HERBALGRAM

Published by the AMERICAN BOTANICAL COUNCIL and the HERB RESEARCH FOUNDATION No. 18/19 Fall 1988/Winter 1989

FEATURE ARTICLE:

ST. JOHN'S WORT

Used for centuries in European folk medicine, this herb is being studied for its potential anti-retroviral activity. Page 24.

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HYPE OR HOPE?
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The Hoxsey Film

A new documentary asks: "Did the Hoxsey cancer cure really work?" Plus, Dr. Jim Duke's review of this herbal formula. Page 11.

MARKET REPORT, MEDIA WATCH, BOOK REVIEWS, HERB BLURBS, POTPOURRI, CONFERENCE REPORTS, AND MORE...

SPECIAL DOUBLE ISSUE

St. John's Wort
Hypericum perforatum,
from *The Natural History of Plants*,
H. Baillon, 1880

ABOUT THIS ISSUE

Regular readers of *HerbalGram* will immediately note that with this issue we have significantly changed our format. Not only are we adding color to the cover and inside pages, but our entire layout has been improved, with more botanical illustrations and other graphic changes, increasing the overall readability, and, hopefully, interest.

The format changes are a result of the efforts of our new art director, Ira Kennedy, who brings over 25 years experience in art, photography, illustration, layout, and editorial experience with him. The addition of Kennedy to the *HerbalGram* staff is a result of a deeper more significant change, the formation of a new organization, the American Botanical Council (ABC). (See story on page 4.)

Due to organizational requirements inherent in setting up a new non-profit corporation, and because of the holidays, we are printing a *double issue* of *HerbalGram*. This issue represents both Fall 88 and Winter 89 editions (numbers 18 and 19). Subscribers please note that, with respect to subscriptions, we consider this one issue. In effect, with this double issue, our subscribers and HRF members are receiving an extra bonus issue.

Addition to the HRF Advisory Board

We would like to offer a hearty welcome to Andrew Weil, M.D., a new member of the HRF Advisory Board. Dr. Weil is a noted author and lecturer in the areas of medicinal plants and botanical drugs. He is a graduate of Harvard University where he studied under the eminent Professor Richard E. Schultes, acknowledgedly one of the leading experts on the subject of medicinal plants in the world. Dr. Weil is author of numerous books and currently teaches at the University of Arizona School of Medicine. He lives in Tucson where he also has a clinical practice. You will find a review of his recent book *Health and Healing* on page 37.

A Quick Look at This Issue

Once again we are publishing a major literature review by Christopher Hobbs, a third generation botanist and herbal author who lives in Santa Cruz, Cal. This time it is St. John's Wort, which we consider an important botanical. Hobbs wrote the excellent review of Sarsaparilla in our last issue. This has been reprinted in an eight-page monograph form by ABC as part of its reprint project. (There will be more information on reprints at a later date.)

We chose St. John's Wort because of the recent flurry of interest that followed a report by the National Academy of Sciences indicating possible anti-retroviral activity for some of the chemical components of this plant. As Hobbs points out, St. John's Wort has been used extensively in European herbal medicine. It is considered a boon by many herbalists, a noxious weed by others, a potential toxin to livestock, and formerly an (incorrectly classed) unsafe herb to the FDA.

Our Technical Editor, Rob McCaleb, gives additional information on the recent St. John's Wort study in his "Research Reviews" on page 18.

Readers are cautioned not to confuse Hobbs's article on St. John's Wort (*Hypericum*) with Steven Foster's essay on *Huperzia*, a Chinese medicinal plant whose alkaloids have recently been shown to have some potential benefit for Alzheimer's patients. We include a brief note from Dr. Alan Kozikowski, the primary U.S. researcher on the chemistry of *Huperzia* alkaloids.

On the more controversial side, we have devoted some space to report on the recently released documentary film on Harry Hoxsey,whose herbal formula received wide notoriety as a reputed cancer cure. Hoxsey was continually at odds with both the AMA and the FDA and was eventually forced to close his 17 cancer clinics. Without making a case for or against Hoxsey, we offer a report on Santa Fe filmmaker Ken Ausubel's compelling documentary. Contributing Editor Jim Duke presents a brief essay on the antitumor potential of some of the compounds found in the Hoxsey herbs.

We briefly profile Sir James Black, one of the three recent winners of the Nobel Prize for medicine, who has had a remarkable career in pharmaceutical drug development. Of interest to our readers is the fact that Sir James is one of the leading researchers and proponents of the therapeutic values of Evening Primrose Oil.

Finally, Professor Ara Der Marderosian gives us a summary of the 5th International Ginseng Symposium held concurrently with the Olympic games in Seoul last fall. The research on this fabled herb continues in Asia and Europe, but not in the United States and Canada. Ironically, the only remaining segments of the world's wild population are still commercially viable for harvest.

We hope you will find much benefit in this expanded issue of *HerbalGram* and invite you to let us know your opinions on our content and our new format.

NEW ADDRESS

We ask our readers to note that ABC and *HerbalGram* now share a new address and phone number: P.O. Box 201660, Austin, Texas, USA 78720. Phone 512/331-8868. FAX 512/331-1924.

Our mail permit does not allow *HerbalGram* to be forwarded. If you move or change your mailing address, please notify us immediately so you will not miss any copies.

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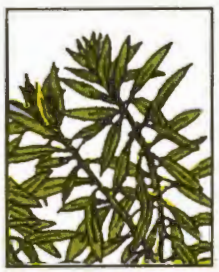

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American Botanical Council Formed in November '88

The American Botanical Council (ABC), incorporated in November, 1988, as a non-profit educational organization, is now the publisher of *HerbalGram*. The priority of mandates for ABC is to enhance editorial and graphic aspects of *HerbalGram*, then raise funds necessary to circulate it more widely to members of the medical, pharmacy, nursing, research, botany, journalism, natural food, and herb communities.

In addition to *HerbalGram*, ABC is developing numerous short, non-technical monographs on the 24 most popular herbs. ABC is also reviewing for reprint various articles and treatises dealing with the subjects of medicinal plants, ethnopharmacology, pharmacognosy, and related topics previously published in technical and scientific journals. ABC will make these reprints available to the general public, press, and scientific and medical communities as part of its educational program. The objective of this program is to increase general awareness about the effectiveness and appropriateness of medicinal plants in public health care.

HerbalGram is still published in association with the Herb Research Foundation and available to all HRF members. The HRF will continue to offer the same invaluable editorial and peer review functions as in the past: each issue of *HerbalGram* is sent to every member of the HRF Professional Advisory Board prior to publication for fact checking by some of the nation's leading medicinal plant research scientists and authors.

With the inception of ABC, *HerbalGram* will no longer be published for the American Herbal Products Association (AHPA - the trade association of major herb manufacturers and distributors). For the past five years, AHPA has provided partial financial support for publication of *HerbalGram*. The AHPA Board has indicated its intention to provide an educational grant to ABC for continued development of this publication. For this support we are most grateful. ❐

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.*

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 Shirley St., Hove, E. Sussex, BN3 3WJ England.

Homeopathic Research Reports: Published by the Foundation for Homeopathic Education and Research. Recent research and articles on homeopathic medical topics. Tax-deductible donation of $25 or more. 5916 Chabot Crest, Oakland, CA 94618. 415/ 420-8791.

The Ozarks Herbalist: Quarterly newsletter about growing and using herbs. Folklore, book reviews, plant and seed sources, calendar, recipes, etc. 28-30 pps. $10/yr; $14/Canadian and overseas. Sample/$2.75. Route 4, Box 730, Oak Grove, AR 72660.

The Ayurvedic Course; A Home-Study Program: Offered by the Institute for Wholistic Education to teach the fundamental principles of Ayurveda. Three part course includes anatomy, physiology, ayurvedic thought, yogic philosophy, constitutional analysis, diagnostic methods, diet, herbs, etc. Written and developed by David Frawley, co-author of *The Yoga of Herbs*. Entire course $225; first section only, $100. Institute for Wholistic Education, 33719 116th St., Twin Lakes, WI 53181.

Renewable Resources Journal: 32-page publication of the Renewable Natural Resources Foundation. Topics include preservation of biodiversity, rain forests, environmental legal developments, etc. Individual subscription $16; institutional/corporate $32, from RNRF Subscriptions, 5430 Grosvenor Ln., Bethesda, MD 20814.

LETTERS

Sarsaparilla Feedback

I was interested to read the Editor's note on page 2 of *HerbalGram* (No. 17, Summer 88) concerning the absence of testosterone in the Sarsaparilla plant. Recently I was researching for an article on sarsaparilla (*Smilax* spp.) and came across several references indicating that testosterone was present in sarsaparilla. These references were:

- Dr. Raymond Stark ND, *The Book of Aphrodisiacs*, 1981 (Stein and Day) (p. 81).
- Richard Lucas, *Nature's Medicines*, 1968 (Wiltshire Book Co.) (p. 56)
- *Dorothy Hall's Herbal Medicine*, 1988 (Lothian) (p. 271)

I consulted a number of other books on herbs, herbal remedies, and medical botany, but have been unable to find any references at all to sarsaparilla containing sex hormones, in fact, such references are very conspicuous by their absence.

I am writing to inquire if you have seen the above statements and if, perhaps, you could shed a little light on the information contained therein.

Unfortunately, there seems to be so much contradictory information available on herbs nowadays, and so often it is the inaccurate information which gets passed on. *HerbalGram* is providing a wonderful source of up-to-date knowledge and I look forward to receiving each issue.

Kim Fletcher
Tasmania, Australia

(The references listed are not considered to be authoritative sources from a scientific point of view. This letter points out a general problem with some of the herb literature currently available. It is precisely because there is so much contradictory and inaccurate information about Sarsaparilla that we printed Christopher Hobbs's excellent review of the literature on Smilax. — Ed.)

Rain Forest Redux

On behalf of myself and the National Herbalists's Association of Australia, I applaud your stance and attention to the Rain Forest issue — an issue I have 'fought' for many years, and (about) which I recently coproduced an article for our NHAA publication. Most Australian herbalists are too complacent over this issue, and don't make the connection between the therapeutic use of herbs and their origins in the natural environment.

Andrew Pengelly
Singleton, N.S.W., Australia

How Did Van Gogh?

Does Absinthe Make the Heart Grow Fonder?

Did the famous painter Vincent Van Gogh commit suicide because he was having fearful hallucinations related to his addiction to several substances containing toxic chemicals called terpenes?

That's what art and medical historian Dr. Wilfrid N. Arnold, a Kansas City, Kansas biochemist at the University of Kansas Medical Center writes in the *Journal of the American Medical Association* (Nov. 25, 88). Dr. Arnold has studied numerous accounts of Van Gogh's life (and death) and believes that the painter was addicted to absinthe, camphor, and turpentine—all of which contain toxic terpenes.

Van Gogh, self portrait

Terpenes are a class of chemicals usually found in essential oils, resins and other aromatic products of numerous plants, often of the pine and citrus families. One of the most common terpenes is pinene, a principle ingredient in oil of turpentine. Another is thujone, a principle ingredient in absinthe, the now-banned liqueur made from the Wormwood plant (*Artemisia absinthium*), which is also the flavoring source for the wine called Vermouth (actually wormwood in German).

Though not always toxic, some of these terpenes, when ingested in large amounts over a protracted period of time, can cause a host of undesirable conditions, including convulsions, insomnia, nausea, nightmare, restlessness, tremors and vertigo, among others. Researcher Arnold believes that Van Gogh had an unnatural craving for terpenes, and probably ingested much more than some of his contemporaries like Toulouse-Lautrec, Gauguin and Baudelaire who, like many French artists in the 1890s, were quite fond of the drink absinthe.

According to Arnold, Van Gogh knew he had an addiction problem, and may have committed suicide because he feared having recurrent seizures with hallucinations.

Can Wintergreen Light Up Your Smile?

Scientists have finally figured out what many kids have known for a long time: if you go into a dark room or closet and crunch down on a wintergreen-flavored Lifesaver, tiny blue-green sparks of light will be emitted from your mouth.

These tiny bolts of lightning are the subject of research by chemist Linda M. Sweeting of Towson State University in Baltimore. She knew that when sugar is crushed several charges of positive and negative form on the new surfaces. The polarity creates a situation where electrons leap across the gaps to neutralize the zone. When these electrons combine with nitrogen in the air, they emit a blue-white light on a wavelength equal to atmospheric lightning.

