers in the *Florilegium* was based on personal preference, availability, and travel time.

Andrews estimates each painting required at least forty hours to finish; however, since her illustrations are developmental composite paintings which show the plant in various stages of growth, each work frequently took over a year to complete.

With her technique Andrews has done what the camera is incapable of achieving in a single picture. In her composites through time Andrews explains, "I show several views of the blossom along with the buds, seed pods, fruits, roots, and at least one leaf in detail in such a manner that the growth pattern of the plant is discernible. In nature, blossom and seed or fruit may not occur at the same time on the same plant." With her paintings a plant can be identified in any stage of growth, greatly aiding identification for the novice botanist.

"The Missouri Evening Primrose, a night bloomer, was my most trying subject," she says. I had luck tricking other flowers with limited opening time to remain open, but none of my subterfuges prevailed with this one. One blistering June I rose before daylight and drove fifty miles a day for a week in order to study the big yellow blossom *in situ*, as it stubbornly refused to remain open if disturbed on its forbidding caliche bank."

Andrews's *American Wildflower Florilegium* derives its name from the Latin words *flos* and *legre*, meaning "flower" and "to gather" respectively. The earliest florilegium was most likely Adrian Collaert's *Florilegium*, published in Holland in 1593. In Jean Andrews we find a person who not only maintains tradition, but one who also brings a wealth of artistic talent and scientific knowledge.

In bringing examples of her *Florilegium* to our readers we at *HerbalGram* have again made a florilegium. The basis for our selection was two-fold: first to select botanicals with medicinal properties, and secondly, to show a few non-medicinal plants solely for their beauty. ❑



Chicory *or* **Blue Sailors**,
Cichorium intybus

Corn Poppy, **Field Poppy**
or **Flanders Poppy**,
Papaver rhoeas Linnaeus 1753





Texas Bluebonnet,
Lupinus texensis



White Prickly Poppy, *Argemone albiflora*



Spiderlily, *Hymenocallis liriosme*



On the book cover, **Purple Coneflower**, *Echinacea purpurea*.

You can own a Florilegium

Andrews' botanical art and accurate informative text combine aesthetics and science to produce a gathering of flowers (a florilegium). The plants are portrayed in a way that reveals those characteristics of importance to a taxonomist as well as appealing to those involved in the arts. Well organized, enjoyable and easy to read. Color reproductions of original artwork, hardcover, 125 pp. From ABC Book Store; see page 2 for ordering information.

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CONFERENCE REPORT

THE FIRST INTERNATIONAL CONFERENCE ON MUSHROOM BIOLOGY AND MUSHROOM PRODUCTS

by J. S. Chilton

On August 23-26, 1993, the First International Conference on Mushroom Biology and Mushroom Products took place in Hong Kong. Organized by UNESCO and the Chinese University of Hong Kong, the conference marked the 30th anniversary of the University, an institution that supports a wide range of mushroom research. The conference chairman, Dr. S. T. Chang, is widely noted in the field of mushroom science for his contributions to mushroom cultivation and his research into medicinal mushroom development and applications.

The program consisted of poster displays and plenary sessions. Topics included cultivation technology of a wide range of edible mushroom species, bioconversion of waste materials by fungi, genetics and breeding, nutritional aspects, and the pharmacology and clinical uses of medicinal mushrooms.

In regard to medicinal uses, a highlight of the program was a presentation by Dr. Goro Chihara,[1] formerly with the National Cancer Research Institute in Japan. In the late sixties and early seventies, Dr. Chihara isolated and characterized lentinan from shiitake (*Lentinus edodes*), a polysaccharide which went through extensive clinical trials and is now an approved drug in Japan for use with chemotherapy in cancer patients. Dr. Chihara believes that cancer research should be focussed on augmentation of intrinsic host defence mechanisms rather than on cell-killing substances. He calls lentinan a "Host Defence Potentiator" and states that it restores homeostasis and potentiates intrinsic resistance against disease. He also feels that these substances may hold the key to protection from aging and believes they may form a bridge between modern immunology and oriental medicine.

Another mushroom, *Coriolus versicolor,* was the topic of many researchers.[2] The protein-bound polysaccharides, PSP[3] and PSK,[4] derived from Coriolus mycelia and mushrooms respectively, are also in clinical use as Host Defence Potentiators. After chemo- or radiotherapy, PSP increases appetite, lessens pain, and improves survival rate of cancer patients. Both of these substances are taken orally and are approved medicines in Japan (PSK), Hong Kong, and China (PSP).

Studies with *Ganoderma,* the reishi mushroom, were presented by researchers worldwide. Dr. Vladimir Kupin,[5] of the Cancer Research Center in Moscow, has been using a reishi extract as a Host Defence Potentiator with patients and has observed positive results. He has also seen a normalization of T-cells in studies with Russian astronauts. Studies[6] by Dr. Geng-Tao Liu of the Chinese Academy of Medical Sciences, using injections of spore and mycelial extracts, detailed the effectiveness of these preparations on skin and collagen disease. He found similar pharmacologic activity in animal and human models. And Dr. Ching-Hua Su,[7] of the Taipei Medical College, reported on his continuing investigations into the hepato-protective activity of Ganoderma triterpenes. Of interest was his finding that crude extracts were more effective free-radical scavengers than isolated refined compounds.



Reishi, *Ganoderma lucidum*
© 1989, Ira Kennedy

Other medicinal mushroom research of note centered around *Tremella fuciformis,*[8] the edible white jelly fungus, *Collybia confluens,*[9] a relative of the tasty Enokitake so common in Japanese cuisine, *Hericium erinaceus*, and *Auricularia auricula.* And although no research was presented on *Cordyceps* species, it is interesting to note that at the recent Chinese National Athletic Games in Beijing, record-setting performances by Chinese athletes made public the use of *Cordyceps* as a performance-enhancing supplement.

The wealth of all this research pointed to the increasing interest in mushrooms as a source of medicinal compounds. In fact, in his opening address to the symposium, Prof. Chang noted that for the first time medicinal mushroom products were valued at over a billion dollars in sales worldwide (mainly lentinan) and that if this growth continued, there may come a point where they overtake the value of mushrooms as food. These were telling words, for as this symposium has demonstrated, the concepts of food and medicine are becoming less parallel and more intertwined. ❑

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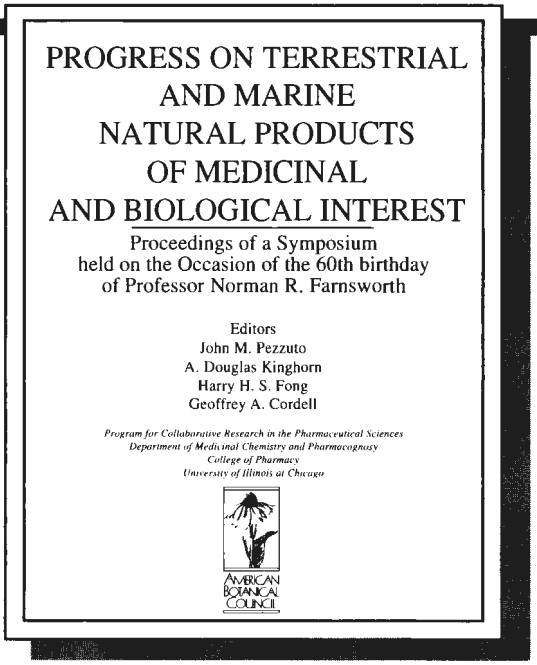

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AMPOFO

Continued from page 51

what they already know. I am hoping that most of these plants contain something yet unknown to the Western world and can cure certain diseases that we can't cure or can cure by slow processes. So that is why it is necessary to pursue this research on and on until we find that we have a breakthrough in the methods of treatment.

The purpose of the research we are doing is twofold. The first is to discover plants whose use is cheaper and more available to the local people. Of course, we are finding quite a lot. We make our own cough mixtures which are, in a way, better than those you find on the market. In fact, some of the staff in the local hospital always come to us for cough mixtures and blood tonics and they find them, according to their own ways, much better than they get from abroad. So, we are trying to find out things which are identical or better than those we import and much cheaper to save foreign exchange, which is very hard to find here. The other reason, of course, is that certainly there must be in all these thousands of herbal plants some particular ones which are unknown to the world.

The first point of our work is to discover drugs which are cheaper and more available to the local people.

The second point is the hope that we may find plant-based drugs, often on the basis of long established knowledge, which are as yet unknown outside the immediate local area. And, in addition, I am convinced that among all those thousands of plants around us there are some with as yet unknown bioactive principles. If we can find useful applications for these we shall have made a significant contribution to the world of medicine.

These are the hopes I have for the future of our work. ❑

National Healthcare Hotline

The Herb Research Foundation announces the creation of the Natural Healthcare Hotline, a major source of natural health care information for the public.

The Hotline will provide information about the health benefits of herbs and dietary supplements. The Hotline begins in May 1994, and will utilize complete files on ten of the most popular herbs, including garlic, ginkgo, ginseng, and bilberry. Over 100 other herbs and dietary supplements will be added to the Hotline database in the next few months. The comprehensive database will make the latest scientific information available to callers. All information included will be reviewed by qualified experts in the fields of health, medicine, and nutrition. The Hotline is to be funded by manufacturers of herbal products and nutritional supplements, major retail stores, and the public.

"To practice self-care and preventive medicine, people need access to information they can trust," says Rob McCaleb, HRF President. "The FDA is placing increasing restrictions on the free flow of information about responsible and appropriate use of natural remedies. We intend to make the facts available to everyone." Demonstrations of the Natural Healthcare Hotline were held at the Natural Products Expo at Anaheim, California, in March 1994.

For more information, contact Rob McCaleb, Natural Healthcare Institute, 1007 Pearl St., #200, Boulder, CO, 80302. Phone 303/449-2682. FAX 303/449-7849.

MARKET REPORT

HERBS AND THE COMMODITIES MARKET

by Peter Landes

Spices: Faithful readers will recall last issue's discussion of a White Pepper/Black Pepper commodity straddle, wherein the trader plays for the differential between two prices of two related commodities that are seemingly out of sync with each other. It matters little whether the overall market for these related commodities rises or falls: the play is only for the price difference between the two. As discussed, the difference in price between White Pepper and Black Pepper has narrowed somewhat, earning a small profit for our hypothetical trader who sold White Pepper short at $1.70/lb. and bought Black Pepper at $0.85/lb. Currently, White can be purchased for about $1.25/lb. and Black can be sold for about $.80/lb., so the $0.85 differential has narrowed to about $0.45, earning a profit of $0.40/lb. on the total position (less commissions, of course).

Really faithful readers will remember our prior recommendation of a position in Nutmeg and Mace, which in classic third-world commodity pricing structure were too cheap for too long. This condition almost inevitably leads (eventually) to a violent price rise as producers stop producing and stocks (often too-large stocks) are slowly but surely depleted. In the case of Nutmeg and Mace collusion between Dutch traders and Indonesian producers seems to have helped the situation along, too. At any rate, the prices of these items currently have almost doubled with no relief in sight. But, fear not, the corollary to the above-mentioned situation is inevitable: eventually prices will be too expensive for too long, leading to overproduction and a corresponding violent price fall.

Other spices remain rather featureless. As mentioned last, Basil and Marjoram have increased in price. Cardamom has fallen from last year's lofty levels and Cloves remain incredibly cheap. Oregano has risen with one large U.S. spice company buying most of the Turkish crop. Cassia seems poised for a move upward and early coverage of requirements for fall demand would probably be prudent. Cumin Seed has leveled off, but market manipulation in this commodity makes the situation uncallable.

Botanicals: Inventories continue at very low levels. Eastern European crops of leaves and herbs were normal but roots remain scarce. Hibiscus is creeping upward after the very low prices of last year and shortages are probably imminent. Chamomile, too, is up, as is Calendula. We are also expecting price rises in Mints from Egypt and Europe this year. Coverage should definitely be extended.

Potpourri Ingredients: This market has matured greatly in the past few seasons. Suppliers are more reliable and have a better idea of qualities required here and cutthroat competition has slackened somewhat, with slight price rises accompanying that slackening. As some items become more-or-less "standard" in this business, they are more reliably obtained from a variety of sources and prices approach "normal" levels, i.e., the cost of production and transportation plus a reasonable profit to keep the producer and shipper interested and performing well. These items should be well-supplied this year. Still, nature can play tricks on agricultural markets; this year's crop of Red Roses, a standard item in potpourri, is very late and very small in spite of best efforts of shippers to supply the market. A sizable price rise is inevitable. ❑

HERB CHECKLIST AND CROSS-REFERENCE

This publication of the American Herbal Products Association includes a checklist of over 550 species of primary plant names of herbs in commerce in the United States with over 1,800 cross-referenced names. A bewildering number of common names, as well as outdated Latin names, are currently used in the commercial herb market. "Herbs of Commerce" is not only a useful key for accurate identification of herbs presently on the market, but a viable industry standard which will help reduce such confusion in the future. "Herbs of Commerce" is a must for wholesalers, retailers, and consumers, as well as health professionals, researchers, and regulators.

Edited by botanist Steven Foster with the assistance of the following Scientific Advisory Panel: Dr. Dennis Awang (Bureau of Drug Research, Natural Products Division, Health and Welfare Canada), Dr. Shin Ying Hu (Arnold Arboretum, Harvard University, retired), Dr. John Kartesz (North Carolina Botanical Garden, University of North Carolina at Chapel Hill), Dr. Arthur O. Tucker (Dept. of Agriculture and Natural Resources, Delaware State College), and Dr. Varro E. Tyler (School of Pharmacy and Pharmacal Sciences, Purdue University).

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MARKET REPORT

INDONESIA ACCOUNTS FOR LARGEST SHARE OF U.S. SPICE IMPORTS

by Rex T. Dull, Foreign Agricultural Service.
U.S. Spice Trade *Circular Series April 1993*

U.S. imports of specified spices and herbs in 1992 totaled $369 million. New York was the principal port of entry for these items, accounting for slightly over half of the total. Indonesia, Mexico, Madagascar, and India were the major sources of these imports.