But researcher Sweeting revealed that candies containing both sugar and wintergreen emit an additional wavelength when crushed. Wintergreen is fluorescent, absorbing ultraviolet radiation and re-emitting it as a wavelength of visible light. When the mints are chewed, some of the wavelengths from the sugar are ultraviolet. These are absorbed by the wintergreen and then re-emitted as the bright blue-green light. (*Discover*, Dec. 88)

Wintergreen
Gaultheria procumbens,
Redrawn from *American Medical Plants*, Charles F. Millspaugh, 1892

What's In a Name?

Flax Facts

Flax seed has become popular recently as consumers begin to use flax oil in cooking. Flax seed (*Linum usitatissimum*) yields an edible oil high in Omega-3 fatty acids. These have been shown to have numerous beneficial properties. The historical use for flax has been for its oil (often called linseed oil) and for its fiber. In earlier days, gold colored flax straw was called tow, hence the term "towhead" for a child with light colored hair.

But there's more. Flax has added several other terms to the English language. The name linseed oil is derived from flax's Latin name *linum*. This oil has been used as a furniture polish in industrial applications. When the manufacturer of a new floor covering derived from solidified linseed oil (the Latin word for oil is *oleum*) named its new product, they naturally came up with the word *linoleum*.

In the British Isles, flax fiber was traditionally used to make a beautiful cloth "known for its strength, coolness and luster." Again deriving from the Latin *linum*, we call that cloth *linen*. Finally, the term, "linoleic," referring to the acid found in many vegetable oils, also derives its name from *linum*. (From Michael Gartner's syndicated column "About Words," Aug. 15, 88, plus additional material from the *HerbalGram* staff.).

Creosote bush
Larrea tridentata.
for *HerbalGram*,
Ira Kennedy, 1989

Tobacco Headed Down Primrose Path In Canada

What do you do when a plant like tobacco falls out of favor with increasingly health-conscious consumers? That is the question that many tobacco growers have been asking in southern Ontario where decreased demand for the crop has left farmers looking for alternative crops.

Ib Nonecke and John Baker, agronomists at the University of Guelph, think that they have found a reasonable replacement which is not only comparable in dollar value but also beneficial to human health as well. They are recommending that farmers plant Evening Primrose (*Oenothera biennis*) which is native to the area. The seeds yield an oil that is high in gamma-linolenic acid (GLA) which is an important component in building cell membranes. GLA has become increasingly recognized for its medical values. (See related article about Sir James Black on page 8.)

Part of the difficulty in keeping up with increasing demand for the seed oil, according to an article in *Garden* (Nov/Dec 88,) is the two-year cycle the plant needs to produce seeds—hence its Latin name *biennis*. The Guelph researchers claim that they have achieved high germination rates for the seeds by sprouting them under unusually bright greenhouse lights. When they are transplanted to fields, the plants are able to mature and bear seeds in only five months, almost one-fifth the time normally required!

Chaparral: One of Oldest Plants on Earth?

An interesting article in *Garden* (Nov/Dec 88) asks the question whether the creosote bush, or chaparral as it is known in the herb market (*Larrea tridentata*), might not be older than either the 2000 year-old redwoods or the 4600 year-old bristle cone pines. According to research by botanist Frank Vasek of the University of California at Riverside, some of these bushes may have origins that go back 11,000 years!

It's like this. The bushes grow in rings around an empty center which was once the site of the original organism which grew from a seed. That bush grew outward, sending out branches that developed roots of their own. Eventually, the original seedling dies. During a span of thousands of years, this process creates an area in the middle of bare soil encircled by a ring of genetically identical creosote bushes, all deriving from the same original seed. There has been no pollination from another plant where new genetic material would be mixed to form a new plant.

Researcher Vasek has found one ring of creosote bushes growing in the Mojave desert about 150 miles northeast of Los Angeles that he has dubbed "King Clone." The elliptical ring is 70 feet by 25 feet. Samples of the outer edges are 100 to 150 years old, while old-wood samples measured 540 years. By projecting the rate of growth from the center, Vasek figured that King Clone is about 11,700 years old. In 1985 the Nature Conservancy purchased the 17 acres of land around King Clone to preserve it from nearby development.

It is still not clear whether the chaparral qualifies as the oldest plant on earth. Researchers speculate that the box huckleberry (*Gaylussacia brachycera*) growing in western Pennsylvania might be 6000 to 13,000 years old. There may be other contenders as well. The cattails (*Typha* spp.) of the Nile spread roots along the river banks and spawn endless clones. Unfortunately, accurate measurement of their age is not possible.

Did You Read Your Morning Kenaf?

The USDA estimates that U.S. newspapers used more than 12 million metric tons of paper last year, two-thirds of which was imported at a cost of $4 billion. The department is now taking another look at kenaf (*Hibiscus cannabinus* L.), a Sunbelt-loving fibrous plant that grows from a seedling to as tall as 18 feet in less than five months. Kenaf was the leader among the more than 500 plants tested 30 years ago to determine a viable raw material for newsprint. The department has committed $600,000 to kenaf studies at laboratories in Okla. and Texas during the next two years, with the hope that the plant will become a new cash crop for farmers and a supplemental source of newsprint. (*Insight*, Oct. 24, 88)

This annual, nonwood fiber plant native of east-central Africa was introduced into the U.S. in the 1940s as a substitute for jute to produce cordage. Research and development work for pulp, paper, and other fiber products began in 1960 and continues today. Efforts to commercialize kenaf have passed through phases of public and private leadership according to Daniel E. Kugler of the USDA Cooperative State Research Service speaking at the New Crops Conference at Purdue University, October, 1988.

Epazote: An Herbal Cure for the Greenhouse Effect?
The Status of Flatus

After seeing our blurb on the herb Epazote (*Chenopodium ambrosioides*) and its use in traditional Mexican cooking as a spice added to beans to help reduce gas (see *HerbalGram* #17), our contributing editor botanist Jim Duke sent us the following information.

A *Washington Post* article (Dec. 12, 88) states that some scientists consider methane gas produced by the flatulence of livestock to be a major contributor to atmospheric carbon dioxide (and thus to the greenhouse effect). In fact, one Colorado State University scientist takes this theory quite seriously. Donald Johnson, a specialist in animal nutrition, has been studying the gas produced by range animals for 20 years!

According to Johnson, a cow emits 200 to 400 quarts of methane each day! The methane rises in the atmosphere and is converted to carbon dioxide, thus increasing the greenhouse effect. Other animals that contribute to this phenomenon are sheep, goats, camels, horses, water buffalo, deer, elk, and llamas. Johnson proposes that if antibiotics were added to the food of many of these animals, some of the bacteria that produce the methane would be killed, thereby reducing methane "emissions" by about 30 percent.

Dr. Duke surmises that the possible addition of Epazote to livestock feed may be just the ingredient that Johnson is looking for, although Duke's search of the scientific literature has not resulted in any studies that *scientifically* explain or validate folkloric use of Epazote to reduce gas in humans. Nevertheless, this will not stop Southwestern and Mexican cooks from continuing to use Epazote.

Duke writes: "Ruminants constitute nearly 75% of the 3,846,008,000 animals cited by the Foreign Agriculture Organization Production Yearbook. Ruminants are one major source of the methane accumulating in our greenhouse. While not taking the vegetarian stance of removing the animals (90% of the U.S. grain goes to animals), I think we should look into the remote possibility of reducing ruminant eructations and/or flatulence.

"The folk belief that Epazote reduces flatus in humans prompted the enclosed poem. Perhaps we should investigate the potential of reducing atmospheric methane by including Epazote in ruminant feed. Conversely, if we could somehow harness all that manure and methane, we wouldn't need quite so much petroleum."

Gas Under Glass
(et tu, CO-2)

We've heard all the dire exclamations
About CO-2 emanations;
CO-2 may contribute to our end!

But if the plants that should be planted
Help to save our grungy planet,
Plants replace dogs as Man's best friend!

If vegetarianism comes to pass
Carnivorism shouldn't last;
We should all start eating grass
And better types of phytomass.
Conservationists are aghast
At the cost of zoomass!
Those who live in house of glass
Should think twice ere passing gas.

— *Anon de Flatus*

Pepped-Up Potency In Herbs

Herbalist Michael Tierra gleaned this interesting tidbit from a 1981 report in the *Journal of Ethnopharmacology:* It should be of interest to herbalists and product formulators of various herbal products that a study established a scientific basis for the use of herbs in the Ayurvedic "Trikatu" group of acrids, including long pepper (*Piper longum*), black pepper (*P. nigrum*), and ginger (*Zingiber officinale*). According to the study, these herbs significantly increased the overall bioavailability of drugs (vascine and sparteine) either by promoting the rapid absorption from the gastrointestinal tract, by protecting the drug from being metabolized/oxidized in its first passage through the liver after being absorbed, or a combination of these two mechanisms.

According to Tierra, "This establishes a scientific basis for the use of small amounts of such peppers as catalysts and enhancers of the primary properties of other herbs in formulations. In the West, herbs such as ginger, cayenne pepper (*Capsicum* spp.), or the acrid composition powder of the Thomsonians were given in small percentages (usually less than 10%) to enhance the effects of the primary herbs in tonic formulas. In India, Ayurveda has used the combination of long pepper, black pepper and ginger in a similar manner.

"Of course, according to Traditional Chinese Medicine, there are conditions in which the addition of such heating peppers and acrid-tasting herbs would be contraindicated. This would be in individuals with 'wasting heat' conditions," Tierra continues.

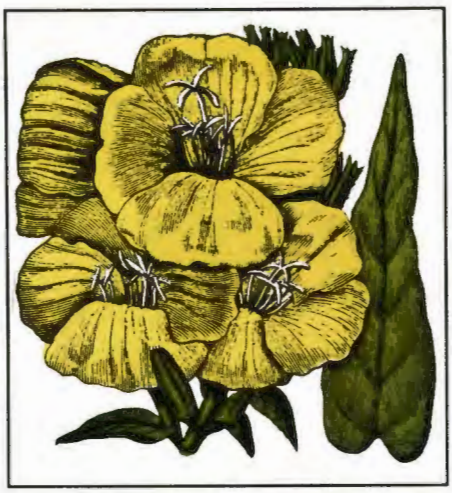
"Experiments such as this that scientifically examine the basis for traditional approaches of herbalists through the ages are to be commended as a worthwhile direction in the contemporary evolution of herbal medicine." (The study cited was printed in the *Journal of Ethnopharmacology* 4 (81), pp. 229-232.)

Nobel Laureate Supports Natural Products Research

Sir James Black, 64, of King's College Hospital Medical School in London, was one of the three Nobel Prize winners in the field of medicine announced last fall. Numerous press reports lauded his many contributions to medicine: the beta blocker drug propranolol (Inderal), used for heart patients, and the anti-ulcerdcrug cimetidine (Tagamet). But what the magazine and newspaper accounts failed to mention is the fact that, despite numerous invitations and enormous respect among his medical and pharmaceutical colleagues worldwide, Sir James is on the Board of Directors of only one company, Efamol Ltd., the pioneer in research and development of Evening Primrose Oil (EPO).

Sir James shares the Nobel prize with two American scientists, George Hitchings and Gertrude Elion, who have spent 40 years with the pharmaceutical firm Wellcome, for whom Black also did some research in 1978 and during subsequent years. Black's Nobel Prize comes as a result of the work he did for ICI (a British pharmaceutical firm) in 1964 when he developed propranolol, the first drug in a new class called "beta blockers" that blocked adrenaline from receptors in the heart muscle cells. The challenge to Black and his colleagues was to try to get more oxygen to the heart muscle that was deprived of adequate blood supply. Black inverted the challenge: instead of trying to get more oxygen to the heart, why not reduce the need for increased oxygen by blocking the adrenaline that produced the need in the first place. Propranolol became the world's largest-selling drug under the trade name Inderal.

Inderal sales were later surpassed by a new drug, cimetidine, that Black developed for Smith, Kline and French in 1972 as a remedy for stomach ulcers. Under the trade name Tagamet, this drug has revolutionized the way surgeons deal with stomach ulcers. Now, instead of facing surgery, the patient takes the drug which acts to block the effect of histamine that induces additional acid secretion.



Evening Primrose *Oenothera biennis*, from *The Illustrated Dictionary of Gardening*, Geroge Nicholson. ca 1888.

"Black in the laboratory has relieved more human suffering than a thousand doctors in a lifetime at the bedside."

All of this work was performed 15 to 25 years ago. Black is now involved with the formation of a small new pharmaceutical company called Scotia Pharmaceuticals, a division of Efamol Ltd. The company's first product is a drug called Epogam, containing oil from evening primrose. Epogam has received a drug license from the British Committee on Safety of Medicines for atopic eczema. According to an article in the *Financial Times* (October 27, 88), EPO was tested at 10 medical centers on 350 patients, having the effects of alleviating many of the symptoms of eczema, especially the itching.

The article also points out that Scotia plans to accumulate clinical data to show that Epogam can be effective in dealing with rheumatoid arthritis and other disorders associated with GLA deficiency: some complications of diabetes, premenstrual tension, and alcoholism. The company is hopeful that its drug license will eventually be broadened to include these conditions.

At Scotia, Sir James will act as a non-executive director, helping to guide the company's overall research strategy, while most of his time will be spent on his own research at King's College Hospital in London.

According to the *Financial Times* article, Black acknowledges that "many orthodox medical researchers are suspicious of Scotia's concentration on natural products 'because there is a feeling that it smacks of folk medicine'." But he emphasizes that the company follows the best practices of the modern pharmaceutical industry.

Another article in the *Observer* (Oct. 23, 88) quotes Professor Desmond Laurence, head of pharmacology at University College London: "Black in the laboratory has relieved more human suffering than a thousand doctors in a lifetime at the bedside."

Yet, despite the millions of dollars in profits made by ICI and SKF on Black's inventions, he is not a wealthy man himself, choosing instead to live comfortably rather than in luxury. He spends most of his time trying to solve new problems rather than trying to make money.

"I am addicted to medicinal chemistry. I get high on it," he is quoted as saying. "There have to be ways to fund work that is at the controversial stage. Industry relies on work that is done into the unknown. It is at its most successful when it is not trying to make money, but simply solving problems." ❐

Maté Production Rises In Argentina

A tip of the *HerbalGram* media hat to *Los Angeles Times* staff writer James F. Smith for his comprehensive article on the popularity and ritual importance of the South American beverage yerba maté *(Ilex paraguariensis*) which appeared in the August 10, 1988 edition. The article discusses the passionate respect many South Americans have for this herb, its ritual uses, and some impressive figures on its cultivation and export.

Among some of the points covered are the following:

The herb is enjoyed by both natives and folks of European ancestry. It was originally introduced by the Guarani Indians. An elaborate custom of preparing maté has developed in which the beverage is drunk hot out of a calabash gourd (which is also called a *maté*) through a silver tube or straw with a bulbous filter, called a *bombilla*. It is passed hand to hand among friends and drunk in a ceremonial fashion. Over 2,000 words are included in the maté vocabulary and one bibliography cites 270 different names for the plant and the beverage.

Mate's popularity among various ethnic populations of South America is a kind of bonding force in an otherwise ethnically diverse culture. Citing one local aficionado, the people in Buenos Aires "have become bourgeois, have lost their roots. Maté helps us hold onto our history." Over 200 brands of the tea are currently on the market in Argentina of 1,500 that have previously been patented.

Maté is considered to be highly nutritious. Aside from its caffeine content of 1.2 to 2% (known in Latin America as *mateina*) it also contains vitamin C, vitamins B1 and B2, with a bit of vitamin A and sulfur. It helps promote digestion and is diuretic. It was known that Argentinian gauchos (cowboys) could live on beef and maté without succumbing to scurvy, presumably due to maté's vitamin C content. Maté's properties are confirmed by Professor Horacio Conesa of the University of Buenos Aires Medical School who has reviewed much of the research on maté. The article quotes him as saying that "There is not a single medical contraindication" of the maté habit. However, *HerbalGram* editors caution our readers to note that the aspects of consuming caffeine-rich beverages apply here.

The future looks bright for the maté plant. Once cultivated by Jesuit priests in the 1500s, the plantations were abandoned in 1767 when the Jesuits were expelled from Latin America. Serious maté cultivation was again initiated at the turn of the century. Apparently, the plant grows only in the general region; attempts to grow it in other countries have failed.

Argentine consumption now totals over 175,000 tons per year, or 11 pounds per person. By contrast, coffee consumption is about 40,000 tons annually. Uruguay is the most dedicated maté-consuming country with 22 pounds per person per year. Brazilians in Sao Paolo drink eight times as much maté as tea.

Argentina's maté exports have quadrupled since 1976 to 12,000 tons per year. The primary buyers are Uruguay, Syria, and Chile. The Argentine government has authorized the production of an additional 100,000 acres of maté for next year which will bring total production up to 437,000 acres.

A new major customer looms on the horizon. The Japanese have been studying maté for five years with the possible intention of importing it as a supplement to the Japanese diet. ❐

Northwest Herbalists of Note

The Northwest is an area rich in the use of herbs and alternative medical therapies. A number of newspapers have printed articles on herbs, herbalists, and naturopathic medicine over the past year or two. We thought it appropriate to include several of them here.

The Oregonian (July 14, 88) in Portland, Ore. ran a large article on herbalist Cascade Anderson Geller titled "Herbalist Soothes with Natural Salves." Geller is well-known throughout the Northwest as an herbalist and field botanist. She teaches Medical Botany at the National College of Naturopathic Medicine in Portland, in addition to conducting numerous lectures and workshops. Among many other issues, Geller points out the herbalists' concern for the environment: "A lot of environmental concerns affect herbalists directly. Acid rain is one. The wholesale destruction of the rain forests is another. Yet another involves the harvesting of old-growth timber, and thus, their old-growth gene pool."

"The majority of plants Geller depends on she considers edible as well as medicinal," says the article. For instance, the addition of bitter greens—like trendy radicchios and endives—gives evidence that "we're getting back our ancestral tastes. It's a nice reminder that what we eat should be our medicine."

Herbalist Tony Bigginton, the director of production at Herb Pharm in Williams, Ore. is the subject of an article, "English Herbalist Settles in Williams," which appeared in the Medford, Oregon *Mail-Tribune* (April 17, 88). Bigginton started as an apprentice at Herb Pharm, a manufacturer of herbal extracts. He was later hired as the company's production director, in charge of harvesting, processing, extraction and laboratory procedures, and bottling of the extracts. Bigginton has had two years' training at the National Institute of Medical Herbalists in England before coming to the U.S.

Endive. Chicory *Cichorium Intybus,* from *Handbook of Plant and Floral Ornament,* Richard G. Hatton, 1960

Japanese Herbalists on Northwest Walk

Another article in the Medford *Mail-Tribune* (July 14, 88) discusses the visit of a group of Japanese plant scientists who stopped by the southern Oregon area on their way to the joint meeting of the American and Japanese Societies of Pharmacognosy in Utah (see *HerbalGram* number 17). At the invitation of Southern Oregon State College (Ashland) Professor of Botany and Ecology Frank Lang, the three Japanese pharmacognosists were interested in visiting the southwestern Oregon area to determine whether some of the local plant species were similar in chemistry to some related species that they are researching in Japan, and the possibility of finding more potent levels of some of the chemical components desired in the production of certain drugs.

For example, a species of *Vancouveria*, "inside-out flower" (anchor plant in Japan), has been used for 3000 years in Chinese medicine for its tonic properties, and more recently to stimulate the cardiovascular system and as a treatment for Alzheimer's disease. Another Oregon plant, Leach's Sophora (*Sophora leachiana*), has been used in China to relieve psychological depression and relieve high blood pressure and has recently been used in a commercial drug in Asia. Still another plant, Vanilla Leaf (*Achlys triphylla*), has produced extracts used to produce a drug for treating leukemia.

The idea that several distinct species of the same plant genus occur in two remotely separate geographical regions is known in botany as disjunct botanicals. For further information on some of the disjunct species occurring in North America and Northeast Asia, the reader is referred to the publication "East-West Botanicals" by Steven Foster, available from the author at P.O. Box 106, Eureka Springs, AR 72632. $8.20 postpaid; also "Chinese Herbs in the West" by Christopher Hobbs, Botanica Press, Box 742, Capitola, CA 95010.

"Marijuana, Cranberries: Gaining Respect"

So reads the title of a short article in the September 17, 1988 issue of *Science News*. The article mentions that the "two marginal members of the clinical pharmacopoeia" received minimally "tentative support" in the form of an administrative law judge's order and a note in the *Journal of the American Medical Association*, respectively.

Regarding the pot, a judge at the Drug Enforcement Administration (DEA) recommended in September that the DEA move to reclassify marijuana to a less restrictive status, thereby allowing patients with multiple sclerosis or chemotherapy-induced nausea to have easier access to it. The judge called marijuana "one of the safest therapeutically active substances known to man."

As far as cranberry goes, two medical doctors writing in the September 9, 1989 issue of *JAMA* concluded that there is tenuous evidence that cranberry juice may be useful in preventing and treating urinary tract infections. The physicians were not certain whether the old folk remedy's mode of action was due to the possible acidification of the urine, or how much cranberry juice is a proper dosage level to achieve the purported therapeutic effects. (See a more complete treatment of this in Research Reviews; page 20.)

Herbs are Becoming a "Big Business" in China

According to the March 1988 issue of the *Chinese Medical Journal* the growing of medicinal plants has become a big business in China these days. The article claims that a quarter of a million households and 6000 farms grow medicinal plants and that 570 pharmaceutical factories produce in excess of 4000 traditional Chinese medicines. (*Science News*, Vol. 134, Sept. 17, 88.)

African Herbal Medicine

Herbal medicine is alive and well in Ghana, West Africa. According to an article in *The Economist* (November 5, 88), the Psychic and Traditional Healers Association claims to have 30,000 members who care for three-quarters of the country's population. They even have a research center, The Centre for Scientific Research in Plant Medicine, which tests and catalogues traditional herbal remedies and then distributes the proven ones around the country. The founder of the Centre, Dr. Oku Ampofo, received his doctorate in Edinburgh, Scotland.

At the Centre, patients are diagnosed according to Western medical procedures, although they are treated with plant remedies. The Centre claims to be able to control or cure malaria, asthma and sickle-cell disease. The article reports that Dr. Ampofo has been working on an herbal treatment for cancer for 20 years with the National Institute of Health in Washington, D.C. Mrs. Diane Robertson, a researcher from the Johns Hopkins Medical School, reportedly was cured of cancer by Dr. Ampofo's treatments.

The herb, *Indigofera arrecta*, is particularly notable, as it has leaves which are made into a tea to treat diabetes. The article says patients who use this tea for three months or longer claim favorable results. Unlike insulin, the tea does not produce hypoglycemia or require a physician's supervision.

Cryptolepis is another herb mentioned. This shrub might be able to replace conventional anti-malaria drugs which are becoming increasingly ineffective against malaria, a killer of nearly one million Africans each year. Unfortunately, the Ghanan government lacks the funds to be able to produce a drug from this plant, so it appears to be confined to the use of the indigenous healers.

The Hoxsey Film:
Can Healing Become a Crime?

It is one thing when a group of independent film-makers produces a documentary on a subject; it is yet another when the film is shown on national television on HBO/Cinemax. That is exactly what happened with the film "Hoxsey: Quacks that Cure Cancer," now being called "Hoxsey: How Healing Becomes a Crime", by Santa Fe, New Mexico film maker Ken Ausubel.

Ausubel spent five years researching the story of Harry Hoxsey, who ran a chain of cancer clinics in the 30s and 40s from his base in Dallas, Texas. Hoxsey claimed a high success rate of cancer cures from his clinics. He challenged the orthodox medical establishment, going so far as to advertise his clinics on radio stations. After repeated attacks and condemnations by the American Medical Association, he challenged the AMA to prove his cure worthless.