SUMMARY

U.S. imports of specified condiments, seasonings, and flavorings in 1992 increased nearly two percent over a year earlier to $369 million, largely reflecting increased shipments of capsicum peppers, cumin seed, and turmeric. However, lower prices for black pepper resulted in a $10.5 million drop in value for that item to $41.7 million, despite a four percent increase in volume. Pepper (black and white) is the most important spice in world trade and ranks third in importance in terms of value ($50.1 million) in total U.S. imports of specified condiments, seasonings, and flavoring materials. Although down slightly from 1991 levels, vanilla bean imports continued to be the most important item, with shipments totaling $65.7 million. Other important items in U.S. condiment import trade are capsicum peppers (including paprika), $60.4 million; sesame seed, $42.7 million; cassia and cinnamon, $26.6 million; and mustard seed and products, $25.2 million. On a unit value basis, saffron, vanilla beans, and cardamom are the most expensive spices.

The United States depends on imports for two-thirds of its seasoning requirements. Increased demand for ethnic foods has contributed to rising usage of spices. Additionally, the trend towards less salt in foods has stimulated more condiment use to compensate for flavor loss. Food manufacturers and institutions now account for nearly two-thirds of U.S. spice usage, up from 40 percent a decade earlier, reflecting increased consumption of prepared foods and more families eating meals away from home.

U.S. imports of spice oleoresins in 1992 were valued at $30.1 million, slightly below the record 1991 level, because of smaller shipments of black pepper oleo-resin. Total imports of specified condiments, seasonings, and flavorings, including spice oleoresins, in 1992 were $399 million, compared with $395 million a year earlier and $385 million in 1990.

U.S. exports of spices and seasonings (excluding re-exports) in 1992 amounted to nearly $88 million, up from $85 million in 1991 and $78 million during 1990. Dehydrated onions continued to be the most important export item, with shipments totaling $36.1 million, followed by capsicum peppers, $8.9 million; dehydrated garlic, $7.3 million; black and white pepper, $5.8 million; and mustard products, $4.8 million.

Canada, Japan, and Germany are the principal markets for U.S. exports of spices, seasonings, and condiments. Exports consist of U.S. processed and packaged imported items and include domestically produced items such as dehydrated onions and garlic, capsicum peppers, ginger, sesame, and mustard.

SPICE OLEORESINS

Spice oleoresins are obtained from dried spices by extraction with a volatile nonaqueous solvent, which is subsequently removed from the oleoresin by evaporation at moderate temperatures and under partial vacuum. The oleoresin contains the aroma and flavor of the spice (including any nonvolatile principles, unlike spice essential oils) in concentrated form, usually viscous liquids or semisolid materials.

Because of their high concentration, oleoresins cannot be incorporated into food products unless they are diluted. The dilution is usually achieved by dissolving the oleoresin in alcohol, propylene glycol, or another appropriate solvent to make an essence; or by dispersing the oleoresin on a dry carrier, such as salt, dextrose, or starch; or emulsifying the oleoresin with gum acacia, or one of the modified starches, followed by spray drying to produce an encapsulated spice. Demand for spice oleoresins is increasing, as oleoresins offer certain advantages over natural ground spices, such as consistency of quality, freedom from microorganisms, uniform dispersion in the product, and easy handling and storage.

Oleoresins are not only produced in industrialized countries, but well established and modern plants exist in many developing nations, such as India, Singapore, Ethiopia, Indonesia, and Sri Lanka. India's exports of black pepper oleoresin in 1991 was a record 355 tons, compared with 194 tons a year earlier and 270 tons in 1989.

U.S. imports of spice oleoresins, principally paprika and black pepper, in recent years have averaged slightly over $30 million annually. Information regarding the level of U.S. production of oleoresins is not available.

MARKET SITUATION INFORMATION FOR SPECIFIED ITEMS

Black and White Pepper: World pepper prices remained depressed throughout 1992, reflecting abundant supplies and flat demand. New plantings made during the high price levels of the mid-1980s are in their maximum bearing range, and it will take several more years before the effects of reduced cultural practices by growers will fully impact the supply situation. Reduced sales to the former Soviet Union also have contributed to the depressed market for pepper. India was the principal supplier to the Soviet and Eastern European markets through bilateral trade agreements. India's pepper exports in 1991 fell sharply to only 18,735 tons from 34,429 tons a year earlier.

Global pepper exports by principal producing countries in 1991 totaled about 165,000 tons, 12 percent greater than a year earlier, as importers took the opportunity to build stocks during a period of low market

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Courtesy of the American Spice Trade Association

U. S. SPICE TRADE

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prices. Shipments from Vietnam were up sharply to 16,252 tons, compared with only 1,288 tons in 1990. Exports by Brazil also increased sharply, totaling 47,689 tons, against 28,014 tons in 1990. Another large harvest is anticipated for Brazil this year, which will tend to temper any rise in market prices. Indonesian pepper exports in 1991 rose slightly from year-earlier levels to 49,667 tons, while Malaysian shipments fell 8 percent to 25,458 tons. Pepper re-exports by Singapore in 1991 were up 20 percent to 40,707 tons.

New York spot prices for Indonesian Lampong black pepper in 1992 averaged only 56 cents per pound, the lowest since 1972, when prices averaged 46 cents per pound. Prices during the first quarter of 1993 continued weak, averaging slightly under 56 cents. Indonesian Muntok white pepper prices during 1992 averaged nearly 71 cents per pound, about unchanged from a year earlier, but below the 1990 average of 90 cents. Muntok prices during the first quarter of 1993 have strengthened, reflecting reports of a poor Indonesian crop and improved European demand for white pepper.

Black and white pepper come from the same plant; however, the method of processing and maturity of the berries separates the two spices. If white pepper is desired, the more mature berries are soaked in water for several days to facilitate the removal of the outer coating. The ripened berries are then dried, cleaned and bagged. Europe is the principal market for white pepper, as European consumers prefer pepper seasoning without the appearance of the black color in their food.

The United States is the world's largest pepper importer, accounting for over one quarter of the total. Other major importers are the European Community and Russia. Producing countries also consume significant amounts of pepper, with Indian domestic consumption accounting for over a fourth of its production. Singapore remains the principal entrepot for pepper trade, handling significant quantities of Indonesian and Malaysian pepper shipments.

Indonesia was the principal supplier of black pepper to the U.S. market in 1992, accounting for slightly over half of the total. Indonesia is the world's largest producer of white pepper, and accounted for nearly all of U.S. imports of that spice last year.

Ginger: Hawaii's 1992 ginger crop was down 37 percent from a year earlier to only 3,402 tons, reflecting dry weather and significant losses from insects and bacterial wilt disease. Farm prices also were lower, averaging only 55 cents per pound, the lowest in over 5 years. Total farm value fell to $4.1 million, compared with $7.6 million from the record 1991 harvest. A larger crop is expected this year, if weather conditions remain favorable. Virtually all of the crop is produced on the island of Hawaii, with most of the harvest going to the U.S. mainland and to overseas foreign markets.

Prospects of a small Indian crop resulted in a firming of cochin prices during the last quarter of 1992. Strong internal demand, coupled with increased sales to Middle East markets, also contributed to rising prices. New York spot prices for cochin ginger fell to a 1992 low of 54 cents per pound in July, but recovered to 80 cents by the end of the year. However, cochin prices have been declining during the first quarter of 1993, as demand has eased and crop yields have been better than expected. Jamaican #3 ginger averaged $4.24 per pound in 1992, compared with $3.80 a year earlier, while Nigerian ginger prices trended downward, averaging 51 cents per pound for the year.

Nutmegs and Mace: World production continues to exceed demand and prices remain at depressed levels. New York spot prices for Grenadian whole nutmegs averaged $1.99 per pound in 1992, compared with $2.98 a year earlier and $3.23 during 1990. Indonesian nutmegs averaged 67 cents per pound in 1992, down from 74 cents in 1991 and $1.39 during 1990. New York spot prices for Indonesian #2 Siauw mace siftings average $1.31 per pound in 1992, compared with $1.43 a year earlier and $2.61 in 1990. Prices have been in a downtrend since the collapse of the cartel marketing agreement between Indonesia and Grenada in May 1990. The agreement had been in effect since April 1987 and was established to set minimum export prices and quotas for nutmegs and mace. Indonesia and Grenada account for virtually all production and exports of these spices, with Indonesia's share making up three quarters of the total.

Grenada's 1991/92 nutmeg production fell slightly from a year earlier, but exports increased nearly 4 percent, reflecting larger sales to Germany, Canada, Belgium, Spain, and Poland. The Netherlands remained the largest recipient, taking 613 tons, followed by Germany with 475 tons. Exports to the United States were up slightly to 40 tons. U.S. importers continue to buy mostly from Indonesia, as Grenadian nutmegs have a high oil content, which makes grinding difficult. Grenada's mace production fell 31 percent from year-earlier levels and exports also were sharply lower. Germany buys most of Grenada's mace, taking 147 tons, or nearly 72 percent of the 1991/92 shipments. Most of the balance was exported to the United Kingdom and Canada.

Grenada's nutmeg stocks at the end of the July-June 1991/92 marketing year totaled 4,492 tons, 54 percent greater than a year earlier, when stocks levels were reported at 2,914 tons. Mace stocks were 461 tons, compared with 510 tons at the close of the 1990/91 season.

Mustard Seed: Mustard seed is grown commercially in the United States in Montana, North and South Dakota, Washington, Oregon, and California. North Dakota, Montana, and South Dakota are the principal producers. U.S. production in 1992 was 6,579 tons, down 13 percent from a year earlier, reflecting a drop in harvest area from 7,325 hectares in 1991 to 5,989 hectares. Total crop value of U.S. mustard seed production was $1.55 million, compared with $1.75 million in 1991.

The United States relies on imports for most of its mustard seed requirements, with Canada accounting for most shipments. Imports in recent years have been averaging slightly over 55,000 tons annually. The Canadian Government reports that 1991/92 mustard seed production totaled 121,100 tons, compared with 249,500 tons a year earlier and 154,800 tons in 1989/90. Production for 1992/93 was estimated at slightly over 133,000 tons. Grower prices for 1992/93 have averaged Can$215 per ton, compared with Can$212 and Can$291 during the past two seasons, respectively. Grower prices

MARKET REPORT

during 1989/90 averaged a seasonal high of Can$315 per ton (Can$1.00 = US 79 cents). New York spot prices for both Canadian #1 yellow and Oriental/Brown mustard seed averaged 26 cents per pound in 1992, down slightly from year-earlier levels.

Sesame Seed: Ample Central American crops and adequate stocks have had a depressing effect on market prices, despite reports of a short Mexican harvest. New York spot prices for Central American hulled seed averaged only 59 cents per pound during the first quarter of 1993, down from an average of 67 cents in 1992 and well under the 1990 average of 84 cents. Offerings from Indian, Chinese, and African sources also have contributed to a weaker market. Mexico continues as the principal source of U.S. imports, accounting for over half of the total. Shipments from Nicaragua have risen rapidly during the past two years, now ranking it as the fourth largest supplier to the U.S. market after Mexico, Guatemala, and El Salvador.

Cloves: Large Indonesian production and stocks, together with weak global demand, continue to depress clove prices. The Indonesian Government authorized the establishment of a monopoly over the marketing of cloves in January 1991, which has further disrupted market forces in bringing supply and demand into balance. Indonesia is the largest clove producer and consumer, where between 80,000 to 90,000 tons annually are used in the manufacture of "Kretek" cigarettes. Indonesia used to import large quantities of cloves from Tanzania and Madagascar; but through efforts to become self-sufficient in cloves, domestic production has risen sharply and imports have been virtually nil in recent years. Further contributing to the oversupply situation has been the emergence of new producers, such as Brazil, and flat demand in most consuming nations.

The U.S. is not a major clove consumer. Imports in 1992 amounted to only 1,156 tons, valued at $1.5 million, compared with year-earlier imports of 1,140 tons valued at $1.4 million. New York spot prices for Madagascar/Zanzibar cloves for 1992 averaged only 68 cents per pound, down from $1.04 in 1991 and $1.39 in 1990. Prices during the first quarter of 1993 have weakened further to an average of only 54 cents.

Cardamom: Increased demand for mid- and lower-quality cardamom from the Middle East consuming countries has caused a sharp price increase in March 1993, with New York sort prices for decorticated seed jumping by 90 cents per pound to close out the month at $3.35 cents per pound. Prices for mixed greens also increased, reaching $1.95 per pound by the end of March, compared with market prices of $1.65 a month earlier. However, prices for the top quality bleached "AA" seed eased by a $1 to $14 per pound for the same period. Saudi Arabia and Kuwait are the principal consumers of cardamom, where it is used in coffee preparations. India and Guatemala are the major producers, although Indonesia and Thailand have become significant exporters in recent years. Guatemala is by far the largest exporter, as most of India's crop goes for domestic consumption. The United States is a minor importer of cardamom. U.S. imports in 1992 totaled only 169 tons, with most of the shipments coming from Guatemala.

Turmeric: A large Indian crop, coupled with the rupee devaluation, has pushed turmeric prices to sharply lower levels. Indian Alleppey (5.00 curcumin) New York spot prices in March averaged only 62 cents per pound, down sharply from a year earlier prices of $1.40 per pound. Turmeric is widely used as a food coloring agent, particularly in mustard products. Most U.S. imports are from India, which accounted for over three-quarters of the 1992 shipments of 2,606 tons.

Vanilla Beans: U.S. vanilla bean imports in 1992 fell nearly 4 percent from a year earlier, as importers and users utilized stocks from the large 1991 shipments to meet demand. Indonesia continued as the largest supplier to the U.S. market, reflecting the significantly lower price for "Java" vanilla beans, compared to that from most other sources. March 1993 New York spot prices for Indonesian vanilla beans averaged $9.50 per pound, compared with "Bourbon" vanilla and Mexican beans selling for $36 and $36.50 per pound, respectively.

The trend toward natural flavoring in food products continues to keep demand for vanilla beans steady, despite strong competition from synthetic flavorings, such as vanillin. Vanilla is the most popular flavor in the United States, and accounts for nearly one-third of all ice cream sales. Ice cream is the largest use for natural vanilla, accounting for nearly half of the market. Most vanilla flavoring used in baking, confectionery, and in many frozen desserts, contains some vanillin, ethyl vanillin, vanitrope, or a combination of these products. Vanillin accounts for over 90 percent of the U.S. market for vanilla flavorings. The market for synthetics will likely remain strong because of their relatively low and stable prices, as well as their reliability of supply and quality.

Capsicum And Paprika Peppers: U.S. imports were up sharply in 1992, reflecting increased shipments of unground capsicum peppers from India and Pakistan and large shipments of ground capsicums from Mexico. However, smaller shipments of paprika from Spain resulted in a 21 percent drop in imports of that item. Spain, Morocco, Israel, and Hungary were the principal sources of U.S. paprika imports, while Mexico, India, Pakistan were the main suppliers of other type capsicum peppers. New Mexico and California produce significant amounts of capsicum and paprika peppers for the domestic market. Production data for California was discontinued in 1990. ❑

Errata

Page 59 of HerbalGram #30 announced a new publication, *Phytomedicine*. However, the ordering information was inadvertently omitted.

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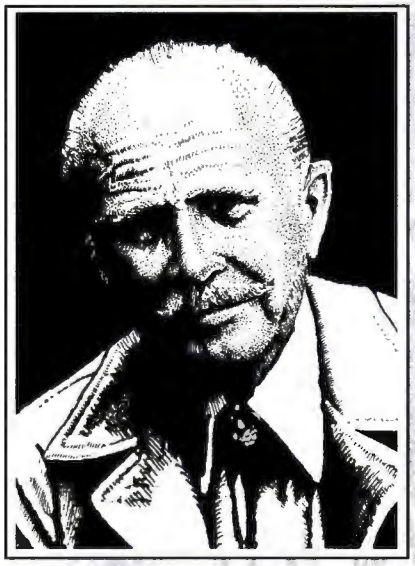

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Howard Scott Gentry 1903 - 1993

Howard Scott Gentry was a distinguished agricultural explorer, plant hunter, and research botanist whose career extended for sixty years. His interests were diversified and his contributions to economic botany were numerous and valuable. During his many explorations in twenty-four countries, he collected over 15,000 germ plasm accessions including food crops, forages, common beans, ornamentals, oil seeds, rubber, and medicinal plants.

He was a man of deep integrity, modesty, and generosity, who shared his vast experience and knowledge of the plant world with all. As a dean among economic botanists, his work and writing have inspired several generations—a man who will be personally missed by researchers and small farmers in the Southwest.

After spending his youth as a farmer in Imperial Valley, California, he received a B.A. degree in vertebrate zoology from the University of California, Berkeley, in 1931. He became a free-lance biologist and fossil hunter, collecting specimens in the Sonora, Arizona, Baja, and Nevada deserts from his base at the Carnegie Desert lab in Tucson. He once wrote that environment is the mother of adaptation, and there is a lot of mother in the desert, for only the adaptable survive the stress of heat and drought.

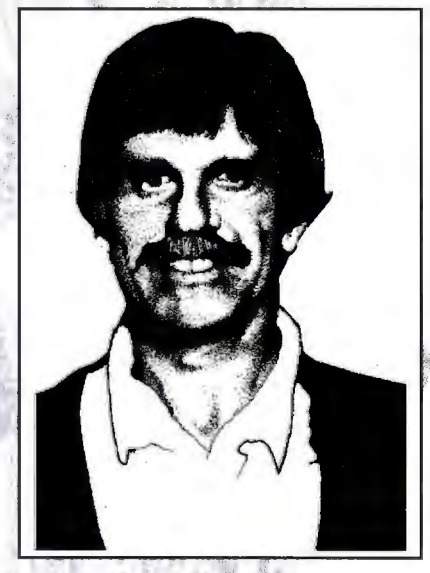
In 1942, when Pacific sources of Hevea rubber were obstructed by World War II, Gentry—at the behest of the USDA—led a field survey party into Mexico searching for plants which could be grown domestically to produce this critical material, primarily *Parthenium* (guayule) and *Cryptostegia* (rubber vine). As a result of his three-year research on the cultivation and harvesting of *Cryptostegia*, in 1977 he was the choice of the National Academy of Sciences to serve on an advisory panel on guayule.

After the war, he completed his studies for a Ph. D. in botany at the University of Michigan. He then served as research associate at the Allen Hancock Foundation, University of Southern California, Los Angeles. He joined the U. S. Department of Agriculture in 1950 as a research botanist in plant exploration and introduction, conducting eighteen expeditions into Middle Eastern, Balkan, Western European, South African, and Latin American countries as well as the Southwestern United States. His mission was to collect anything of interest to U. S. agriculture. He was deeply involved in studies of agaves as producers of sapogenins, *Dioscorea* species as a source of steroids, and one yam sapogenin, Gentrogenin, which was named after him. Among other influences he had, Dr. Gentry's articles, published in *Economic Botany,* encouraged the growth of a number of agricultural industries— tragacanth (1957), jojoba (1958), and common beans in Mexico (1969).

After retirement from the USDA, Gentry pursued his research in agaves and other desert plants at the Desert Botanical Garden, Phoenix, Arizona, until 1987, supported in part by the National Science Foundation. In 1982, the University of Arizona Press published his *Agaves of Continental North America*, a definitive 670-page volume on this useful desert plant. His Gentry Experimental Farm, at Murrieta, California, continues his research.

Dr. Gentry is survived by his wife of sixty years, two daughters, and two grandsons.

This article is based on information from an article by Anthony J. Verbiscar in Economic Botany *47 #3 pp. 335-337. ©1993, by the New York Botanical Garden.*



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Charles T. "Chuck" Stevens 1940 - 1994

Chuck Stevens, a partner in The Whole Herb Company, passed away at his home in Fairfax, California, on February 8, 1994. He was born on June 13, 1940, in Long Island, New York. He attended college at the University of Maryland, and often joked that his bartering skills were honed during his military service.

Stevens spent nearly twenty years in the herb and spice industry, working for both Fmali Herb Company and Botanicals International before joining The Whole Herb Company in 1979. He was the first secretary of the American Herbal Products Association (AHPA) when it was founded in 1983. His first love was the field of botanicals and he was one of those rare people who combined true professionalism and extensive knowledge of his business with a real warmth of personality and sense of humor. He also loved

In Memoriam

sailing and travel and had a special affinity for languages, especially Italian and Spanish, which he began studying several years ago.

His knowledge and guidance, his wealth of experience and his caring friendship will be missed by all those who knew him, both in the herb industry and at The Whole Earth Company.

Stevens is survived by his two grown children, Helen and John Stevens. The family requests that any memorial contributions be made to the donor's favorite charity.



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Wade Boyle 1945-1993

Dr. Wade Boyle, Naturopathic physician, educator, author, publisher, and associate editor of *Medical Herbalism*, died of cancer on October 3, 1993, at the age of forty-eight. Boyle was a scholar of the Eclectic and Physio-medicalist botanical literature and of the history of nature cure in Western Europe and the U.S. He was also a careful clinical observer who contributed significantly to the development of Naturopathic botanical medicine.

Boyle received a bachelor's degree in English from the College of Wooster and a Master of Divinity from Hartford Seminary Foundation, Hartford, Connecticut. While working as a minister in Hartford, he learned about the vegetarian diet and alternative medicine. He first heard of Naturopathic medicine on a Connecticut radio talk show, and sought treatment from the physician, an experience which whetted his appetite for the art. Upon receiving a catalogue from the National College for Naturopathic Medicine, he was disappointed to see that, despite his advanced education, he would need to spend six more years in school to obtain his M.D.

"I was thrashing around trying to figure out what to do with my life," he said of that time in an interview shortly before his death. He had a dream that he was in an airport; his father had a heart attack and Boyle could not figure out what to do for him. He woke very upset about the helplessness he felt, then took the dream as direction for his life and resolved to study Naturopathic medicine. "I never really thought of Naturopathic medicine as a way to make a living," Boyle related, "but rather as a way to take care of my family when they were sick." He eventually was able to provide what he called "rational medical care" when his father suffered from cancer.

Boyle graduated from National College in 1983, completed an internship there, and moved to eastern Ohio, a state which has no provision for licensing Naturopathic physicians. After some research he discovered a law on the books for the practice of "mechanotherapy," and eventually successfully sued the state to obtain the right to practice under that law.

For eight years he worked at Mantell Clinic in Cranberry, Pennsylvania—outside Pittsburgh—using herbs, hydrotherapy, fasting, and nutrition to treat thousands of chronically ill patients, many of them suffering from cancer. He taught at the Canadian College of Naturopathic Medicine and the Chautaqua Institution. He was a popular presenter in botanical medicine at continuing education seminars of the American Association of Naturopathic Physicians, and served as an advisor in materia medica for the Naturopathic Physician's Licensing Exam.

I first met Wade Boyle at a lecture he was giving at a Naturopathic convention. From the podium he called himself a "meat and potatoes" herbalist, clarifying this by joking that his "placebo factor" was probably pretty low. This prompted a reaction from the audience when he next explained that, to really know a proper herbal prescription, he had to "get his hands on the patient." The crowd thought he was talking about gaining an intuitive insight. Boyle then proceeded to explain the elements of a botanically oriented physical examination, solidly grounded in the basics of anatomy and physiology, using various palpation techniques to find the indicated herbal remedy. Palpation for liver enlargement, for instance, can help distinguish between different botanical liver strategies, or palpation of the pulse in the epigastric artery can determine the state of stagnation in the spleen, and indicate other remedies.

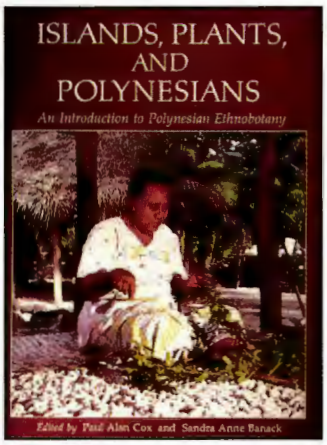
Those who knew Boyle will remember his humility, his kindness, his wry sense of humor, his careful attention to both scholarly and clinical details, his passionate love of both nature cure and medicinal plants, and his desire to preserve these for humanity in an era dominated by reductionist medical science.

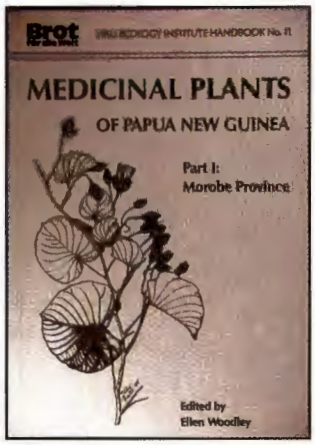
Among his legacy for the community of medical herbalists are *Naturopathic Hydrotherapy*, *Reading the Eye, Pulse and Tongue for the Indicated Remedy*, *The Herb Doctors*, and *Official Herbs: Botanical Substances in the United States Pharmacopoeias, 1820-1990*.

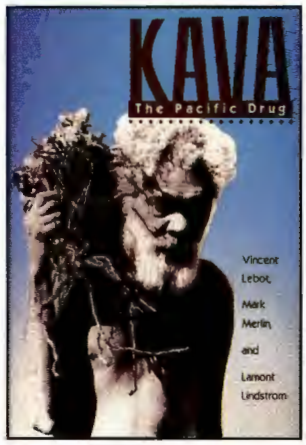
The loss of Boyle to American herbalism is the equivalent of losing, in mid-life, Eclectic giants Harvey Felter or John Uri Lloyd, or the modern phytotherapist R. F. Weiss. We would have benefited greatly from another thirty years of Boyle's observations, teaching, and publishing.

He is survived by his mother, wife, two sisters, and three sons. Contributions may be made to the Wade Boyle Fund, c/o AANP, 2366 Eastlake Ave. E., #322, Seattle, WA 98102. — *Paul Bergner*

BOOK REVIEWS







Islands, Plants, and Polynesians: An Introduction to Polynesian Ethnobotany, *by Paul Alan Cox and Sandra Anne Banack (Eds.). 1991. Dioscorides Press, Portland, OR. 240 pp. B&W Photos. Hardcover. $34.95. ISBN 0-931146-18-6. Available from ABC Books.*

This book is a result of a symposium sponsored by the Institute of Polynesian Studies of the Brigham Young University, Hawaii Campus. It offers an excellent overview of the history, culture and language of Polynesia and the various uses of plants in the region of the South Pacific islands. The book contains 10 chapters on various aspects of Polynesian Ethnobotany. Of particular interest to *HerbalGram* readers is Paul Cox's excellent chapter on Polynesian herbal medicine in which he discusses Polynesian theories of disease causation and the various medicinal plants employed. (For a related article, see p.10). Cox emphasizes the cultural aspects of herbal medicine in Polynesia and its historical origins. Of specific interest is the chapter by Vincent Lebot on Kava (*Piper methysticum*), the most important social beverage and plant intoxicant of the region. (Lebot is a co-author of the book on Kava, reviewed on this page.) The Kava chapter includes botanical aspects, origins, its geographical distribution, myths and legends associated with its origins, methods of preparation, physiological effects, traditional pharmacopoeias in medicine, active constituents, and related chemical and agronomic distinctions. This collection represents some of the best information available on the ethnobotany of this region and for many years will most likely stand as one of the leading references in this field. — *MB.*

Medicinal Plants of Papua New Guinea, Part I: Morobe Province, *by Ellen Woodley (Ed.). 1991. Verlag Josef Margraf. Mühlstrasse 9, P.O. Box 105, D-6992 Weikersheim, Germany. 158 pp. Softcover. Illustrations and photos. $35 US. ISBN 3-8236-1125-2.*

This is a first in the series of works designed to document native uses of medicinal plants of Papua New Guinea. This volume was prepared by six different authors, all specialists in medicinal plants of the area. The handbook contains 127 species from 71 gathered in 20 villages representing 58 percent of the 122 plant families with medicinal properties found in the entire country. Seventy different medicinal uses for 70 different types of treatment are documented. Each monograph contains the binomial description, plant's ecology, habitat, and distribution, medicinal use, chemistry, and local names as well as village names. Realistic line drawings accompany many of the monographs. Beautiful color photographs adorn this excellent volume, depicting the uses of medicinal plants in the South Sea islands collectively known as Polynesia (Tonga, Samoa, Tahiti, Cook Islands, Hawaii). The book offers a general history of the background, culture, languages, and migrations of Polynesian peoples and an overview of their medical practices and culture beliefs surrounding medicine and medical practices, both from a theoretical perspective, as well as how they are employed today. Brief monographs on 90 selected medicinal plants include the range and habitat, medicinal uses, and non-medicinal uses (if any); local names for each culture are also given. The plants are arranged alphabetically by botanical name with a color photo of each plant. The book includes an extensive bibliography and index. — *MB*

Kava: The Pacific Drug, *by Vincent Lebot, Mark Merlin, and Lamont Lindstrom. 1992. Yale University Press, New Haven, CT. Hardcover. 255 pp. $45. ISBN 0-300-05213-8. Available from ABC Books.*

This book constitutes the definitive work on this interesting traditional plant of the South Sea islanders. Kava (*Piper methysticum*) is employed as a "Southsea cocktail" in Samoa, Tonga, Fiji, and even as far north as Hawaii where it was introduced by Polynesians centuries ago. The title of the book is a double entendre connoting not only the geographical source of the herb, but also one of its primary properties. Ritual use of Kava drinks is employed for a variety of social and cultural purposes, including marital rites, as well as a form of dispute resolution wherein the opposing parties imbibe the drink made from the root which has the effect of pacifying the disputants and aiding them in resolving their differences. The herb has been used as a mild sedative and currently a European manufacturer is developing semi-synthetic sedatives from the kavalactones, the principal active ingredients.