His "cure," known as the "Hoxsey Formula," was a combination of herb extracts that Hoxsey learned from his father. The film claims that Hoxsey's great-grandfather noticed that an old horse, which had been put out to pasture to die from some type of cancer, showed recovery after eating some wild herbs in the field. From this observation, Hoxsey's great-grandfather developed the herbal cure, adding some popular folk remedies. As his father was dying, so the story goes, Hoxsey promised to make the remedy available to anyone in need, regardless of ability to pay. Hoxsey was subsequently able to build a large business based on the cure, but the film contends that he continued to give it away freely to anyone who could not afford it.

Filmmaker Ausubel has gathered interviews with numerous personalities who played a part in the Hoxsey drama. The film is a combination of narrative and interview, interspersed with film clips of Hoxsey's own words. The documentary has been highly successful in the film critics circle, winning such honors as the Eastman Kodak Award. The producers claim that its showing on HBO/ Cinemax last fall generated the highest viewer response to date for a documentary film on that channel.

I first became aware of the Hoxsey Formula and Harry Hoxsey story in the mid-70s when I heard about it from the late herbalist John R. Christopher. He also had developed an herbal product based on the Hoxsey formula. He called it Red Clover Combination because Hoxsey's formula used Red Clover Blossoms as the first ingredient. I was aware that herbalists considered Red Clover to have "blood-0purifying" properties; it was therefore a natural ingredient to include in a combination of herbs that were intended to help cure cancerous conditions; or at least that line of thinking seemed reasonable to me at that time.

The polemics of whether the AMA/FDA were on a witch hunt with respect to Harry Hoxsey are not really relevant here. The producers of the film supply ample evidence to convince the viewer of just such a position. However, what is of central interest to *HerbalGram* readers is the fact that Hoxsey apparently enjoyed a degree of success with his herbal cancer cure.

The film-maker's interview with USDA Botanist James A. Duke reveals that a number of ingredients in the formula have been proven to contain some chemical compounds with reported antitumor activity. (See accompanying article by Dr. Duke.)

The Hoxsey film has received publicity since its debut last year. It was the subject of a major article in the July/August 88 edition of *New Age*, plus numerous other publications, including the *New York Times*, the *Los Angeles Weekly* and *Los Angeles Times*. It also was picked as the critics' choice in the *Chicago Reader*. It was even shown at the Kennedy Center to representatives of 70 congressional offices. This screening was reported on National Public Radio.

Whether one supports the idea that plants may hold the key to future cancer remedies or not, this film is a welcome addition to the history of American folk medicine. In fact, the prestigious National Library of Medicine asked the producers to donate a copy.

Producer/writer Ausubel has taken an obviously biased position with respect to the AMA's attempts to close Hoxsey down. The film asks some interesting and disturbing questions regarding the motives of some elements of what might be termed "the cancer establishment"—questions that remain to be answered.

The film makes a compelling argument for its case. First, Hoxsey appeared to be motivated by altruistic motives as well as economic. In spite of the fact that he built his small empire into 17 clinics, he continued to honor his commitment to his father and gave the formula away freely to anyone unable to pay for the treatment. Second, several of Hoxsey's would-be detractors, including nurse Mildred Nelson and *Esquire* writer James Wakefield Burke, became two of his chief champions. Third, Hoxsey was successful in winning several federal court cases that upheld the therapeutic value of the treatment. Fourth, he went on record numerous times inviting and challenging the AMA and/or the FDA to test his formula to determine its efficacy. This challenge went unmet. The film quotes one Dallas-area FDA official as saying the reason the cure was not tested was because the agency did not want to give Hoxsey the stature and credibility of such recognition. Finally, modern research validates some of the potential antitumor properties of some of the herbal ingredients. (See Table 1 on page 13.)

If all this is true, it supports the film's thesis that Hoxsey was hounded by biased and possibly self-interested officials who were not necessarily acting in the public interest, even though they made repeated charges of quackery against Hoxsey. These charges were never proven. In fact, the film points out that Hoxsey was the firs tever to win a libel suit against the AMA, after the organization had "gone too far" in defaming him.

See Hoxsey, page 12

The Synthetic Silver Bullet vs.

by James A. Duke, Ph.D.

How many times has your doctor prescribed fiber, vitamins, and/or minerals for you? Chances are good he gave you a synthetic pill containing a strong chemical compound. There's at least one chance in four he may have prescribed a pill that contained a natural chemical compound from a higher plant, a second chance in four that it came from a fungus or animal. But that pill will have the isolated chemical, usually omitting the synergistic and antagonistic compounds that accompanied the chemical in Nature. Nature's compounds and their allies are so complex as to befuddle the pharmaceutical profession. So they take one compound or so from the plant, usually one of the more active, leaving behind hundreds of compounds that accompanied the one they extract. All the fiber, minerals, vitamins, and usually the alkaloids, glycosides, and more obscure secondary metabolites are thrown away, so that you will get the purified silver bullet. It's easy to test a single compound, but all but impossible to test that complex herbal mixture that Nature prepared for you.

If you were to take a "calculated risk" and consult with an herb doctor you trusted, you might be getting an herb, with all its vitamins, minerals, fibers, and a whole host of bioactive compounds, with their checks and balances, usually herbs that humans have been ingesting for millennia.[1] On the other hand, your medical doctor might even say that most Americans get too many vitamins. But if you smoke (more than 25% of Americans do) or drink too much (more than 10% of Americans do), you may be short on a few vitamins and minerals. And if your diet parallels that of half of Americans, you don't get enough fiber. If you are old, and nearly a quarter of us are, you may be short vitamins or minerals, e.g., the calcium and iron so frequent in herbs, especially the leaves. If you are under stress, and perhaps another quarter of us suffer stress today, that, too, may be depleting you of certain vitamins. And the more than half of us that are female may suffer anemia part of many moons of our lives, anemias that may call for iron, and vitamins B_6 and B_{12}.

It's easy to test a single compound, but all but impossible to test that herbal mixture...

If your M. D. has diagnosed your one ailment properly (and you suffer only one ailment, and are not deficient in any of the minor or major nutrients, vitamins, and/or minerals), chances are good that the silver bullet will help. Ninety percent of people who go to the doctor are going to get well, even without the silver bullet. That 90% might just as well have taken the herbal shotgun shell, assuming it is innocuous and judiciously taken. Middle class Americans are becoming more and more judicious about such matters as diet, exercise, and alternative medicines. They don't want the wrong herb or the wrong synthetic. They are leaning towards natural dyes, antioxidants, foods, etc., but they are being discouraged as they seek out natural herbal medicines. There are poisonous herbs[2], just as there are poisonous synthetics. The herbal practitioner, unless he is a medical doctor, may be suspect if he prescribes. The herb dealer is suspect if he sells an unapproved[3] herb if, in the same room, there is published information suggesting medicinal uses for that same herb.

Most herbs do contain vitamins, minerals, fibers, antioxidants, antitumor agents, and antiseptics, and many, if not all, contain, in addition, several other types of bioactive compounds. Leaves of herbs are particularly rich in vitamins A, C, and E, iron, calcium, and fibers, not to mention that all-important world-feeding chlorophyll, always accompanied by alpha-tocopherol (Vitamin E). Seed herbs are more liable to contain essential fatty acids, sterols, and mem-

Hoxsey, *continued from page 11*

If Hoxsey was guilty of quackery (that is, unscientific medicine), it appears that there is no evidence to support that he was *intentionally* defrauding his patients. There does not seem to be any evidence to support the allegation that the remedy is not effective, although critics might want to point to the fact that Hoxsey eventually contracted cancer and had to undergo surgery when his own remedy failed to work. And yet, even his most ardent antagonist, Dr. Morris Fishbein of the AMA, admitted in court that one of his formulas cured some forms of external cancer. The film also notes that Oliver Field, former director of the AMA Bureau of Investigation, conceded that a Hoxsey formula did have merit for the external treatment of skin cancer using very minute amounts applied several times. What the film seems to miss is the distinction between the Hoxsey formula used internally and an entirely different formula containing Bloodroot (*Sanguinaria canadensis*) which was employed for external use on skin cancers.

Regardless of one's personal views on this subject, what is certain is that the public will continue to hear about this interesting chapter in the history of American folk medicine. Producer Ausubel has signed an option agreement with Esparza/Katz Productions of Los Angeles (producers of "Milagro Beanfield War" and "The Body Human" for PBS) who are interested in making a full-length feature movie of the Hoxsey story.

In the meantime, interested parties may obtain a videotape of the film, priced at $39.95, from the producers by contacting them at 505/983-8956. ❐

The Herbal Shotgun Shell

bers of the vitamin B complex, and gamma-tocopherols (vitamin E). Even woody bark contains a little starch and protein, and less well-known medicinal compounds like catechin, epicatechin, ethyl gallate, gallic acid, lignin, quercetin, phlorozin, tannic acid, and ursolic acid, plus smaller doses of the usual vitamins and minerals plus generous doses of fiber. So your herbal shotgun shell is a potpourri of bioactive compounds. Some doctors will admit that the homeostatic human body is pretty good at grabbing from this "soup" those things that it needs. And there are many obscure compounds there, ready for the grabbing, if needed. Few doctors will agree that the homeostatic human body can selectively strain the herbal soup and select only the needed compounds. The herbal shotgun shell offers a huge and varied menu, the silver bullet a very select and specialized compound or two, plus filler, usually non-nutritive.

With that rambling preamble, I should like to propose that there do exist bioactive compounds in that concoction that has been called "Hoxsey's Hoax." I am not here to support nor to refute the Hoxsey herbs, just to note the activity of compounds therein. Poor Hoxsey was haunted by the Health, Education and Welfare Department (HEW) of the day, whose claims were probably no closer to the truth than Hoxsey's. HEW stated back then, "Cancer can be cured only through surgery or radiation." That was before the marvels of phytomedicinals like vincristine and vinblastine from the Madagascar periwinkle for leukemia, and etoposide for bronchial and testicular cancer from Mayapple root had been derived from the herbal potpourri.

In Table 1, I list the major herbs of the Hoxsey formula, with the number of "Hartwell citations." Before he retired, Jonathan Hartwell of the National Cancer Institute published "Plants Used Against Cancer" in the Journal of Natural Products in 11 different installments. Since then, Mr. Alfred Hoch reissued them in one volume (Quarterman Publications, Inc., Lincoln, Mass. 01773). The number of Hartwell citations indicates how many references he cited, indicating the usage of the plant in folk cancer treatments. Of the 300,000 species of plants in the world, Hartwell reported folk cancer activity for 1%. All ten of the Hoxsey herbs were generously cited in the folklore. Hoxsey certainly was not alone in suggesting anticancer activity for these plants.

Class I herbs were listed in the 28th Dispensatory of the United States and Class II herbs were also treated there, with Class III herbs considered veterinary. None of the Hoxsey herbs were relegated to that beastly category. The dosages suggested for humans in the Dispensatory were usually about 2 to 3 magnitudes higher than the dosages in the Hoxsey formula. ❐

1. Most archaeolgists figure that humans entered the New World ca 12,000-15,000 years ago, but some few estimate 100,000 years. Assuming 25 years for a generation, that could mean somewhere between 480 and 4,000 generations for empirical observations on American medicinal herbs.
2. Hominid evolution through thousands of generations has exposed our genes and immune systems to many of the natural poisons, but not to new synthetics!
3. To be sold as a drug, it must be proved safe and efficacious for the ailment for which prescribed. It now costs $125 million to prove a drug (or herb) safe and efficacious.

Table 1 — Major Herbs in Hoxsey Formula

Herb	Hartwell Citations	Class	Human Dosage from 25th. Disp.	Hoxsey Dosage mg	Number of Compounds Reportedly Anti-oxidant	Anti-septic	Anti-tumor
Barberry Root Bark[1] *Berberis* spp.	6	II	2 g	10	1	9	3
Buckthorn Bark *Rhamnus frangula*	3	II	1-2 g	20	3	7	3
Burdock Root *Arctium lappa*	25	II	-----	10	-----	2	2
Cascara Sagrada Bark[2] *Rhamnus purshiana*	3	I	0.6-2 g	5	-----	7	2
Red Clover Blossoms *Trifolium pratense*	33	II	4 g	20	4	10	4
Licorice Root *Glycyrrhiza spp*	23	I	3-6 g	20	3	18	5
Poke Root *Phytolacca americana*	32	II	60-1,200 mg	10	2	3	2
Prickly Ash Bark *Zanthoxylum americanum*	6	II	1 g	5	-----	3	3
Stillingia Root *Stillingia sylvatica*	3	-----	2-4 g	10	0	0	0
Bloodroot[3] *Sanguinaria canadensis*	22	I	60-300 mg	External	0	5	5

1 - Various versions indicate that this might also be Oregon Grape Root (*Berberis aquifolium*).
2 - Some herbalists believe that "Cascara" mentioned in the Hoxsey formula could have been "Cascara amarga"(*Sweetia panamensis*), not Cascara sagrada. Cascara amarga is listed as an ingredient in the *National Formulary*, Edition V(1926), under "Compound fluid extract of Trifolium."
3. Bloodroot was only present in a formula used for external cancers.