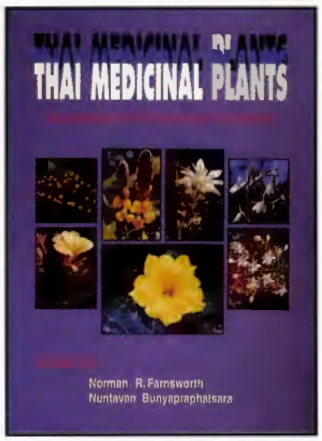
The book is divided into seven primary chapters: Botany: Morphology, Biogeography, and Origin; Chemistry: Active Principles and Their Effects; Ethnobotany: Cultivation, Classification, Preparation, and Medicinal Use; Anthropology: The Cultural Significance and Social Uses of Kava; Economics: Kava as a Cash Crop; and Kava: A World Drug?

The authors are quick to point out that contrary to some previous ethnobotanical writing based on observations by British explorer Captain James Cook in the 1700s, "Kava is neither a hallucinogenic nor a stupefacient. Rather, the drug is a mild narcotic, a soporific, a diuretic and a major muscle relaxant." It should be noted that in

BOOK REVIEWS

this case these authors use the term "narcotic" to refer to a sleep-inducing substance—not in the modern sense where the word often is used in terms of the illicit drugs that cause a high degree of chemical dependency. The authors continue, "Kava may induce sociability, feelings of peace and harmony, and in large doses, sleep, or it may fail to produce relaxation and provoke nausea. Typically, however, Kava evokes an atmosphere of relaxation and easy sociability among the drinkers." They continue, "Although we use the terms intoxication, drunkenness, and inebriation to describe human physiological reaction to the plant, this state differs from that induced by ethanol or other familiar drugs found in the Western world."

There is no doubt that Kava will become increasingly popular as an ingredient in herbal products during the 1990s. Health professionals, herbalists, and members of industry are well-advised to obtain this important and comprehensive book. — *MB*



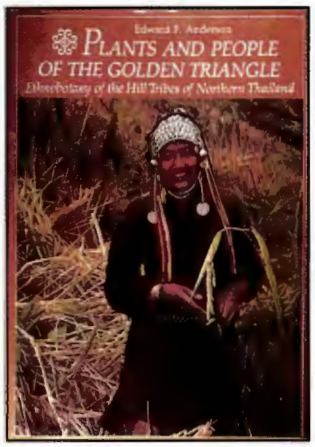
Thai Medicinal Plants Recommended for Primary Health Care System, *by Norman R. Farnsworth and Nuntavan Bunyapraphatsara, (Eds.) Published by Medicinal Plant Information Center, Faculty of Pharmacy, Mahidol University, Bangkok. Distributed by the American Botanical Council, P.O. Box 201660, Austin, TX 78720. 402 pp. Hardcover. $89. ISBN 974 0587-498-1. Available from ABC Books.*

Thailand, like many developing countries, has placed emphasis and resources into the development of medicinal plants to provide health care to a larger population at a reduced cost, not dependent upon Western orthodox medicine. The present volume seeks to support the development of medicinal plants while minimizing problems associated with plant identity and nomenclatural confusion, improper usage, and the hesitation of medical doctors to use medicinal plants because of a perceived lack of scientific data. Meant as a reference manual for physicians, pharmacists, and other health care professionals, the book provides substantial scientific data on all aspects of over sixty commonly available medicinal plants. This large format book includes dozens of color photographs, showing the plant in flower or fruit, the crude drugs, and other details.

Non-Thai readers should not be deterred from purchasing the book because of its regional Thai focus. More than half of the medicinal plants treated in detail are commonly available on world herb markets. This list includes garlic, aloe, safflower, senna, lemon grass, citronella, hibiscus, basil, cloves, ginger, and many others.

The information presented in this book is nothing if not comprehensive. Major sections under each of the sixty major entries include common and regional names, a botanical description, ecology and distribution, propagation, ethnomedical uses, traditional remedies, chemical constituents, pharmacological activities, and clinical trials. Here the medical practitioners, who may be skeptical about medicinal uses of plants because of "lack" of scientific data, are given enough material to make them realize that ignorance on the use of the plant is theirs alone. The garlic chapter, for example, spans 25 pages, and contains more information than found in most review articles I have seen on the plant. Hypocholesterolemic effect, antiplatelet aggregation, fibrinolytic, hypotensive, antidiabetic, antibacterial, antifungal, anthelmintic, anticancer, antimutagenic,and antiprotozoa activity, effects on insects, carminative effect, effect on the uterus, spermaticidal activity, antiinflammatory activity, immunomodulating activity, and toxicity assessment are some of the 29 categories reviewed in detail under the "pharmacological activity and clinical trial" section on garlic. All information is fully referenced. Under garlic are 466 complete citations to original research in the bibliography, much of it from the last decade.

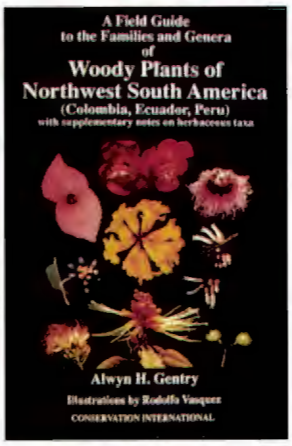
This book is a rich source of information. Rather than being placed on a bookshelf across my study with a collection of other Southeast Asian medicinal plant references, this book will be placed close to my desk, where I can refer to it often. —*SF*



Plants and People of the Golden Triangle: Ethnobotany of the Hill Tribes of Northern Thailand, *by Edward F. Anderson. 1993. Dioscorides Press, Portland, OR. 279 pp. Color photos. Hardcover. $69.95. ISBN 0-931146-25-9. Available from ABC Books.*

This ethnobotanical treatment of the Hill tribes of Thailand is written for everyone to enjoy. It is a thorough treatment of these people's lives and their relationship with their surroundings. In the chapter, "Plants That Cure," Dr. Anderson states that he has collected over 700 medicinal plants. After reading this chapter, it is obvious that Ted Anderson has spent many years accumulating the knowledge that accompanies those plants which he shares with us. He not only lists the plants and has two hundred exquisite color photos to demonstrate the beauty of the people, but also provides a meaningful understanding of the people's daily lives, past, present, and future. No matter what your ethnobotanical interest is, you can find it in this book. The book includes various appendices and indices of common and scientific plant names. Local Thai names are included in the text, but, unfortunately, there is no index for them. The book offers an excellent opportunity to appreciate the beauty of the culture, people, and plants of this area. — *Trish Flaster*

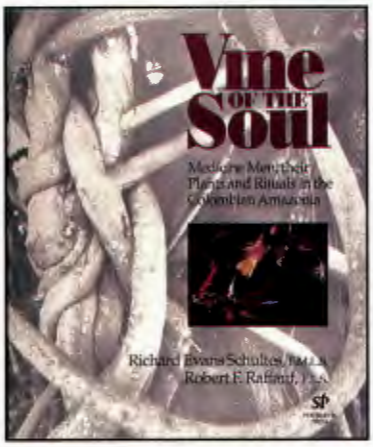
BOOK REVIEWS



A Field Guide to the Families and Genera of Woody Plants of Northwest South America (Colombia, Ecuador, Peru), *by Alywn H. Gentry. Illustrations by Rodolfo Vásquez. 1993. Conservation International. Softcover. 895 pp. $39.95. ISBN 1-881173-01-1. Available from ABC Books.*

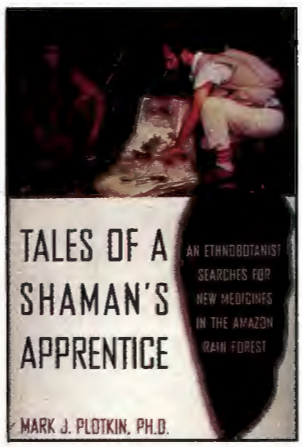
This is a totally new type of field guide. Using his pragmatic field abilities, Dr. Gentry has provided a novel approach to identification when flowering and fruiting materials are absent—often the case when collecting in the tropics—by using sterile vegetative characteristics such as leaves, bark, wood, and odor as guides to generic and family determinations. His often unique descriptions and keys emphasizing leaf morphology thereby allow the naming of many plants correctly to genus, which would otherwise be impossible. Mr. Vásquez's drawings are also a great help in finalizing determinations.

All plant families which contain woody, epiphytic, or scandent species in northwestern South America are found in this treatment, even if most of their species are herbaceous. Thus many herbaceous genera are also incorporated. According to Dr. Gentry, most neotropical plants are surprisingly easy to identify to family, even in a sterile condition. Indeed, with his guide, we stand a chance to live up to his expectations of sorting through the maze of tens of thousands of species to be encountered there, but without it I suggest that it is an impossible task for the majority of botanists. Dr. Gentry has therefore provided science with an invaluable field-oriented manual, a totally indispensable tool for those working in the neotropics and particularly in northern South America. *— Walter H. Lewis, Professor of Biology, Washington University*



Vine of the Soul: Medicine Men, Their Plants and Rituals in the Colombian Amazonia, *by Richard Evans Schultes and Robert F. Raffauf. 1992. Synergetic Press, Oracle, AZ. Softcover. 282 pp. $22.95. ISBN 0-907-791-24-7. Available from ABC Books.*

This book is destined to become a classic. It is a collaborative effort between two authors who are considered world class experts in the fields of ethnobotany and medicinal plant chemistry, respectively. The book contains a foreword by Ghillean T. Prance, director of the Royal Botanic Garden at Kew, England, and an epilogue by Michael J. Balick, director of the Institute of Economic Botany at the New York Botanical Garden. This book is based on over 50 years of Professor Schultes' work in the Colombian Amazon documenting the native uses of medicinal and psychoactive plants. Unlike the previous collaboration, *The Healing Forest*, this work has generous photographs on almost every page and is more designed for a lay audience. The black and white photographs are striking and, as is the case with some black and white films, they offer a setting and tone to the book that could not be much more amplified even if they had been in color. The first section of the book consists of a historical introduction of ethnobotanical voyages by the first ethnobotanists and naturalists into this area, starting with von Martius who first entered the Colombian Amazon in 1820. Thus, the authors establish excellent historical perspective which is particularly useful for neophytes and students. Then begins a series of short monographs replete with photos and illustrations on many of the interesting plants of this area. The first of these is caapi, also known as *ayahuasa* or *yagé (Banasteriopsis caapi)*, a plant that has been fascinating botanists, chemists, anthropologists, and medical researchers for over 50 years. This vine is used with other plants to produce a trance-inducing or hallucinogenic mixture which is imbibed during native religious ceremonies in Amazonia. Because of the interest in this ritual plant, these lianas or vines of the *ayahuasa* are becoming increasingly scare in the rainforest and are now being cultivated in secret gardens by local Shamans. As interest in medicinal and psychoactive plants from the Amazonian rainforest continues to increase and, as some of these plants become threatened by destruction of rainforest habitat, ethnobotanical works such as this, written by universally acknowledged experts in this field, will become cherished additions to the libraries of all students of ethnobotany, rainforest, and plant conservation as well as anthropologists and those interested in the study of indigenous culture—not to mention chemical, pharmacological, and medical researchers who might be able to develop new classes of beneficial drugs from the ancient traditional knowledge surrounding these plants.— *MB*



Tales of a Shaman's Apprentice, *by Mark J. Plotkin. Viking Penguin, 375 Hudson St., New York, NY 10014. 1993. 318 pp. Hardcover. $22. ISBN 0-670-83187-9.*

"The old man squatted on his haunches and turned to face the sun like some primeval bird trying to absorb enough solar energy to make one last flight." Plotkin, 1993.

"Far from saying that time means nothing to an Indian, I would suggest that it means so much more to him that he does not wish to waste it in profitless effort like we do." Edgar Anderson, as quoted on p. 222, Plotkin, 1993.

BOOK REVIEWS

I have enjoyed eight separate ecotouristic weeks with the Yagua Indians of Amazonian Peru now, on at least one occasion accompanied by more than 100 ecotourists, all in their way contributing to the salvation of one of the most diverse forests in the world. These ecotours are in conjunction with International Expeditions of Birmingham, Alabama, and their tax-exempt arm, the Amazonian Center for Environmental Education and Research (ACEER). For many of the ecotourists it is their first trip to the rainforest; but many try to get back after their first taste of tropical biodiversity. Almost all novices ask about reading materials to help prepare them for their trip, and, after their return to the Northern Hemisphere, to remind them of the beauty they left behind at the ACEER camps. I am especially pleased to recommend a book whose royalties will contribute to the salvation of the rainforest.