Pent-up Demand Surfaces for Herbs/Spices

by Peter Landes, KHL Flavors
with additional material by *HerbalGram* staff

Dandelion
Taraxacum officinale,
from *Common Weeds of the United States*,
U.S. Department of Agriculture, 1970

The quarter since our last report has been an interesting one in these markets. Lots of dormant pent-up demand surfaced, seemingly all at once, for spices, medicinal herbs, and potpourri ingredients with spot shortages and rising prices an almost daily feature. Frustrated buyers and dealers scrambled to meet production schedules that allowed no flexibility in timing. This trend continues with very thin markets here and long, slow-moving pipelines.

SPICES

This market featured a sudden crash and almost-as-sudden recovery in the prices of **Black** and **White Pepper**. While prices have yet to climb back to the levels of 1987, the strength of the overall market and the defaults of Brazilian shippers on low-priced contracts created some fireworks for many importers and grinders. The **Cassia** situation continues murky with the government-controlled marketing board changing their minds about the marketing system practically hourly — nobody really knows if they'll get their shipments, who will be shipping these goods, when they will be shipped, or at what prices. Needless to say, coverage (if available) is advisable for as far out as can be managed, especially on **Sticks**. **Ceylon Cinnamon** is especially tight with arrivals snapped up as soon as released. **Cloves** have declined in price with Indonesia actually exporting rather than importing **Cloves** this year. The benefit to users is the availability at reasonable prices of beautiful **Indonesian Cloves**. **Whole Peppermint Leaves** are finally back in stock. **Cumin Seed** is reasonable and coverage should be extended. **Sage** continues steady but prices are expected to rise in February. **Chilies** (especially hot ones) are a problem. China is renegotiating their contracts, upwards, naturally, and may not ship anyway.

BOTANICALS

Many items that were in short supply for quite a while are now available with arrival of new crop material from Eastern Europe, but supplies are thin, probably in response to thin demand. This market has become increasingly strange with spikes in demand creating shortages and precious little follow-through. A large order will wipe out small spot supplies and dealers, faced with no continuing demand, will not restock. Vigilance is required; buy when material is available or be prepared to wait. This refers to **Althea Root** (Marshmallow Root), **Dandelion Root** (Raw and Roasted), **Elecampane Root**, **Horsetail** (Shave Grass), and **Eyebright Herb**. **Juniper Berries** and **Egyptian Chamomile** are exceedingly tight at holiday press time.

POTPOURRI INGREDIENTS

Demand in this market exploded right after Labor Day with manufacturers desperately ordering to fill neglected supply lines. It is believed that by this time spot U.S. manufacturers will have to pay more attention to advance contracting to meet their growing needs. Source countries are hard-put to meet increased demand and ingredients seem to fall from favor as fast as they are introduced. Almost as soon as pickers and growers are educated to produce a good-quality crop at a reasonable level, the material goes out of style and demand drops to zero. For example, according to Fred Hathaway, a major potpourri dealer, terrific competition at all levels has driven prices down, leaving relatively expensive items like **Bouganvillea Flowers** with little demand.

Pink Rosebuds are available, while **Red** are becoming scarce until arrival of new winter crop shipments. The **Globe Amaranth** shortage should be relieved in February or March with arrivals expected then. **Calendula** is available at amazingly low levels. **Spina Christi** is back in stock. Good-looking **Orange Peel** in potpourri cut is almost unavailable until after the winter pickings. The ubiquitous **Wood Chips** are even becoming short with manufacturers looking for good quality at low prices; the two rarely go hand-in-hand.

DOMESTIC BOTANICALS

Goldenseal Root prices are about four to five dollars per pound lower than last year. Current supplies look good. Apparently more buying this year has anticipated shortages like those of last year. One insider doubts that there is even a shortage this season; there seems to be plenty available in spite of severe drought conditions in some areas.

Lady's Slipper Root: Sources indicate that collectors can't give it away because the industry has been so effective in dealing with the conservation issue. This refers to the ASPA and IHGMA (International Herb Growers and Marketers Association) resolutions in which the herb industry has agreed not to buy wildcrafted **Lady's Slipper Root**. (See story in *HerbalGram* #17.)

There is still some interest for dried **Ginkgo Leaf**, but it is isolated as most demand from manufacturers is for the imported extract, not raw material. Although not usually considered a "domestic" herb, Ginkgo trees do grow in the U.S. since they were introduced from Asia. Dealers claim that it is difficult to get domestic raw material as Americans won't pick it.

Strong demand continues for **Echinacea Root** (both *E. purpurea* and *E. angustifolia*). Production figures are up as new growers enter into this market. Some producers claim a brisk market for leaf material, as well as root.

There's still demand for **Prairie Dock Root** (*Parthenium integrifolium*) as some manufacturers use it as a filler in "Echinacea" products. The flowers are finding a willing market as "American Feverfew" for use in the potpourri market. (Note: This is not to be confused with the Feverfew plant currently being investigated for use in migraine headaches. See "Research," page 19.)

American Ginseng Root growers are still able to export their harvest to Asia, but the continued ability to do this seems uncertain as U.S. herb experts have observed fields of **American Ginseng** being cultivated in China.

In closing, the obvious should be pointed out: given the vagaries of these disorganized little markets, the best way to assure a continued supply of quality spices and botanicals at reasonable prices is close cooperation and consultation with trusted, proven suppliers. All else basically constitutes irresponsible and unsound speculation. ❐

Ephedrine Supplies Become Tighter

As cold and flu season has come, supplies of ephedrine and pseudoephedrine have become more scarce. The two drugs are alkaloids derived from the Chinese Mahuang plant (*Ephedra sinica.*) Both drugs are used in over-the-counter cold and flu preparations for their decongestant properties. Natural ephedrine is tight due to seasonal buying by pharmaceutical companies for OTC drugs, plus the current shortage of plant material from China, a major world supplier.

Although weather conditions in Inner Mongolia where the plant is harvested have been quite favorable to produce adequate supplies, market reports indicate that growers are finding other crops that produce higher profit and are therefore switching over. It is also rumored that the Chinese may be stockpiling ephedrine in order to start production of pseudoephedrine.

Both natural and synthetic ephedrine and pseudoephedrine are used in OTC pharmaceutical products, where pseudoephedrine is becoming increasingly popular in decongestant products. The U.S. consumption of both drugs is estimated at 420 metric tons annually with a 5 to 8 percent annual increase.

In a related development, in November the Drug Enforcement Agency placed ephedrine and pseudoephedrine on a list of controlled substances that are essential or precursor chemicals sometimes used to make illegal drugs. This would simply require that importers and manufacurers keep on file all transactions for four years. (*Chemical Marketing Reporter*, Nov. 21, 88 with additional information from the *HerbalGram* staff.)❐

THE 36TH ANNUAL CONGRESS OF THE SOCIETY FOR MEDICINAL PLANT RESEARCH

by Rob McCaleb

...three of the hottest topics in natural products research are antitumor agents, polysaccharides, and immunomodulating agents. ...these three studies grow closer together with the realization that many antitumor agents may owe their activity to stimulation of the immune system; and many of the plants currently under intensive study contain polysaccharides with this effect.

The 36th Annual Congress of the Society for Medicinal Plant Research was held September 12-16 in Freiburg, W. Germany. Professor Varro E. Tyler of Purdue University kindly provided abstracts of the papers presented.

Therapeutic use of willow bark (*Salix* spp.) was discussed by B. Meier *et al.* The commonly-used *S. alba* (white willow) is actually quite poor in its content of the active salicylates compared to other species. The authors recommend preparations standardized to the salicin content specified in the German monograph (60-120 mg per daily dose). Also recommended is a pH-controlled extraction, rather than consumption of the powdered bark, since salicylates are only slowly metabolized in the intestines.

Onions
Allium cepa, from *De Viribus Herbarum,* Macer Floridus, 1482

Bayer *et al.*, reported on antiasthmatic effects of onion (*Allium cepa).* Extracts of onion have been shown to inhibit allergen-induced asthmatic reactions in humans and guinea pigs. This study fractionated the active chloroform extract, and isolated two classes of compounds apparently responsible for this effect (5 thiosulfinates, 2 1,4-dithiane derivatives).

Research by Ghosal *et al.*, has added another validation of the major Ayurvedic medicinal plants *Withania somnifera* ("Ashwaganda") and *Sida cordifolia* ("Bala") as adaptogens. In a battery of tests, compounds from the plants stimulated phagocytosis and immune cell proliferation suggesting "strong potential as immunostimulatory agents...[and] validate the use of the two plant drugs as health promotive agents in Ayurvedic medicine."

Westendorf *et al.*, report on possible carcinogenicity of the active principles of several laxative plants, including *Aloe*, *Senna* and *Frangula* (Buckthorn). The battery of three short-term tests used for the detection of mutagenic/carcinogenic properties are said by the authors to have shown 80-90% predictive value for the detection of chemical carcinogens. Of the 16 glycosides tested (hydroxyanthraquinones), four were found to cause mutation in more than one strain of bacteria used in the assay. As the implications of this research are unclear, these plants should be investigated by the more reliable rodent carcinogenicity assays to determine if they actually represent any potential risk.

Constituents of Pauo D'Arco (*Tabebuia avellanedae*) were investigated by B. Kreher *et al.*, (including H. Wagner). *Tabebuia* species have been investigated for antitumor effects. In the current research, nine compounds were found to possess dose-dependent immunomodulating effects on human immune system cells. This indicates that the ability of *Tabebuia* compounds to destroy cancer cells may be due at least partly to stimulation of our own immune systems.

Research at the Univ. of Munich continues (R. Bauer, H. Wagner *et al.*) in the search for the active principles of *Echinacea.* As *HerbalGram* reported earlier this year (*HerbalGram 15*), the most active constituents of Echinacea now appear to be in the lipophilic fractions (non-soluble in water). The current article describes the isolation and structure of newly discovered alkamides from the roots of two *Echinacea* species. Research continues on the pharmacology of the alkamides and other constituents of the lipophilic fractions, and these will be the subject of a future paper.

HerbalGram readers surely recognize that three of the hottest topics in natural products research are antitumor agents, polysaccharides, and immunomodulating agents. It is quite exciting to watch as these three studies grow closer together with the realization that many antitumor agents may owe their activity to stimulation of the immune system; and many of the plants currently under intensive study contain polysaccharides with this effect. I am sure we can expect more articles about polysaccharides in higher plants such as *Echinacea* and also in

See Congress, page 43

The Fifth International Ginseng Symposium, Seoul, Korea

by Ara Der Marderosian, Ph.D.

It was my pleasure this year to be invited to present a paper on our research at this symposium. I found the meeting to be exciting and a wonderful way to meet many of the foreign researchers in a beautiful setting. We were treated royally in the fantastic Lotte Hotel in Seoul and had a chance to be part of the Korean Olympic scene.

We even managed to be interviewed during the international coverage via NBC and Bryant Gumble on the topic of ginseng. The segment was understandably short but well done and even featured how ginseng is grown in Wisconsin.

The meetings were sponsored by the Korea Monopoly Corporation and boasted an attendance of several hundred researchers from all over the world. The organizers of the symposium (Chong Hwa Lee, Chairman; Too-Pyo Hong, President, Korea Monopoly Corp.; Kwan Lee, Ministry of Science & Technology; and many others), are to be commended for their skill in bringing together all the major investigators in the field. The hotel and the social and scientific gatherings were superbly organized and presented an elegant setting for the successful meeting. There were a total of forty papers listed in the program. Among the ginseng-related topics were:

... as more and newer classes of substances ...are isolated from ginseng ...a whole new range of activities can be verified.

Potential anticancer properties in humans
Utilization in cosmetics
Cytoxic effects against L1210 cells
Antianorexigenic properties
Tumor growth inhibitory substances
Cytosolic epoxide hydrolase activity
Anti-oxidative action of phenolic components
Kidney protective properties
Anti-tumor activity of polysaccharides in ginseng
Catecholamine effects
Protective effects on myocardial ischemia/infarction
Proteins in ginseng
Reticuloendothelial system potentiating polysaccharides
Immunological studies
Modification of interleukin responses
Cytotoxic principles
Micrometerological requirements in culture
Shape and compound relationships in ginseng quality
Biological activities of water-soluble fraction of ginseng
A chemical study of the saponins and flavonoids of dwarf ginseng (*Panax trifolius* L.)
RNA and protein biosynthesis in rat liver
Alcohol detoxification
Chi-deficiency syndrome
Arachidonic acid metabolism
Essential hypertension
Aged heart failure patients
Polyacetylenic compounds on lipid peroxidation
Liver cell proliferation
Diabetic rats
Experimental amnesia
Morphine tolerance and dependence
Polymorphonuclear leukocytes

Ginseng
Panax quinquefolius, from *Materia Medica and Pharmacology*, Culbreth, 1927

As can been seen by this wide spectrum of research efforts in several countries (England, United States, Korea, Japan, China, Canada, and Italy), there is no doubt about continuing interest in ginseng. It is also obvious that as more and newer classes of substances (besides the ginsenosides) are isolated from ginseng (flavonoids, polysaccharides, polyacetylenes, etc.), a whole new range of activities can be verified. It certainly behooves those of us in the U.S. to be aware of these studies so that they may help us in research on the American species (*Panax quinquefolius* L.) in more detail.

Finally, it should be noted that Koreans and other Asians, should be commended for their long-term commitments to ginseng research through interdisciplinary approaches involving the government, academia and industry. This is the sure way to success and their studies are certainly a model for all of us to follow. ❐

BENEFITS OF GARLIC

GARLIC REVIEW

A fairly good review of the literature on garlic can be found in the *Journal of the National Medical Association* (80(4), 88, 439-45). The review by T. Abdullah *et al.* from the Akbar Clinic and Research Foundation, with 109 references, summarizes the benefits of garlic, though in a fairly non-critical way. The article summarizes anecdotal and research evidence for garlic in many areas.

Antimicrobial effects of garlic protected French priests from the bubonic plague; and British, German and Russian soldiers from battlefield infections. The authors point to proven effectiveness against opportunistic microbes like *Herpesvirus hominis* type I, cryptococcal, mycobacterial and candidal organisms. It is also antifungal, antiparasitic and antiprotozoan.

Garlic's ability to lower serum lipid levels has been thoroughly researched. 20 references are offered in this review. "Hyperlipemia is the underlying pathophysiology of the number one killer, atherosclerotic coronary artery heart disease." Garlic also has an anticoagulant effect (inhibits blood clotting) which complements the hypolipemic activity. Studies suggest that garlic may lower blood pressure by acting like prostaglandin E_1, which decreases peripheral vascular resistance.

Garlic contains many nutrients, but we probably don't consume nearly enough of it for it to be a meaningful source of the vitamins and minerals listed in this article, a point that should have been made. Micronutrients, however, including trace minerals selenium and germanium, may be important to the activity of garlic.

As an antihepatotoxic, it protects the liver against liver toxins like carbon tetrachloride, and may be effective in treating lead, mercury and other heavy metal poisonings. It is also a "free-radical scavenger" eliminating these highly reactive oxidation products. Free radicals are implicated in aging, arthritis and cancer. The authors suggest that in addition to retarding aging, the antioxidant effect could be a useful adjunct to radiation or chemotherapy by reducing oxidation damage to normal tissue caused by these therapies.

The author commented on possible immunostimulant effects, saying: "Garlic may be a potent, nonspecific biologic response modifier." It increases phagocytosis by which invading organisms and abnormal cells are eliminated from the body. The dramatic increase in Natural Killer (NK) cell activity caused by garlic is no doubt involved in its anticancer, antiviral and antimicrobial effects.

At least 20 of the cited references refer to antitumor effects. Garlic is toxic to some tumor cells, prevents implantation of others, inhibits tumor enzymes, and may "unmask or alter" tumor cell antigens, increasing their susceptibility to our immune systems, which themselves are stimulated by garlic. "Residents of a region in China who did not eat garlic had 1,000 times more stomach cancer than those in a region who consumed large quantities of garlic regularly."

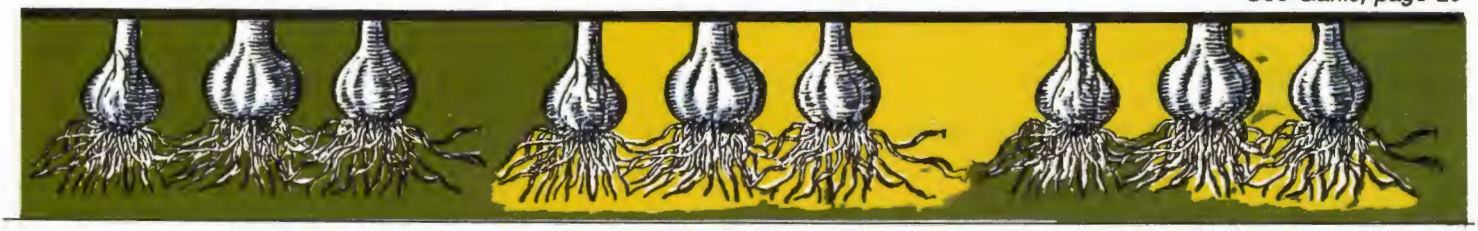
In Conclusion

The article errs in showing an excess of zeal for *Allium*. Several undocumented mentions are made to raw or "cold-aged whole-clove garlic" showing the greatest medicinal value, and one unsupported claim is made about the superiority of organically-grown garlic from "germanium- and selenium-rich unpolluted soil." Still, I happen to share the authors' enthusiasm for garlic, and I cannot summarize better than this single sentence from the authors: "No other substance, either natural or synthetic, can match garlic's proven therapeutic effectiveness." — R.M. ❐

New Clinical Trial of Garlic

Garlic has been known to have a beneficial effect on serum lipid (blood fat) levels since at least 1965. Many subsequent studies have verified this effect, both for garlic and for cooked or raw onions. Since high levels of lipids (i.e., cholesterol, triglycerides) in the blood are correlated with higher risk of cardiovascular disease, lowering these levels may be an effective preventive strategy against our leading killer disease.

See Garlic, page 20



AIDS NEWS: St. John's Wort Inhibits Retrovirus

The prestigious *Proceedings of the National Academy of Sciences* (85, 7/88, 5230-4) reports that two chemicals in St. John's Wort (*Hypericum* spp.) have "potent antiretroviral activity." The chemicals are the aromatic polycyclic diones hypericin and pseudohypericin. In testing by New York University Medical Center researchers Meruelo *et al.*, these chemicals were highly effective in preventing the spread of retroviruses both *in vitro* and *in vivo*. "A single injection of a small dose totally prevents the onset of FV-induced [Friend leukemia virus] disease and death in experimental animals. Preliminary *in vitro* studies with pseudohypericin indicate that it can reduce the spread of HIV."

Testing involved injection of the purified *Hypericum* extract either with live virus or within one day of infection. *Oral doses were also effective.* A single dose completely inhibited splenomegaly (enlargement of the spleen) caused by the aggressive FV virus. The virus could not be found either in the spleen or blood of treated animals. Most importantly, these compounds were devoid of "any serious toxic side effects" when tested on over 800 mice. (The compounds do show toxicity at higher doses, and can cause photosensitivity.) Make no mistake about it, this is a remarkable discovery. Every compound previously used against retroviruses is extremely toxic to normal cells, and this toxicity is the greatest limit on their use. Furthermore, the compounds can gain access to the brain, which is a reservoir of the virus in HIV infected individuals. The authors conclude:

> "*Hypericin and pseudohypericin display an extremely effective antiviral activity when administered to mice after retroviral infection. Their marked activity can completely prevent the rapid splenomegaly induced by aggressive viruses... The antiviral activity is remarkable both in its mechanism... and in the potency of one administration of a relatively small dose of the compounds. Availability of the Saint Johnswort plant throughout the world and the relatively convenient and inexpensive procedure for extraction and purification of hypericin and pseudohypericin further enhance the potential of these compounds.*"

Technical details: Extraction of *H. triquetrifillum* was at flowering time with acetone, cleanup by silica column chromatography. FV-induced splenomegaly in BALB/c mice completely inhibited at 10 days. 25 clinical parameters were tracked in toxicity testing. Radiation leukemia virus inhibition, tested by changes in H-2 antigen expression, was dose-dependent, 30-60% inhibition.❐

New Feverfew Headache Research

The Lancet (July 23, 88, 189-92) presents the results of an excellent study of Feverfew (*Tanacetum parthenium*) for migraine headache prevention. The study was everything it needed to be to conclusively confirm the plant's effectiveness: a randomized, double-blind, placebo-controlled crossover study. After a month in which all patients took a placebo, the 72 volunteers were allocated to a control or placebo group for four months, then switched for the final four months. Feverfew reduced the number of migraine attacks by 24% with a significant reduction of accompanying nausea and vomiting. There was no effect on the duration of attacks. Two "global assessments of efficacy" showed that Feverfew outperformed the placebo. In the first, patients ranked each two-month period from "much better" to "much worse." Patients rated 36% of the Feverfew periods "much better" and 1% "much worse"; compared to 21% and 10% of placebo periods. Also, without knowing which periods were which, 59% of patients reported the Feverfew periods were more effective. No serious side-effects were reported. Research was performed by J. Murphy *et al.*, Dept. of Medicine, University Hospital, Nottingham. Authors summarize: "Treatment with Feverfew was clearly associated with a reduction in migraine frequency, and in the vomiting associated with attacks; there was also a trend towards a reduction in migraine severity..." The authors caution that long-term effects should be studied, since lifelong treatment may be needed for migraines. Quality of commercial products must also be addressed, especially in light of a study showing wide differences in activity between products (*Lancet* 86, i: 44-5).

Souped-up Polysaccharide Against HIV

The *Hypericum* article and last issue's *Castanospermum* article (Antiviral Alkaloids Inhibit AIDS Virus, *HerbalGram* 17) along with this next item illustrate one point: As with so many other diseases, our best hope of conquering AIDS will probably come from the plant kingdom. The research team of Yoshida *et al.* from Yamaguchi U. School of Medicine is experimenting with chemical modification of natural compounds to enhance antiviral effect against HIV. Several algal sulfated polysaccharides have been previously shown to inhibit the HIV virus. Lentinan is an immunomodulating polysaccharide being studied for potent antitumor effects (see *HerbalGram* 16), but it shows virtually no effect against HIV. When researchers modified the chemical by sulfation, it displayed the ability to prevent the HIV virus from infecting human cells *in vitro*. The new chemical, lentinan sulfate, gains the antiviral effect but loses its anticancer effect. The antiviral ability of inhibiting reverse transcriptase (>98% reduction) is apparently completely due to the sulfation. Further research is needed to explore the immuno-modulating effects of sulfated and non-sulfated poly-saccharides. (*Biochemical Pharmacology*, 37(15), 88, 2884-91.)

Spirulina Returns to the News

Spirulina is a multicellular blue-green algae with excellent nutritional properties containing over 60% protein as well as various minerals, vitamins and chlorophyll. It enjoyed brief but lucrative popularity as a diet aid a few years back and has been seemingly in search of a market ever since.

As a nutrition source it is considered superior to the green alga chlorella, because chlorella is difficult to digest due to its thick cell wall. Recent research on Spirulina has focused on its ability to lower blood cholesterol levels. In 1986, a study by the Chiba State Hygienic College (*Study Report* 4:29, 86) demonstrated a positive effect on the growth of infant rats; and in 1984 Japanese researchers Kato *et al.*, demonstrated the effect of Spirulina on reducing cholesterol in the blood of rats (*Japan Nutritional Food Association Journal* 37(323), 84).