Mark Plotkin's exciting new book is pleasant reading, well laced with historical, geographical, and ethnobotanical tidbits. The reader can enjoy it while preparing for a tropical ecotour and pick up some pointers about tribal and botanical etiquette in the tropics. Would that my books were as typo-free as Plotkin's!

Having been in the field at least three times with hyperallergenic (to bee sting) people (who had run off without their allergy kit) in the last year or two, I was particularly interested in Plotkin's comment (page 222) about a cacao relative (*Theobroma*) used for swollen testicles and ant stings. Perhaps xanthines (theophylline, theobromine) {like ephedrine}, have some antihistaminic or antianaphylactic as well as antiasthmatic activity that could be useful in bee stings. Perhaps sublingual applications of ground cacao seeds might be useful, as I've been told that sublingual application of norepinephrine-containing plants (such as purslane) might be useful in life-threatening situations where no benadryl kit is available.

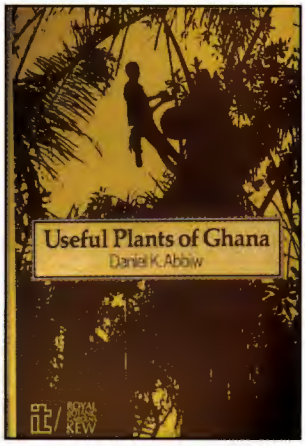
Returning to Amazonian Peru, I enjoy reading and rereading books that relate to areas I plan to visit. The books don't always agree, but there is often disagreement among anthropologists, botanists, brujos, curanderos, doctors, ethnobotanists and hechiceros about their phytomedicinal data and its reliability. As Plotkin notes, it's most exciting when one finds that the ethnic group with which he is working has discovered independently the same applications used by other ethnic groups. Empirical wisdom scores again!

Plotkin teaches us some of the empirical wisdom of the tribes with which he worked. It's great, even humorous, reading, and highly recommended, even to those who have no desire to go ecotouring in the tropics, and to those who prefer to experience the rainforest vicariously, via reading. — *Jim Duke*



Rainforest Remedies: One Hundred Healing Herbs of Belize, *by Rosita Arvigo and Michael Balick. Text Illustrations by Laura Evans. 1993. Lotus Press, Twin Lakes, WI. Softcover. 219 pp. $9.95. ISBN 0-914-955-13-6. Available from ABC Books.*

This booklet is an important contribution to the documentation of the ethnobotany of the Mayan Indians of Belize (formerly British Honduras). Originally intended as a guide for botanists and eco-tourists in Belize, the book is based on the work of Rosita Arvigo and her husband, Gregory Shropshire, in collaboration with Dr. Michael Balick of the New York Botanical Garden, as they attempt to document the vanishing knowledge of Mayan Indian healers in the area. Short one-page monographs give information on each herb's scientific name, plant family, description, habitat, and traditional uses, and scientific research gathered from the NAPRALERT database at the University of Illinois at Chicago. The traditional uses are compiled from reports from traditional healers and personal observations by the authors of use of the plants by indigenous populations of Belize. The book begins with a glossary which includes botanical and medical terms as well as local Spanish and Indian words used in the text. The authors have made a valuable contribution to the literature on ethnobotany of both rainforest medicinal plants as well as the little-known practices of healers of this beautiful region. Future generations of ethnobotanists, researchers, herbalists, and others interested in traditional medicine, preservation of culture, and new drug discovery owe a large debt of gratitude to Drs. Arvigo and Balick for their efforts in documenting this endangered wisdom.— *MB*



Useful Plants of Ghana: West African Uses of Wild and Cultivated Plants, *by Daniel K. Abbiw. 1990. Intermediate Technology Publications Limited, 103/105 South Hampton Row, London, WC1B 4HHUK. Hardcover. 337 pp. $57. ISBN 1-85339-080-1.*

Ghana, formerly known as the Gold Coast, is a West African nation with a rich biodiversity. The true goals of Ghana may lie in its rich medicinal plant diversity. This present volume outlines the many uses of hundreds of plants of this region. Of particular interest to *HerbalGram* readers is Chapter 8, "Potions and Medicines," which details the medicinal uses of dozens of native West African plants. Also of interest is Chapter 9 on "Poisons, Tannin, Dyes, Etc." The book contains an extensive bibliography and extremely detailed index to facilitate the book's overall utility. — *MB*

BOOK REVIEWS



The Complete Medicinal Herbal, *by Penelope Ody. Dorling-Kindersley, Inc., 232 Madison Avenue, New York, NY 10016. 1993. 192 pp. Hard-cover. $29.95. ISBN 1-56458-187-X. Available from ABC books.*

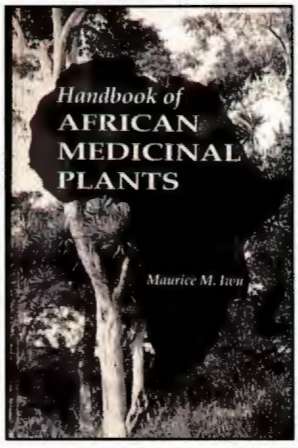
If I see another herbal with the descriptors "complete" or "encyclopedia" I may refuse to open it. Get beyond that title, though, and Penelope Ody's new *Medicinal Herbal* begins to look and feel different from the rest of the pack. What sets this book apart from the many glossy-colored general books on herbs is both content and presentation. Without reading a word, one can't help but be struck by the presentation. The book is divided into several major sections, including short introductory chapters on historical aspects of the subject, and the relevance of medicinal plants in a modern context. Brief snippets give the casual reader an essential feel for the historical context, rather than any substantive information. This, given the book's obvious target audience, the uninitiated lay reader, is a positive. Another section of the book, "herbal remedies," includes the obligatory "how-to" instructions—how to make herb tea, a compress, an herbal first aid kit, etc. The "Home Remedies" section is essentially a compilation of expanded tables on the use of herbs for specific maladies from aches and pains to children's complaints. You'll also find sections on "other medicinal herbs" (filler pages), an interesting essay on "consulting an herbalist," an obligatory rather than substantive bibliography, and lists of useful addresses. The book features a foreword by *HerbalGram's* Mark Blumenthal.

The heart of the book is an "A-Z Medicinal Herbs" directory. This section, arranged by scientific name, treats more than 120 different herbs. It is a visual directory, with nearly every plant, still live, photographed against a seamless white background. Use of warming filters by the photographer give each photograph that "sunset-like" light quality. Lighting is carefully achieved as well to create a three dimensional feel. The only thing the publisher neglected in the sensory presentation is a scratch and sniff feature.



Along with the plant are images of its products, the dried herb, or dried useful part, tincture in a Petri dish, capsules, or the essential oil in a clear glass vial. The reader is given the chance to see what the herb really looks like. Accompanying the photo on each page are notations on character, constituents, and action, along with cautions, applications (e.g., infusion, tincture, compress, eyewash, and others), the plant part used, and a description of when it is harvested, how used, topped with an illustration and quotation from a classic herbal.

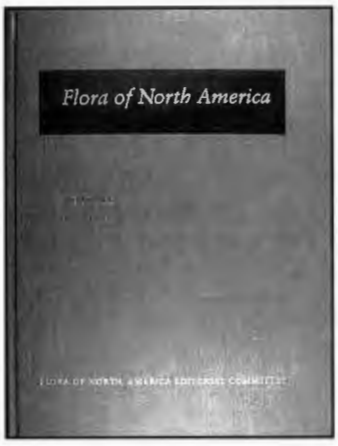
Another aspect of this book that sets it apart from others is its obvious synthesis of tradition, including historical European data, modern phytotherapy facts, and subtle nuances from Chinese and Ayurvedic traditional medicine systems, reflecting the author's training and interests. Those looking for an entry-level quick reference will find Ody's *Complete Medicinal Herbal* a book that can be recommended with confidence. — *SF*



Handbook of African Medicinal Plants, *by Maurice M. Iwu. 1993. CRC Press, Boca Raton, FL. 435 pp. Illustrations and photos. Hardcover. $99.95. ISBN 0-8493-4266-X. Available from ABC Books.*

The author is a professor of pharmacognosy at the University of Nigeria and a research associate at the Walter Reed Army Institute of Research in Washington, D.C. The first part of the book is an extensive table cataloging 1,046 plants used in traditional medical practices in Africa today. Most of these medicinal uses are gleaned from published sources which are cited in the tables. The second part of the book contains the pharmacognostic profiles of 152 selected medicinal plants. Included in each brief monograph are the Latin names and synonyms, English common name and local African name, plant description, habitat distribution, medicinal uses, constituents, citations of pharmacological studies, clinical properties, and toxicity (when available). The third part of the book includes chapters on healing and African culture with sections on African traditional healers, spiritual and cultural aspects of healing, and totems and taboos. An additional chapter on "The African Medicine Man" includes training of traditional healers. Different types are differentiated. Finally, a chapter on medicinal plants and traditional healing methods gives lists of plants which are commonly used for various conditions and purposes. The book is extensively referenced with 873 citations. Also, two indices, one on species, genera and families, and another on subject, are comprehensive to the point of being almost exhaustive, making this a truly handy and valuable book, especially considering the relatively reasonable price for a CRC publication. At a time when there is increased interest in medicinal plants for their potential use and traditional medicines within their native cultures, as well as for sources for new drug development, this present volume will no doubt serve the research community as an excellent guide for future investigations. —*MB*

BOOK REVIEWS



Volume 1

Flora of North America: Volume 1 — Introduction. *Edited by Nancy R. Morin. Oxford University Press, 200 Madison Avenue, New York, NY 10016. 1993. 372 pp. Cloth. $75. ISBN 0-19-505713-9. Available from ABC books.*

A comprehensive continent-encompassing flora of North America has been the dream of American botanists since the production of such a work was first undertaken by John Torrey and Asa Gray in the 1830s. Many major countries, regions, or even continents have floras. There is a comprehensive flora of the Soviet Union, a flora of China, and the monumental *Flora Europaea.* And now, the first two of the fourteen-volume *Flora of North America North of Mexico* are here. Its scope: "a synoptic floristic account of the plants of North America north of Mexico; the continental United States of America (including the Florida Keys and Aleutian Islands), Canada, Greenland (Kalatdlit-Nunat), and St. Pierre and Miquelon. The flora is intended to serve both as a means of identifying plants within the region and as a systematic conspectus of the North American flora. Taxa and geographical areas in need of further study also are identified in the flora."

One modern attempt to produce a North American flora was inspired by publication of the first volume of *Flora Europaea* in 1964. From 1965–1973, a committee was formed to undertake the production of a flora of North America. This committee worked under the aegis of the American Institute of Biological Sciences, as well as the Smithsonian Institution, supported by the National Science Foundation, and the National Research Council of Canada, during its years of planning. Unfortunately the project withered in 1973. In 1982 another attempt was made to resurrect the concept of a North American flora. In the summer of 1983 the project began to jell at the annual council meeting of the American Society of Plant Taxonomists. Here the project began to take form supported by the staff and facilities of the Missouri Botanical Garden and other institutions, an advisory panel of administrators for major botanical institutions, and an editorial committee. Ten years later, in the fall of 1993, the same year that the second edition of Volume 1 of *Flora Europaea* was published, comes the landmark American botanical publishing event of the century—the first two volumes of the long awaited *Flora of North America.*

Volume One is a collection of introductory essays which provide a foundation for the Flora. More than two dozen botanists contributed to the essays, which include succinct, yet detailed and fascinating accounts on all aspects of the continent. Part I, the "Physical Setting," has two chapters on climate and physiography, plus soils. Part II, "Vegetation and Climates of the Past," has essays on the history of the vegetation, paleoclimates, paleovegetation, and paleofloras. "Contemporary Vegetation and Phytogeography" comprises Part III, with general essays on vegetation and phytogeography. Many *HerbalGram* readers will find Part IV of Volume One of immediate interest, "Humankind and the Flora," with excellent essays on taxonomic botany, floristics, weeds, ethnobotany, economic botany, and plant conservation. Part V gets to the heart of the Flora of North America, "Classifications and Classification Systems."

I have often observed that in the modern herb arena, even a casual study of botany is one of the most neglected pursuits of herb professionals, whatever their specific interests may be. If this single volume were required reading to enter the herb business, those who deal in North American botanicals would have a much better understanding of their stock in trade. — *SF*

Flora of North America: Volume 2 — Pteridophytes and Gymnosperms. *Edited by Nancy R. Morin. Oxford University Press, 200 Madison Avenue, New York, NY 10016. 1993. 475 pp. Cloth. $75. ISBN 0-19-508242-7. Available from ABC books.*

The second of the projected 14 volumes in *The Flora of North America* portends what is to come. This volume covers the ferns and fern allies, as well as the gymnosperms, familiar to most as conifers or evergreens. The fern and fern allies comprise about three percent of the vascular plants of continental North America north of Mexico, according to Warren H. Wagner, Jr., and Alan R. Smith, in the chapter on Pteridophytes in Volume I. This of course includes club-mosses, spike mosses, quillworts, and horsetails, as well as the ferns.

Next come the gymnosperms—pine trees and such. The 115 species covered here not only include those familiar pines, junipers, firs, and sequoias that may come to mind when one thinks of gymnosperms, but also the monotypic ginkgo family, sago-palm family, and the ephedra family.

If you love field botany, if you love armchair botany, if you have more than a passing interest in wildflowers, trees, shrubs, weeds, herbs, or any aspect of plants growing without cultivation in North America, you will no doubt own *Flora of North America.* The detail is excellent, the information complete. Each species account includes taxonomic details, excellent descriptions, and a brief synopsis of the plant's relationship to humans, especially if toxic, or planted for ornament. Excellent line drawings are included along with a range map for each species. This is the work for which many have waited a lifetime. It has arrived, at an exceptionally affordable price. For the quality of the information, and the quality of the book itself—paper, binding, feel in the hands—$75.00 per volume is a small price to pay. — *SF*

ASIA'S SACRED

Continued from page 25

"This little forest is a thousand years old," Nair explains. "The woman is ashamed to tell you, but her family might get rid of it. Their children have left home, and the old folks find it tiresome to light the lamp each day and perform the necessary Hindu puja (religious ceremony) every six months. And they can earn good money by planting coconut trees where this grove now stands."

Migratory birds sing in the forest. Just outside, cows graze between coconut palms. Evening prayers waft from the mosque. "I would be sad if this sacred grove falls into the hands of nonbelievers," Nair says. "It would be lost. I am sad, but what else can I do?"

Private groves, such as those of the Nair family, are the most threatened of all traditional conservation sites, say Madhav Gadgil and V. D. Vartak, authorities on India's sacred forests. Poor farmers can make huge sums of money, the experts say, by selling their groves to buyers who want to extract timber or convert the trees to charcoal.

Private or community-owned, guarded by Durga or by white elephants, Indian or Chinese or Burmese—what role do sacred groves have in nature conservation?

Vijay Paranjpye, an environmental ecologist, urges that conservationists rethink the concept of protected areas. Instead of legislating wild areas as wildlife sanctuaries—largely a Euro-American concept—it would be wiser to provide legal protection to established sacred groves, he argues. "These represent probably the single most important ecological heritage of the ancient culture in India."

What is clear is that sacred groves and holy forests offer a valid conservation option. "There are many ways of respecting nature," Vithal Rajan says. "The skill is choosing the one that works best."

I reflect on my first visit to the holy Indian grove at Perumbavoor and realize that I have perhaps overlooked a key part of the equation. Like many Indian temples, it provides sanctuary for hundreds of Hanuman langurs, among India's most common monkeys. Their presence is especially appropriate, for the sacred grove at Perumbavoor is said to be the birth-place of Hanuman, the flying monkey general—the god that started it all. ❑

Paul Spencer Sochaczewski (who recently changed his name from Paul Spencer Wachtel) is a MacArthur Fellow and head of Creative Services at WWF-International in Switzerland and a Professional Associate at the Environment Program, East-West Center in Hawaii. He is currently following Alfred Russel Wallace's Asian travels.

JIN BU HUAN

Continued from page 31

that three women in Los Angeles who purchased JBH from the same store were each hospitalized for acute hepatitis that was evidently caused by the ingestion of this compound.[2] Most people use JBH intermittently or for a relatively brief period; with this type of usage pattern, such liver reactions are unlikely to arise or become serious.

According to Chinese experience, THP does not result in any liver toxicity in animals.[8] Toxicology reports [19,20] in Chinese medical journals contain no mention of any cases of liver inflammation or toxic reaction to THP, nor are other isoquinoline alkaloids obtained from herbs reported to cause such problems. In fact, some of the herbs with isoquinoline alkaloids are used to treat viral hepatitis, including corydalis.[20] One of the importers of JBH, Dr. Bing Wong, said that those who become sick may have taken the wrong dosage. "Don't worry," he says, "the Chinese herbs never have side effects."[21] However, a small number of reports of liver and kidney hypersensitivity to Western and Chinese herbs have been appearing in the Western literature during the past few years, suggesting that herbs long regarded as entirely safe may cause health problems for a few individuals. An appropriate response to this situation, short of banning the use of the herb or product, has not yet been established by the FDA or by the trade associations dealing with herbs.

SAFETY CONSIDERATIONS

ITM has advised Chinese medical practitioners in the U.S. to caution their patients to keep herb materials out of the reach of children since product labeling to this effect is usually absent. In most cases, it is highly unlikely that children will consume such materials, especially in quantities that are potentially harmful, because of their form and taste. However, JBH pills are very small and almost tasteless, while the small vials are possibly inviting to inquisitive minds and relatively easy to open. The dosage of alkaloids in the pills is relatively high (many times that found in crude herb materials), which makes them much more convenient for the individual who wishes to take them for pain or insomnia, but also more dangerous in relation to possible overdose. It should also be noted that while the package insert properly describes the content as "alkaloids" and gives approximately the correct amount of alkaloids (the insert says 30%, but Colorado State University chemists measured 36% alkaloids in several boxes analyzed), it misidentifies the plant source of the alkaloids as *Polygala sinensis* (another plant that is known in China by the name Jin Bu Huan, but which does not contain alkaloids). In recently published Chinese literature, the term "alkaloid" is sometimes used to indicate the active component even when it is not an alkaloid, due to poor translation work.[20] Mislabeling of herb products raises an alarm among health workers who may be faced with treating a person who has used the product—how is one to respond when the substance ingested can't be quickly and accurately identified?

Corydalis, in the form of a crude herb or a simple hot-water extract, as is commonly used by practitioners of traditional Chinese medicine, appears to be safe from the point of view of experience and information derived from pharmacology experiments, even if taken in amounts far higher than normally recommended. Most preparations of the herb or the extract are intended to be taken in the dosage form of large numbers of tablets or capsules for ordinary conservative dosing (e.g., Gastropathy Capsules, 6-9 capsules per day; Corydalis Analgesic Tablets, 12 pills per day; American-made tablets containing corydalis as an ingredient, 6-15 tablets per day). This makes substantial overdosing quite difficult, even for children.

Continued on next page

JIN BU HUAN

Continued from previous page

Highly concentrated preparations also appear safe when used in the proper dosage; for example, reactions to THP in JBH, by adults consuming six or fewer tablets, have been limited to rare cases of heightened insomnia, hallucinatory phenomena at night, and nausea; in all cases, these reactions were temporary. Yet, while these pills are safe compared to most over-the-counter drugs, they remain potentially dangerous in overdose because of their concentration and form.

RESPONSE TO JIN BU HUAN

FDA had largely ignored JBH during the time it has been available in the U.S. due to the lack of complaints about it. Following up on the incidents of accidental overdose by children in Colorado, FDA agents in California visited several Chinese herb importers and distributors and told them to discontinue sale of the product. In August 1993, FDA added JBH to a list of Chinese patent medicines that were banned for importation into the U.S.[22] More recently (April 1994), FDA wrote to the Council for Responsible Nutrition, the American Botanical Council, the Herb Research Foundation, the American Herbal Products Association, the National Nutritional Foods Association, and several other organizations, asking them to identify suppliers of JBH and requested that those suppliers desist from selling the product. AHPA has issued an alert recommending discontinuance of all sales of JBH, with the proviso that this action should remain in effect "until claims of toxicity have been investigated."[24] An informal poll of AHPA active members found no members selling JBH.[25] As a result of FDA discussions with Chinese herb importers and distributors, JBH has become virtually unavailable. The problems of mislabeling of the product—both with the incorrect plant source and with medical claims—coupled with the packaging method that does not deter accidental ingestion by children and newly published information about liver hypersensitivity will likely result in continued FDA restriction on its distribution. ❑



Jin Bu Huan tablets. Photo © 1994 Jon Jonitz.

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LETTERS

GARLIC ARTICLE CAUSES GLEE

I read with glee and laugh-out-loud excitement at your exegesis on why the FDA should not accept garlic in your issue No. 30/ Winter 1994. I've photocopied it and shared it with several hip herbologists—of whom there are very few.

Andrea and I have enjoyed the *HerbalGram* for several years, not only for the thoroughness of the articles and their scholarly reliability, but for the intellectual acuity which informs the entire magazine. The garlic article is only the most recent example!

Thanks for remaining a beacon for the herbal community.

Hal Wicke
Brooklyn, New York

FOR STUDENT'S BENEFIT

HerbalGram and related materials [from ABC] will be of great and increasing assistance in my own research and that of my students. I hope that the kind of work that my students and I are doing will prove helpful to intelligent health care reform. We certainly appreciate the kind of work that you and the American Botanical Council are doing!

David Hufford, Ph. D.
Director, The Doctors Kienle Center for Humanistic Medicine
Professor of Medical Humanities
Behavioral Science and Family and Community Medicine
Penn State, Hershey, Pennsylvania

MONTELLANO VS. PLINY

I enjoyed *HerbalGram* issues 26 and 27 very much. I particularly appreciated Number 27 with the Diego Rivera mural on the cover. Although I have traveled in Mexico, and spent time searching out murals, I never saw this one. I always enjoy Steven Foster's photography and exquisite art work. Ortiz de Montellano (1990:20-23) writes that the Badianus is not a good source for knowledge of Aztec medicine because it was written to impress Europeans by fitting it into Pliny's mold. Bernard Ortiz de Montellano and I have a few basic disagreements, but in this I believe he is right.

Margarita Kay, Ph.D. FAAN
Professor Emerita,
University of Arizona
Tucson, Arizona

A QUESTION OF COVERAGE

I was alerted to *HerbalGram* by "Health Concerns Co." This company sells Chinese herbal formulas that have been "fine tuned" to the needs of North American consumers by the extremely knowledgeable Subhuti Dharmananda, Ph.D. I notice that Dr. Dharmananda is on the advisory board of the Herb Research Foundation. Thus, it is with great surprise that your wonderful advisories to the FDA include nothing about either



Hollyhock, *Althaea rosea*

Oriental or Ayurvedic herbal knowledge. At least the French include the importance of combination products. The balanced nature of combined herbs in the Oriental formulas is a key concept which could be of huge benefit if Western cultures could be open to ideas from other cultures.

A huge amount of biochemical analysis of its herbs has been done in China since the 1950s. Dr. Dharmananda is well connected with the sources of this past and present research.

Another concern of mine is about allowing certain herbs to be restricted because they are "carcinogenic." The early work on discerning if something was carcinogenic was done by Bruce Ames, a professor of Molecular Biology/Biochemistry at University of California, Berkeley. The Ames test is done by exposing bacteria to the substance in question. In recent years Dr. Ames has written that using bacteria to establish carcinogenicity for humans is not accurate enough.

In addition I would submit that herbs in formulas may have a certain toxicity modified or neutralized. Restricting single herbs from testing on bacteria for carcinogenicity may thus be completely unwarranted. Once restricted, it is unlikely that research will be done to reinstate any herb.

I sincerely hope that ABC can begin to collaborate with Chinese and Ayurvedic sources. We students of Oriental and Ayurvedic medicine have extremely convincing, personal experience using these formulas and theories of medicine. Please do not contribute to the xenophobic or at least arrogant attitudes Western medicine and science have held for too long.

Claudia Johnson-Benvengu, Ph. D.
San Francisco, California

Ed. note — We appreciate Dr. Johnson-Benvengu's passion for herbal medicine, especially as herbs are employed in ancient traditions of Ayurveda and Chinese medicine. Unfortunately, she is erroneously assertive of ABC & HRF's position on herbs based solely on the content of HerbalGram *#30, our special issue on European phytomedicines. Hopefully, after reading this current issue on Traditional Medicines, she will understand that we have a high degree of respect for virtually all forms of traditional healing systems, especially those aspects that are continually being confirmed by modern scientific methods.*



Moving?

Our mail permit does not allow us to forward HerbalGram. If you move or change your mailing address, please notify us immediately so you will not miss any copies. Send your change of address notice to Margaret Wright, Circulation Manager, American Botanical Council, P. O. Box 201660, Austin, TX 78720. 512/331-8868. FAX 512/331-1924.

ACCESS

In this department of *HerbalGram*, we list resources such as publications, organizations, seminars, and networking for our readers. A listing in this section does not constitute any endorsement or approval by *HerbalGram*, ABC, HRF, or the HRF Professional Advisory Board.

Academy of Oriental Medicine - Formerly Texas Acupuncture Institute. A 2,400 hr., 3-yr. professional training in acupuncture, body work, and herbology. Dallas campus opening soon. Director Stuart Watts. Write for free catalog, or $5 catalog: 4105 S. First St., Austin, TX 78745. 800/824-9987 or 512/444-6744.

Audio cassettes. "Southwest Herbalism, A Growing Tradition." The 4th Annual Symposium, August 27-30, 1993, sponsored by the American Herbalist Guild. Complete con-ference on 24 tapes for $175 or $9 each from Tree Farm Cassettes, 23703 N.E. 4th St, Redmond, WA 98053, 800/468-0464, FAX 206/868-2495.

Biotechnology For Aridland Plants. Proceedings from the international symposium, Applications & Prospects of Biotechnology for Arid & Semi-Arid Lands, in Lubbock, TX, Nov. 5-7, 1992. Includes 25 chapters written by experts from eight countries, with topics that range from physiological adaptations and genetic analysis to the marketing of alternative crops. $30 from Biotechnology Conferences, c/o Dr. Tom J. Mabry, Dept. of Botany, University of Texas at Austin, Austin, TX 78713, 512/471-1900, FAX 512/471-3878.

Directory of Herbal Education. Compiled by Laura Z. Clavio. A listing of on-site and correspondence courses about herbs and herbal medicine across the U.S. and Canada. More than 55 offerings on Ayurvedic wilderness survival, Oriental medicine, and shamanism. Also includes academic institutions that offer graduate and undergraduate ethnobotanical studies. Order from Intra-American Specialties, 3014 N 400 W, West Lafayette IN 47906-5231, $6.95 ppd. Indiana residents add 5% sales tax.

The European Journal of Herbal Medicine. Subjects relevant to the practice of herbal medicine across Europe including scientific, professional, and political issues of importance. Published three times a year. Contact The National Institute of Medical Herbalists, 9 Palace Gate, Exeter, Devon, EX1 1JA, UK.

Formula ProKno Software for Chinese Herbal Medicine. For practitioners in clinics, schools, researchers, teachers and students. An intelligent electronic Formulary designed by an herbalist. Easy and integrated access from Western and Chinese perspectives to appropriate symptom, sign, medical theory, condition and action energetics, herb combinations: any information about herbal formulas. Over 150 classic Chinese sources, the entire Bensky Formulas and Strategies text included. Windows 3.1 point-and-click graphic environment, 15 megabytes. Contact Michael Gandy, L.Ac., East-West Healing Arts Center, ProKno Project, 2109 MacArthur Blvd., Oakland, CA, 94602. 510/531-4325.