A current study in *Nutrition Reports International* (37, No.6, June 88) reports on experiments by Nakaya *et al.*, in which human volunteers were tested using a high cholesterol diet with and without Spirulina. The level of Spirulina used in the study was 4.2 grams per day, a substantially lower level than that used in the rodent experiments. This dosage produced a significant reduction of total serum cholesterol without significantly reducing beneficial high density lipids (HDL) and produced an improvement in atherogenic index, indicating that it "likely has a favorable effect on atherosclerosis." There was no significant effect on serum triglyceride levels. No adverse effects were noted. Though 4.2 grams per day is a fairly high level at today's Spirulina prices, it represents only a tiny portion of total dietary food intake. This research, along with the excellent nutritional value of Spirulina, supports proponents' belief that Spirulina may be a valuable food of the future.

Guar Gum for the Heart

Numerous sources of dietary fiber have now been shown to reduce blood cholesterol (oat bran, psyllium, xanthan gum, guar gum and others). A recent study in Finland (*Atherosclerosis*, 72, 88, 157-62) by J. Tuomilehto *et al.* demonstrated the effectiveness of guar gum in the treatment of *severe* hypercholesterolemia. Since the prescription drugs commonly used to treat this condition have serious side effects, less toxic therapies should be considered vital. 15-30 g. of guar gum per day reduced serum cholesterol 12-20%, with only the expected side effects. As with other dietary fibers, laxative effects were common as was flatulence (caused by gut bacteria consuming the nutrients our bodies can't use). However, since lower doses seemed to work as well as higher, these effects could be controlled. No weight loss was reported, indicating that guar gum does not inhibit nutrient metabolism.

Cranberry Juice for Urinary Infections

Cranberry juice has long been recommended and used for the treatment of persistent urinary tract infections. The *Journal of the AMA* (*JAMA* 260(10) 9/9/88, p. 1465) summarizes research on this aspect of cranberry juice. While it has long been speculated that cranberry juice lowers the pH of urine, direct experiments could only identify a temporary increase in urinary acidity. Another study attempted to evaluate the adherence of *E. coli* bacteria to the urinary tract mucosa, also with inconclusive results. Nonetheless, a 1968 study by Prodromos *et al.* reported a clinical improvement in 73% of patients who were given 480 ml of cranberry juice a day for 21 days. While research has failed to identify any cause for the effectiveness of cranberry juice in urinary tract infections, AMA's own manual, "*AMA Drug Evaluations*" (ed. 4, 80 p. 1326), suggests using liberal amounts of the juice in conjunction with drug therapy as a prevention for these infections.

Garlic, *continued from page 18*

Still, most people seem unaware of this remarkable effect of the *Alliums*, and the medical profession has hardly rushed to encourage their patients to increase their consumption of these foods, let alone encourage supplementation with garlic preparations. A recent article in the *Journal of Orthomolecular Medicine* (2(1), 87 15-21), by Bastyr College researchers S. Barrie, J. Wright and J. Pizzorno, confirms beneficial effects of garlic on blood chemistry. This is just the kind of testing needed to validate the effectiveness of natural products whose safety is already conceded. The double blind crossover study* found garlic oil perles could produce significant reductions in serum cholesterol levels, while significantly raising the level of high density lipoproteins. HDLs are considered "good" lipids which do not form artery-hardening plaque, while low-density (LDL) and very low-density (VDL) lipoproteins are considered the worst culprits. The experiments also demonstrated a significant lowering of blood pressure and platelet aggregation (thus lowering the risk of blood clots which could cause heart attack or stroke.) The dosage of garlic was 18 mg of garlic oil per day, equivalent to 9 grams of fresh garlic, or about 2-3 large cloves. The article does not divulge whether such a dosage is actually available in a commercial product, but 9 grams of fresh garlic is not an unreasonable level in the diet.

* In double-blind studies, neither the researchers nor the subjects know who is receiving placebos in order to avoid bias. Crossover means that the placebo (control) group is then given the active substance and *vice versa*, to neutralize any individual differences between groups. ❐

HUPERZIA:
Hype or Hope?

by Steven Foster

Huperzia
Lycopodium serratum, from *Flora Japonica*, Thunberg, 1787

An AP wireservice report on research about a memory-enhancing Chinese medicinal plant, "Huperzia," potentially useful against Alzheimer's disease, appeared in newspapers around the U.S. in mid-September. The reports focused on the research of Dr. Alan Kozikowski, a professor of chemistry at the University of Pittsburgh. Dr. Kozikowski has succeeded in synthesizing "huperzine A," an alkaloid isolated in 1986 at the Shanghai Institute of Materia Medica. In clinical trials on 200 patients in China, plant-derived preparations were shown to significantly improve impaired memories. According to the report, huperzine A, like tetrahydroaminoacridine (THA), a substance currently being researched for Alzheimer's, blocks an enzyme responsible for breaking down acetylcholine, a neurotransmitter known to be deficient in Alzheimer's patients. Huperzine A appears to be more potent and less toxic than THA. Further animal trials are under way in the U.S. and Switzerland.

The AP report has resulted in numerous queries to herbalists and herb sources about availability of Huperzia, mostly from consumers with relatives suffering from Alzheimer's. These inquiries prompted this HerbalGram report.

The source plant *Huperzia serrata* (Thunb.) Trevis. is placed in the family Huperziaceae by some botanists. However, the plant is more widely placed in the Lycopodiaceae (Club Moss Family), and is better known in Western-language botanies as *Lycopodium serratum* Thunb. (first described by Carl Peter Thunberg in *Flora Japonica*, 1784). According to Ohwi[1] it is a common and variable plant of woods in mountains in much of Japan, north to the south Kuriles, Sakhalin, Korea, much of China, Taiwan, Malaysia, and India.

Spores of various *Lycopodium* species have been used in western traditions for a variety of purposes. The powder has been used to dust pills and suppositories to prevent adhesion. The spores of *Lycopodium clavatum*, official in the *United States Pharmacopoiea* from 1863 to 1947 and the *National Formulary* from 1947 to 1960, were used medicinally as an absorbant to irritated surfaces, especially the folds of the skin in infants, as well as an absorbant styptic. Popular nineteenth century works on medicinal plants may often list the spores as "vegetable sulphu.r" The whole plant was once used as a diuretic and antispasmodic, and decocted for rheumatism, epilepsy, plus lung and kidney ailments. The spores are highly flammable. They have been used in the manufacture of explosives, fireworks, and in the flash powders of nineteenth century photography, as well as being used by magicians for quick "flashes." The pyramid-shaped spores have also been used as pointers on mounted microscope slides. Historically it was sometimes adulterated with the pollen of pines and firs, talc, and starches.

... huperzine A improved learning and memory retention and may be of therapeutic value in improving human cognitive function.

Huperzia serrata is used in Chinese medicine. It is known as *Jin Bu-Huan* (*Chin Pu-Huan*) and formerly as *Qian-ceng-ta* (*Ch'ien-ts'eng-t'a*). It is first listed in Wu Chi-chun's "Chih wu ming shih tu kao" (*The Authentic Names and Illustrations of Medicinal Plants*, compiled in the Qing Dynasty in 1848)[2]

The whole herb is collected year 'round, and used fresh or dried. In Traditional Chinese Medicine it is considered bitter, slightly sweet, and neutral. It is indicated for promoting circulation, dispelling stagnant blood, and is anti-inflammatory, anesthetic and analgesic. Major uses include an external application to bruises, swelling, hematemesis (the vomiting of blood due to gastric disorders), hematuria (blood in the urine), and hemorrhoids (3-10 g). It is also used for boils, scalds, and snake bite. The herb is used as a poultice or decocted. Injectable drugs developed from plant extracts have been used against sciatica, arthritis, and severe gall stones. According to one reference, the herb is considered slightly toxic, contraindicated during pregnancy, with warnings about over-dosage for internal use.[3]

Perry[4] lists properties as antispasmodic, diuretic, a corrective against nocturnal emission, and irregular menses. In New Guinea it has been used as a laxative for dispersing "the spell-of-death."

Duke and Ayensu[5] cite Perry, and also state that the spores are used to keep pills and people dry, and are used externally on abscesses, athlete's foot, and fungoid ulcers.

Chemical components include the alkaloids huperzine A, huperzine B, lycodine, lycodoline, serratine, serratinine, serratanidine, tohogenine; the triterpenoids: serratenediol, serratriol, 21-epi-serratenediol, and tohogenol (Duke and Ayensu; Hsu, H.Y. *et al. op. cit*).

Since 1986 several articles on the pharmacology of the plant by researchers at the Shanghai Institute of Materia Medica, Chinese Academy of Sciences, have appeared in *Acta Pharmacologica Sinica* and other Chinese journals (in Chinese with English abstracts). An article by Tang Xi-can *et al.* "Effects of huperzine A on learning and retrieval process of discrimination performance in rats"[6] reports on the isolation of huperzine A and its effect on rats placed on an electrified Y-maze grid and the animals' subsequent ability to learn to run in the safe area. The researchers suggest that the action of the alkaloid was due to an effect on the cholinergic system. Preliminary clinical trials showed that the alkaloid preparations improved short- and long-term memory of patients suffering from cerebral arteriosclerosis with memory impairment.

Huperzine A and huperzine B were first isolated in 1986 by Liu J.S. *et al.*[7] These researchers were the first to report on the anticholinesterase activity of the alkaloids. *In vitro* studies by Wang, Yue-e *et al.*, "Anti-cholinesterase activity of huperzine A,"[8] further confirmed that the alkaloid has a potent inhibitory effect on cholinesterase, an enzyme which breaks down the neurotransmitter acetylcholine. A study by Xu Hong and Tang Xi-can of the Shanghai Institute of Materia Medica[9] reported on the cholinesterase inhibition of huperzine B, which was found to be less potent than huperzine A.

Researchers Yan Xiao-Fang *et al.*[10] reported on studies in animal models that further suggested the compounds may be of

Huperzia: The China/Pittsburgh Connection

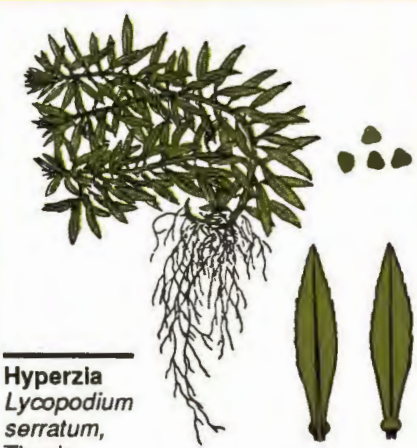
Dr. Alan Kozikowski, Professor of Chemistry, University of Pittsburgh

Dr. Alan Kozikowski, whose research group includes a number of Chinese scientists, indicated that, on a recent trip to China, one researcher found Huperzia had been pulled from herb store shelves in one region of China because of potential toxicity. Dr. Kozikowski has recently formed a new company to manufacture synthetic Huperzine A in order to make it available to other scientists for research purposes.— Editor

Huperzine A is a Lycopodium alkaloid isolated from *Huperzia serrata* (Thunb.) Trev., also known as *Lycopodium serratum* Thunb., a Chinese folk medicine. It cannot be found in the U.S. The Chinese have, over the centuries, brewed a tea from this plant and used it for medicinal purposes. The Chinese name for this folk medicine is Qian Cen Ta.

Work conducted in China led to the isolation of an alkaloid substance from this plant which has been named huperzine A. This compound has been tested in animals and found to exhibit memory-facilitating properties. In human clinical studies carried out at the Zhejiang Taizhan Hospital, evidence was obtained that huperzine A could improve the memory of individuals suffering from various memory impairments, including Alzheimer's disease, and that 1-4 hours after injections, such improvement was sustained for 8 hours.

Pharmacologically, huperzine A works as a potent anticholinesterase agent, although it may activate certain brain receptors as well. Huperzine A is more potent than the commonly used cholinesterase inhibitor physostigmine. Currently, the anticholinesterase agent known as tetrahydroaminoacridine (or THA) is being studied in the U.S. for the palliative treatment of Alzheimer's disease. In some cases THA has been shown to have some toxic side effects. Our group in Pittsburgh has succeeded in the total synthesis of huperzine A. We have developed an efficient route to this important natural product. The



Hyperzia *Lycopodium serratum*, Thunb.

synthesis procedure is sufficiently flexible such that a variety of related structures (or analogues) can be readily made. It is our aim to try to improve upon Nature's original contribution of a memory-enhancing drug to try to turn it into a more effective agent for use in the treatment of Alzheimer's disease.