Natural Product Letters. All aspects of research in the chemistry, biochemistry, and pharmacology of naturally occurring compounds and their analogues, from terrestrial and marine sources, including plants, microbes, and animals. $67 for four issues per volume. Order from STBS, P.O. Box 786, Cooper Station, NY 10276. Ph: 212/206-8900. Write for information on foreign subscriptions.

Pharmacopoeia of the People's Republic of China (English Edition, 1992). National code of standards for the quality of drugs in China. A single compendium of 1,751 monographs divided into three parts: Part I -Chinese Materia Medica, Oil, Fats, etc., Part II-Traditional Chinese Patent Medicines and Simple Preparations; and Part III-Chemical Drug Substances, Biological Substances, Antibiotics, and Their Preparations. Order from Beijing Huayi Biotechnology Co., Ltd., No. 2 Tian Tan Xi Li, Temple of Heaven, Beijing 100050, P.R. China. $260 plus $30 airmail.

Protocol Journal of Botanical Medicine. New quarterly publication with a holistic perspective to current medical research and practices. Combines Western allopathic practices with naturopathic, Ayurvedic, and Chinese practices to the same rigorous standards as other medical journals. Richard Scalzo, President of Gaia Herbs, Inc., will act as the research coordinator. $36/yr. for four issues; outside U.S. $45/yr. For more information contact Acacia Journal services, P.O. Box 3388, Durango, CO 81302-3388. 800/578-5904.

Video Tape. "A Walk in the Rain Forest with Dr. Jim Duke." An introduction to the sustainable use of rain forest plants. The program is about extractivism, the renewable harvesting of economically useful products from natural ecosystems, and its potential for saving the rain forest. Dr. Duke introduces the viewer to the use of the rain forest for food, medicine, and other products. $24.95 + $3.75 (S&H). North Carolina residents add 6% tax. Contact Environmental Media, P. O. Box 1016, Chapel Hill, NC 27514. 800/368-3382.

Video Tape. "Herbs and Flowers of the Inland Northwest." Shows many species with ornamental, edible, and/or medicinal utility. $21.95 ppd. from Wendy's Herbs, 3702 W. Rutter Pkwy, Spokane, WA 99218. 509/466-5089.

Vital Communications Natural Medicine Update, a monthly newsletter. Edited by Michael T. Murray, N.D., full of practical health information, and intended to inform the reader on recent medi-cal and nutritional research. Subscription: $49.95 for 15 issues or $89.95 for 30 issues. Information from Vital Communications, 15401 S.E. 54th Court, Bellevue, WA 98006. 800/488-0753.

Washington Drug Letter and Drug GMP Report. The latest information on FDA regulation changes, FDA enforcement actions, and industry reactions. *WDL* contains weekly updates on FDA and industry since 1969. Drug GMP Report, monthly since 1992, provides technical details and interpretations of GMPs. *WDL* (51 issues) for $667 in North America, elsewhere add $75. Drug GMP Report (12 issues) for $397 in North America, elsewhere add $25. Washington Business Information, Inc., 1117 N. 19th St., Ste. 200, Arlington, VA 22209. 800/426-0416.

CALENDAR

May 28-30, 1994—Gaia Herb Symposium. Sponsored in cooperation with American Association of Naturopathic Physicians (AANP) and designed for health professionals, herbal educators, and anyone interested in the curative potential of medicinal plants. Resort at the Mountain in Welches, OR. Three-day symposium is $195. Contact Gaia Symposium, 12 Lancaster County Road, Harvard, MA 01451, 800/252-0688 or 800/831-7780.

June 10-12 —2nd Internat'l Herb Symposium. Traditional and Modern Uses of Herbal Medicine. National and international teachers sharing herbal knowledge, experience, and traditional and modern approaches to herbal medicine. Formal instruction, herb walks, demonstrations, and hands-on interaction with herbs and the earth. Cost is $195, early registration, $175 before 4/15/93. Contact 2nd International Herb Symposium, P.O. Box 420, E. Barre, VT 05649. 802/479-9825.

June 14-19 — Society for Conservation Biology and the Assoc'n for Tropical Biology will hold their first joint meeting at the University of Guadalajara in Guadalajara, Jalisco, Mexico. The objectives are to promote biological research and conservation in the Neotropics. Contact Eduardo Santana or Stanley Temple, SCB-ATB Organizing Committee, Dept. of Wildlife Ecology, University of Wisconsin, Madison, WI 53706, Fax 608/262-6099; or Bruce Benz, Laboratorio Natural Las Joyas, Universidad de Guadalajara, APDO Postal 1-3933, Guadalajara, Jalisco, C. P. 44100, Mexico, Fax 52-338-7-27-49.

June 20-26 — 35th Annual Meeting of the Society for Economic Botany, sponsored by Jardin Botanica, Instituto de Biologia and the Universidad Nacional Autonoma de Mexico (UNAM). The dates of the meeting are designed to help people attend both the Joint Meetings of Tropical Botany and Conservation

Continued next page

CALENDAR CONT'D

Biology. Field trips to various ecological regions. Contact Lucille Kaplan, Secretary SED, Dept. of Anthropology, University of Massachusetts, 100 Morrissey Blvd., Boston, MA 02125-3393. Phone 617/287-6850. FAX 627/287-6650.

June 25 — 4th Annual Ginseng Day Sponsored by the New York State Ginseng Association. Ginseng workshops, special guest speaker, Mr. W. Scott Persons. Contact the New York State Ginseng Ass'n., Box 127, Roxbury, NY 12474. 607/326-3005.

June/July — 3rd Congress of the Internat'l Society for Ethnopharmacology, Beijing, China. Contact: Prof. Xiao Pei-Gen, Dir. of IMPLAD, Haidan District, Dong Beiwant, Beijing 100094, China.

July 4-9 — 48th International Congress of Americanists, "Threatened Peoples and Environments in the Americas," Stockholm, Sweden. Contact Institute of Latin American Studies, n5-106 91 Stockholm, Sweden (011-55-46/816/2877).

July 7-10, 1994 — Internat'l Herb Growers and Marketers Association Conference, Raleigh, N. Carolina. Contact IHGMA, 1202 Allanson Rd., Mundelein, IL 60060, 708/949-4372.

July 17-22— Internat'l Ginseng Conference, Vancouver, B.C. "The Challenges of the 21st Century." Includes three major components: three days of conference sessions and presentations, a trade show, and tours of the ginseng production region of British Columbia. Contact Dr. W. G. Bailey, Conference Chair-IGC '94, Dept. of Geography, Simon Fraser University, Burnaby, British Columbia, Canada V5A 1S6. 604/291-3321, Fax 604/291-5841.

July 31-August 4, 1994 — International Congress on Natural Products Research (35th ASP Annual Meeting), Nova Scotia, Canada. A joint meeting with the Gesellschaft fur Arzneipflanzenforschung, the Association Francaise pour l'Enseignement et la Recherche en Pharmacognosie, and the Phytochemical Society of Europe. Contact Dr. Frank Chandler, College of Pharmacy, Dalhousie University, Halifax, N.S., Canada, B3H 3J5, 902/494-2097, Fax 902/494-1396.

August 7-12 —Herb, Spice, and Medicinal Plant Workshop. Production and utilization of herbs, spices, and medicinal plants with a focus on Northwest Pacific and the Caribbean. Sponsored by the American Society for Horticultural Science Meetings. Contact Manuel C. Palada, RR 2, Box 10,000, Kingshill, St. Croix, USVI 00850. 809/778-0050. FAX 809/778-6570.

August 13-19 — Natural Health, Natural Medicine with Dr. Andrew Weil. Workshop exploring the most effective and practical alternatives to high-tech, disease-oriented medicine. Explore nutrition, exercise, stress reduction, herbs, vitamins, breathing techniques and the deeper process of reconnecting with nature, community, and the higher self. Cost $899 includes instruction, meals, and lodging. Contact: Feathered Pipe Foundation, P O. Box 1682, Helena, MT 59624. 406/442-8196. FAX 406/442-8110.

August 15-19 —Phytochemistry of Medicinal Plants. Sponsored by the Phytochemical Society of North America. Lectures on the conference theme and contributed papers and posters on all aspects of phytochemistry. For more information, contact J. T. Arnason, Fax 613/564-9295, X. Lozoya, Fax 525/761-0952, R. Mata, Fax 525/622-5329.

August 18-21 — 8th Internat'l Conference on Traditional Medicine and Folklore. St. John's, Newfoundland. Sponsored by the Mexican Academy of Traditional Medicine and Memorial University of Newfoundland. Contact J. K. Crellin, Faculty of Medicine, Memorial University of Newfoundland, St. John's, NF A1B 3V6.

August 19-21, 1994 — Wildwoman Wilderness Retreat. Rediscover your Green Spirit on a professionally guided hike into the beautiful Selway-Bitterroot Mountains of western Montana. With llamas to carry provisions, study medicinal and edible plants. Included are three vegetarian meals a day. $185 per person (women only). Contact Alla-mans' Montana Adventures, Dept. HG, West Fork Route, Darby, MT 59829 (SASE), 406/821-3763.

August 26-29, 1994 — The American Herbalists Guild 5th Annual Symposium, "Contributions of Herbalism in American Health Care," at the Buffalo Gap Camp for the Cultural Arts near Capon Bridge, West Virginia. Contact AHG Conference, c/o Joe Pye & Friends, P.O. Box 5022, Springfield, VA 22150-5022, 703/644-5627.

August 28-September 3, 1994 — Measuring and Monitoring Biodiversity in Tropical and Temperate Forests, Chiang Mai, Thailand. Contact Secretariat, Forest Biodiversity Symposium, Royal Forest Dept., Silvicultural Research Subdivision, 61 Paholyothin Rd., Chatuchak, Bangkok, Thailand 10900, Fax: 66-2-5794730 or 819/997-8697.

September 5-7 — 25th International Symposium on Essential Oils, Grasse, France. Contact: Association des Ingenieurs et Techniques de la Parfumerie (AITP), 48 Avenue Riou-Blanquet, 06130 Grasse, France.

September 12-15, 1994 —Association of Official Analytical Chemists International, 108th Annual Meeting, Half Day Symposium on Analytical Methods for Herbal Products in Seattle, WA. Contact AOAC, 703/522-3032, Fax 703/522-5468.

September 19-20, 1994 —International Business Communications Conference on Medicinal Plants: Current Opporunities for Rx & Biotech Industry, Contact International Business Communications, 225 Turnpike Road, Southborough, MA 01772-1749, 508/481-6400

October 22-29 —Ethnobotanical Tour of the Amazon Rainforest sponsored by the American Botanical Council and the Texas Pharmaceutical Foundation. Accredited workshops and field experiences will focus on the role this prolific ecosystem plays in healthcare worldwide. Some workshops will provide continuing education credits for pharmacists. Other health care professionals and individuals are welcome. Workshop leaders represent some of the world's foremost "pharmaceutical prospectors" and experts in the fields of phytomedicine, pharmacognosy, and ethnobotanical and ethnobiomedical research. $1,898 from Miami. Contact Penny King, ABC, P. O. Box 201660, Austin, TX 78720. 512/331-8868, Fax 512/331-1924.

CLASSIFIED

A listing in this classified section does not constitute any endorsement or approval by *HerbalGram*, the American Botanical Council, the Herb Research Foundation or the HRF Professional Advisory Board. *HerbalGram* Classified ad rates: $1.25 per word; $35 minimum. Contact Margaret Wright, P.O. Box 201660, Austin, TX 78720. 512-331-8868, FAX 512-331-1924.

BOOKS AND TAPES

Chinese Herbal Medicine — Professionally made video tapes for convenient at-home study of Chinese herbs. First three tapes (total time: 200 minutes) just $45, including shipping. Institute for Traditional Medicine, 2017 S. E. Hawthorne, Portland, OR 97214. New tapes available each month.

COURSES, CORRESPONDENCE COURSES AND SEMINARS

Chinese Herbology Home Study Course — Our highly effective correspondence course uses audio cassettes and integrated notes from our Residence Program classes, plus herbal samples. Leads to herbalist certification. Send for free brochure, Institute of Chinese Herbology, 3871 Piedmont Ave., #363, Oakland, CA 94611. 510/428-2065.

Green Nations Gathering — September 23-25, 1994. Long weekend includes workshops by leading herbalists and Native Americans; earth health ceremony; sweat lodges, music, and more. Pam Montgomery, Box 266-HG, Milton, NY 12547. 914/795-5238.

Green Terrestrial offers herbal and earth awareness workshops, wise woman apprenticeships and more. Pam Montgomery, P. O. Box 266-HG, Milton, NY 12547. 914/795-5238.

Healing with Herbs Three-day Introductory Seminar. June 3, 4 & 5, 1994. Herb walks, growing and harvesting herbs, remedy making, help for common ailments, holistic herbal therapies and more! With Chanchal Cabrera M.N.I.M.N. and Robert Wooding, C. H. Held on a beautiful 150-acre organic herb farm in Virginia. For information contact Southern Virginia Herbals, Rte. 3, Box 81, Halifax, VA 24558. 804/476-1339.

Herbal Healer Academy — Economical home study herbology and natural medicine courses—fun and informative. Free brochure. Call Marijah McCain, M. H. 501-269-4177.

CLASSIFIED CONT'D

Herbal Studies Curriculum, *Integral Health Studies Cerificate*–An exciting new option for people seeking reliable herbal education. Courses taught by **David Hoffman, Terrence McKenna, Kathi Keville, and Leslie Tierra**. This unique graduate program explores the ecological, multi-cultural and holistic field of herbalism. The Herbal Studies Curriculum provides an integrated framework for: Outreach to health care professionals seeking knowledge on the use of herbal medicines within a western medical practice; Meeting the special needs of the herbal industry with courses focusing on the manufacture and retailing of herbal products. Designed to enhance the professional's understanding of modern herbalism, the Certificate confers a statement of added qualifications. August 1st is the application deadline for the Fall of 1994. For more information, please call: California Institute of Integral Studies, 765 Ashbury Street, San Francisco, CA 94117, 415/753-6100 ext 459.

Homeopathic Courses — Introductory and Professional levels. Doctors and non-doctors. Classroom and correspondence. The International Academy of Homeopathy, 3255 Yonge St., Toronto, ON M4N 2L5. 416/481-8816.

Natural Healing Home Study — Australasian College of Herbal Studies offers dynamic, written, audio & video course materials. Diploma & Certifi-cate curriculum. Free Prospectus. 800/48-STUDY.

Practical Herbalism Six-day Advanced Level Seminar, August 19-24, 1994. $650.00. Biochemistry of herbs, organic gardening, practical medicine making, herb projects, herb walks & wildcrafting skills, materia medica, kitchen cupboard first aid, problem solving and treatment plans, wild food harvesting, herbal slide show. With Chanchal Cabrera M.N.I.M.N. and Robert Wooding, C. H. Held on a beautiful 150-acre organic herb farm in Virginia. For information contact Southern Virginia Herbals, Rte. 3, Box 81, Halifax, VA 24558. 804/476-1339.

Rain Forest Ecotour to Amazon (Peru) — Study medicinal plants with Dr. Jim Duke, Jan. 21-28, 1995. $1,850.00 inclusive from Miami. Details: Susanna Reppert, The Rosemary House, 120HG S. Market, Mechanicsburg, PA 17055. 717/697-5111.

Rocky Mountain Center for Botanical Studies — Comprehensive herbal curriculum, one year certification program. Call 303/442-6861 or send $1.00 for catalogue to P. O. Box 19524, Boulder, CO 80308-2254. Classes start February 1995.

Second International Herb Symposium; Traditional and Modern Uses of Herbal Medicine, a Global Perspective — Sponsored by Frontier Cooperative, Zand, Herb Pharm, & Sage, this outstanding symposium is being held June 10-12, 1994, at Wheaton College (35 minutes from Boston). Renowned herbalists from around the world will be speaking on the medicinal uses of plants. Workshops are geared towards all levels of herbal interest and include demonstrations, lectures, and herb walks for beginner through advanced students. Nationally-known herbalists include: David Hoffman, Susun Weed, Christopher Hobbs, Rosemary Gladstar, Cascade Anderson Geller, Michael and Lesley Tierra, Dr. James Duke, David Winston, Ed Smith, Janet Zand, and special guest Thomas Moore, author of Care of the Soul. Speakers from Germany, Portugal, Greece, England, South America, Canada, and Australia will be represented. Lodging and meals are provided on campus. For further information write to: Second International Symposium, P. O. Box 420, East Barre, VT 05649. 802/479-9825.

Therapeutic Herbalism — A correspondence course for professional health-care practitioners and students of holistic medicine, offering training in a clinically oriented approach to Phytotherapy. Written by David Hoffman. For detailed prospectus: 9304 Springhill School Rd., Sebastopol, CA 95472.

PUBLICATIONS

American Herb Association Quarterly Newsletter — $20/yr. AHA, P.O. Box 1673, Nevada City, CA 95959.

Australian Journal of Medical Herbalism — quarterly publication of the National Herbalists Association of Australia (founded in 1920). Deals with all aspects of Medical Herbalism, including latest medicinal plant research findings. Regular features include Australian medicinal plants, conferences, conference reports, book reviews, rare books, case study and medicinal plant review. Aus/$40 plus Aus/$15 if required by airmail. National Herbalists Association of Australia, P. O. Box 65, Kingsgrove, NSW, 2208, Australia.

The Bu$iness of Herbs — Comprehensive reporting, business news, marketing hints, sources, and resources. Subscription $20/yr. Brochure/SASE from Northwind Farm, Rt. 2, Box 246(G), Shevlin, MN 56676.

Directory of Herbal Education — Listing over 50 sources of on-site and correspondence courses with details on content and cost. Forty-eight page booklet. $6.95 postpaid. Intra-American Speialties, 3014 N. 400 W., West Lafayette, IN 47906.

Foster's Botanical and Herb Reviews — Information resources, book reviews, new periodicals, etc. Quarterly. $10/yr from Steven Foster, P.O. Box 106, Eureka Springs, AR 72632. 501/253-7309. FAX 501/253-7442.

Grow Gourmet & Medicinal Mushrooms — We offer intensive seminars on the cultivation of medi-cinal mushrooms. For our free brochure, please con-tact: Fungi Perfecti, P.O. Box 7634HG, Olympia, WA 98507. Ph: 206/426-9292. Fax 206/426-9377.

HerbalGram — Quarterly journal published by the American Botanical Council and the Herb Research Foundation. $25/yr, $45/2 yrs, $60/3 yrs. P.O. Box 201660, Austin, TX 78720. See page 71.

The Herb Growing and Marketing Network — An information service for herb businesses and serious hobbyists. Includes The Herbal Connection, a 36-page bimonthly trade journal, The Herbal Green Pages, annual resource guide with over 3,000 listings, free classified advertising for subscribers, and more. Entire package $45/yr. Sample newsletter, $4. The Herbal Connection, P. O. Box 245, Silver Spring, PA 17575; 717/393-3295.

Herban Lifestyles — Bimonthly newsletter with entertaining, eclectic, and sometimes esoteric reports on how we live, work, and play with herbs. Money-back guarantee. Sample $3. $18/yr. Free brochure. Stone Acre Press, 84 Carpenter Rd., Apt. 78711-1, New Hartford, CT 06057.

The Herb Quarterly — When the world wearies and ceases to satisfy, there's always The Herb Quarterly, a beautiful magazine dedicated to all things herbal—gardening, medicinals, crafts, folklore, alternative uses of herbs, and more. Rates: $24/1 yr, $45/2 yrs, $60/3 yrs. P.O. Box 689, San Anselmo, CA 94960.

International Journal of Aromatherapy — Edited by aromatherapy author Robert Tisserand. Articles and information on uses of essential oils in well-being. Designed for practitioners, teachers, suppliers, writers, etc. $22/yr. Aromatherapy Publications, 3 Shirely St., E. Sussex, BN3 3WJ England.

Medical Herbalism — Subtitled "A Clinical Newsletter for the Herbal Practitioner." Edited by Paul Bergner. $24/yr, $42/2 yrs. Canada: $29/yr. Over-seas: $39/yr. Sample/$4. *Medical Herbalism*, P. O. Box 33080, Portland, OR 97233.

Nature's Field — Contemporary journal of herbal and natural healing. Published six times a year. $18/yr, $3/sample, free catalog. P. O. Box 425, Springville, UT 84663. 801/465-4254.

Washington Insight - A quarterly newsletter designed to keep natural products scientists abreast of funding opportunities and other important happenings in Washington, D.C., that may affect them and their institution, including interviews with congressmen, senators, and other government officials. In addition to the newsletter, subscribers receive Funding Alert, which provides pre-advertised information on funding opportunities, and Compound Alert, listing of compounds of interest to the National Cancer Institute which need research to insure adequate supplies—another opportunity for research grants. Annual subscription, U.S. personal/$40; institutional/$85. Foreign personal/$50; institutional/$90. Contact *Washington Insight*, 11000 Waycroft Way, North Bethesda, MD 20852. 301/881-6720; FAX 301/984-7372.

Wildflower — North America's only popular magazine devoted solely to the study, conservation, and cultivation of our continent's native flora. Offering an appealing blend of art and science, this 48-page quarterly examines all aspects of popular botany in North America from the rain forests of Panama to the micro-mosses of the Arctic tundra; from gardening with native trees, shrubs, wildflowers, and ferns to the latest projects in habitat and native plant conservation. The green revolution begins in our own backyard. Wildflower is published by the Canadian Wildflower Society, 90 Wolfrey Ave., Toronto, Ontario, Canada M4K 1K8. Tel. 416-466-6428. Subscriptions and membership are $25/yr., $45/2 yrs. Sample copy $5.

OTHER

Comprehensive Herbal Software - Use the "state of the art" tool for herbal information. GLOBALHERB is the world's largest library of herbal information for your personal computer. GLOBALHERB contains 1,000 herbs, herbal formulas, and nutrients. Instant cross-referencing by condition, property, body system, and/or constituent. Available for IBM and Macintosh. Smaller programs also available. Contact Steve Blake, 408-335-9011. 5831 Highway 9, Felton, CA 95018 USA. So simple it's advanced.

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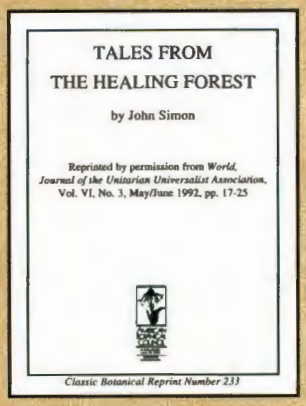

Classics I, II & III

A complete set of all Classics published by ABC.

Only $85.00

Item #240

Add $2.50 US/$5 Canada/$15 foreign for postage & handling.

For complete listing of Classics Vol. I, and II, see pages 50 and 51.
For Vol. III see page 45.

The Farnsworth Symposium

"Progress on Terrestrial and Marine Natural Products of Medicinal and Biological Interest," in honor of the 60th birthday of Professor Norman R. Farnsworth. The 181-page published proceedings include 19 scientific papers, 10 abstracts, and 11 abstracts.

$29.00

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by Steven Foster

The eight-page booklets in this series have beautiful color reproductions of each plant providing concise, authoritative and accurate information on major medicinal plants.

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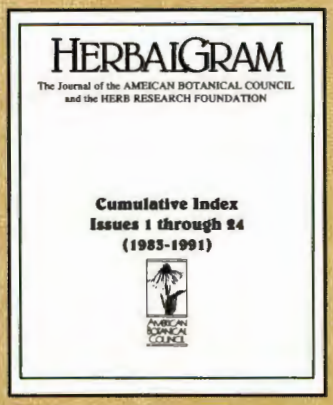

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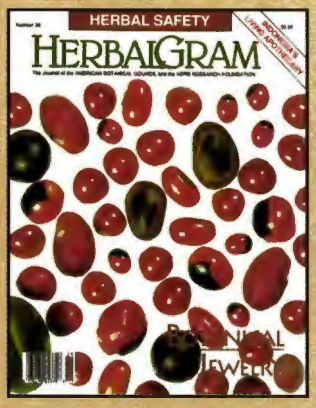

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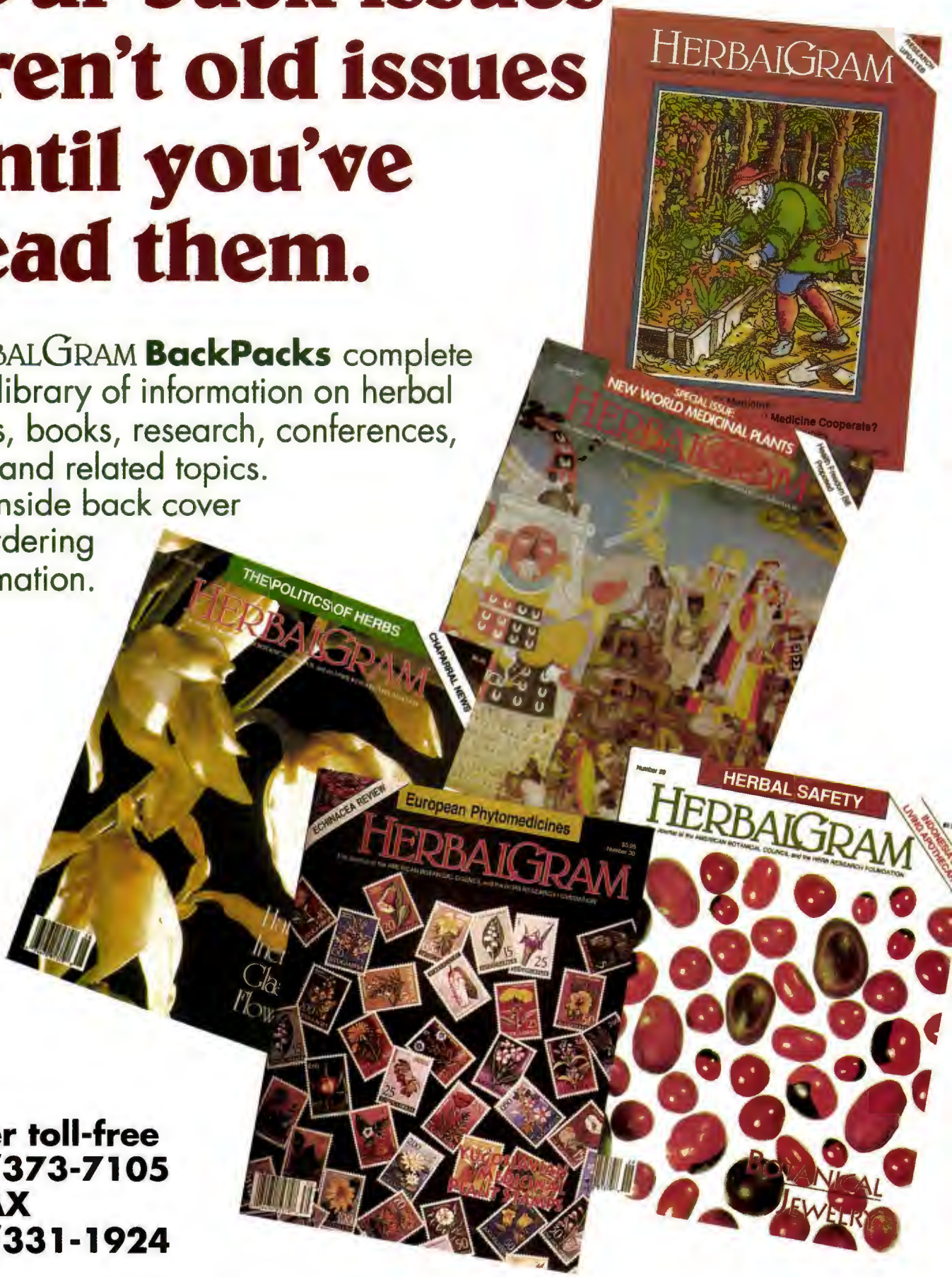

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