Our work is carried out in collaboration with a pharmacologist, Dr. Hanin, who studies the effects of huperzine A and the new analogues on the isolated cholinesterase enzyme. This enzyme breaks apart the neurotransmitter known as acetylcholine. Compounds which pass this *in vitro* screen are then studied in certain memory experiments using rats.

In light of the fact that huperzine A has shown efficacy in the clinical studies carried out in China, we are optimistic that huperzine A or a synthetic analogue of it will find use in the treatment of Alzheimer's disease. We are thus continuing our research efforts as rapidly as possible and hope that we can expedite the discovery of a truly useful agent for the treatment of Alzheimer's disease. A variety of new "unnatural" huperzine A analogues have already been prepared and are now being tested for their biological activity. Our research work is currently being funded by the National Institute on Aging. Research support is also being sought from private foundations to accelerate the pace of our activity.

Huperzine A has not been approved for use by the United States Food and Drug Administration (FDA) and appropriate caution should be exercised in its use. Furthermore, the University of Pittsburgh makes no endorsements, representations, or warranties with respect to the use or application of Huperzine A.—

possible therapeutic value in the treatment of functional deficiencies of peripheral and central cholinergic systems.

A recently published report by Lu Wei-hua *et al.*[11] again studied the reaction of rats in a Y-maze. The researchers concluded that huperzine-A improved learning and memory retention and may be of therapeutic value in improving human cognitive function. An article by Zhu Xiao-dong and Tang Xi-can[12] showed similar results.

In several of the studies physostigmine, a substance with known anticholinesterase activity, was tested against huperzine A and B as a comparison. Huperzine A was found to be more potent than physostigmine in the experiments, while huperzine B was less potent.

Other members of the club moss family (Lycopodiaceae) undoubtedly share chemical components of similar or identical structure to the alkaloids in *Huperzia serratum* (i.e., lycodine, lycodoline, lycopodine). Since articles in the popular press have brought the plant to the attention of a broad public, inevitable claims will probably be made for related species. Consumers will seek out the herb or substitutes. It is probably one of those natural products that we will have to wait ten or twenty years before a commercial drug is widely available. When (and if) that time comes, it could be a bonanza for future natural products research. Until such time that questions of efficacy and safety on the crude herb or extracts, and those of related plants, are studied more thoroughly, it is my opinion that the plant should not be recommended to consumers. Certainly we will hear more on this one in the future.

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CALENDAR

March 16-17 — National Conference on Organic/Sustainable Agriculture Policies. Sponsored by the Center for Science in the Public Interest, the Minnesota and Texas Deptartments of Agriculture, and the Institute for Alternative Agriculture. Contact: Dan Howell, CSPI/Organic Conference, 1501 16th St. NW, Washington, D.C. 20036. (202) 332-9110.

March 30-April 2 — Society of Ethnobiology. Two days of paper presentations, one day of unannounced activities. Contact Betsy Lawlor, Dept. of Anthropology, U. of Cal., Riverside, CA 92521. 714/787-5524.

April 13-30 — Herbology of Greece and Turkey. Travel to the Mediterranean and learn ancient herbal wisdom with Svevo Brooks, Helen Nearing, and Juliette de Bairacli Levy. $3,150 complete. Contact Traditional Tours, Box 564, Creswell, OR 97426. 503/895-2957.

April 14 — American Herbal Products Assn. General Meeting. 10 am. Jolly Roger Inn Restaurant, Anaheim, CA. Pre-registration recommended. Contact: Kathy Hathaway at 714/523-8155.

April 16-19 — Caribbean-Europe Health Ethnopharmacological Seminar. Inventory of Traditional Medicine, Investigation and Promotion of Medicinal Plants in the Caribbean. In collaboration with the French Enthnopharmacological Association and ENDA-CARIBE. Contact Alex Huyghues-Despointes, 50-54 rue Ernest Deproge, 97200 Fort De France, Martinique, F.W.I. Phone 596/63-00-08. Telex CHAMCO 912 633 MR.

April 28-June 23 — Traditional Medicine Tour to China. Visits to major traditional medicine colleges, hospitals, and herbal research centers in 5 major cities; ginseng growing areas in Shenyang province in North. Contact Australasian College of Herbal Studies, P.O. Box 4451, Auckland, New Zealand. ph: 09/727-927.

June 11-14 — Society of Economic Botany Symposium, Knoxville, TN. "Conservation of Plant Genetic Resources." Contact: Ed Shilling, Dept. of Botany, U. of Tenn., Knoxville, TN 37996-1100

July 22-25 Herbs '89 — Herb Growers and Marketers Conference/Fourth annual sponsored by the International Herb Growers and Marketers Association, Purdue Univ. and Univ. of California, Davis. Red Lion Inn, San Jose, CA. Contact: Maureen Buehrle, IHGMA, P.O. Box 281, Silver Springs, PA 17575.

July 27-August 15 — Tibetan Herb Walk and Practical Seminar. A two week seminar on herbs of the Tibetan tradition, to take place in Ladakh, India, near the Tibetan border. Cost is $3500 which includes air fare from the U.S. West Coast. Payment due by May 1, 1989. Contact: Chakpori Institute of Medicine, P.O. Box 956, Boulder, CO 80306.

August 6-10 — American Society of Pharmacognosy Symposium "Natural Products and the Disease Condition." Sessions on "Documentation of Use," "Potential of Plant Use For Cancer and AIDS," "Biotechnology of Natural Products." Contact Dr. Pedro Chavez, School of Pharmacy, U of PR, G.P.O. Box 5067, San Juan, P.R. 00936. 809/758-02525.

November — International Conference on Holistic Health and Medicine. Bangalore, India. Contact: Dr. Issac Mathai, International Conference on Holistic Health and Medicine, c/o Travel Corporation India Pvt. Ltd., 9 Residency Rd., Bangalore-560 025, India. ❐

ST. JOHN'S WORT
Hypericum perforatum L.
A Review by Christopher Hobbs

St. John's Wort
Hypericum perforatum,
from *School Botany, Descriptive Botany, and Vegetable Physiology,*
John Lindley, 1880

St. John's Wort has been used for centuries in folk medicine as a protective medicine for nervous disorders, wounds, burns, and urinary infections. Modern research validates some antibacterial, antiviral, anti-inflammatory, sedative, and brain-chemistry modification activity. Recently, a strong inhibition of the AIDS virus, with low toxicity, by hypericin and psuedohypericin, two main active constituents from St. John's Wort, was confirmed. Photosensitization has been reported in animals grazing on the plant, and the FDA, therefore, has not granted safe status to whole plant preparations. Despite this, there has never been a report of toxicity in humans.

INTRODUCTION

Among the many medicinal herbs used throughout the long history of Occidental culture, St. John's Wort (*Hypericum perforatum* L., has always been and still is of great interest. From the time of the ancient Greeks down through the Middle Ages, the plant was considered to be imbued with magical powers and was used to ward off evil and protect against disease. As a practical folk remedy, it has been used widely to heal wounds, remedy kidney troubles, and alleviate nervous disorders, even insanity.

In the last thirty years *Hypericum perforatum* has undergone extensive clinical and laboratory testing. The present article reviews the plant's botany, history of use, chemistry, pharmacology, pharmacodynamics, medical uses, and preparations.

BOTANY

Taxonomy and Description

St. John's Wort is a member of the genus *Hypericum*, of which there are 400 species worldwide. There is some disagreement as to the plant's family, some placing *Hypericum* in the segregate family Hypericaceae, while others place it in the family Guttiferae. However, most researchers now think that the morphological and chemical differences of the two families are insufficient to justify separating them[1,2].

The plants are described as glabrous perennials, erect and usually woody at the base. The ovate to linear leaves are sessile, opposite, and well-supplied with translucent glandular dots. The regular flowers have five short, subequal, entire, imbricate, basally connate sepals, and five persistent-withering yellow petals. The ovary is superior, capsicular, and three-styled. Stamens are many, arranged in bundles of threes. The flowers are profuse, arranged in branched cymes which bloom from June until September. In the absence of insect pollination, apomixis (a state where a plant doesn't sexually reproduce, but self-pollinates, e.g., dandelion; reproduction by seeds without fertilization) commonly occurs.

St. John's Wort should not be confused with rose of Sharon (*H. calycinum*), a common ornamental ground-cover in the United States. Rose of Sharon flowers and leaves are much larger than those of St. John's Wort (though interestingly, antibiotic substances have been extracted from *H. calycinum* that are similar in activity to substances in *H. perforatum*).[3]

Range and Habitat

St. John's Wort is native to Europe, West Asia, North Africa, Madeira and the Azores, and is naturalized in many parts of the world, notably North America and Australia.[4,5] The plant spreads rapidly by means of runners or from the prodigious seed production and can invade pastures, disturbed sites, dirt roads, the sides of roads and highways, and sparse woods.

In the western United States, St. John's Wort is especially prevalent in northern California and southern Oregon, hence one of its common names, "Klamath Weed." Because of the known photosensitizing properties of the plant, which can be toxic to cows and sheep, it has been considered a pest in some places. Prior to 1949, it was estimated to inhabit 2.34 million acres of rangeland in northern California. For years an attempt was made to control the plant with herbicides,[6] but with little success. The solution to the problem finally proved to be with biological methods of control, not pesticides. In 1946, the leaf-beetles *Chrysolina quadrigemina* Rossi, and to a lesser extent *C. hyperici* Forst, were in-

troduced from Australia, where it had been observed that the beetles had a voracious appetite for *Hypericum*. Their appetite proved to be so voracious, in fact, that by 1957 northern California's stands of St. John's Wort were reduced to only 1% of their original number.[5]

Ironically, however, at the time of release of the *Chrysolina* beetles in California, it was not known that herbalists would one day keep *Hypericum* populations well under control through harvesting large quantities.

Some early Christian authors claimed that red spots, symbolic of the blood of St. John, appeared on leaves of* Hypericum *spp. on August 29, the anniversary of the saint's beheading...

Etymology of Nomenclature

The name *Hypericum* is ancient and may have several derivations. *Yperikon* was first mentioned by Euryphon, a Greek doctor from 288 BC.[7] Pliny called the ground pine *Hyperikon*, though also *Chamaepitys* and *Corion*.[8] One common explanation for the name *Hypericum* is that it may derive from *ereike* (heather) and *hyper* (above).[9] However, although one Greek species of *Hypericum* looked similar to heather (though it grew taller), it seems more likely that the name derives from *eikon* (a figure, possibly an unwanted apparition) and *hyper* (above), which relates to the ancient use of St. John's Wort to exorcise evil spirits or influences,[10] since the plant may have been placed over religious icons as a symbol of protection. Linnaeus, who described the genus, thought that *Hypericum* came from *yper* (upper) and *eikon* (an image).[11]

The common name, St. John's Wort, is obviously a reference to St. John. The use of this name may date back to the 6th century AD when, according to Gaelic tradition, the missionary St. Columba always carried a piece of St. John's Wort because of his great regard for St. John.[12] Some early Christian authors claimed that red spots, symbolic of the blood of St. John, appeared on leaves of *Hypericum* spp. on August 29, the anniversary of the saint's beheading, while others considered that the best day to pick the plant was on June 24, the day of St. John's feast.[10] In the Christian tradition, St. John represents light, hence the flowers were taken as a reminder of the sun's bounty.[13]

HISTORY OF USE

Dioscorides, the foremost herbalist of the ancient Greeks, mentions four species of *Hypericum—Uperikon, Askuron, Androsaimon*, and *Koris*—which he recommends for sciatica, "when drunk with 2 heim of hydromel (honey-water)." He also claims that it "expels many cholerick excrement, but it must be given continuously, until they be cured, and being smeared on it is good for ambusta (burns)." *H. crispum* and *H. barbatum*, he writes, have "a diuretical facility....and of moving ye menstrua. The seed being drunk for 40 days drives away tertians and quartans (fevers occurring every 3 or 4 days, possibly malaria).[14]

Common St. John's Wort
Hypericum perforatum,
from *Handbook of Plant and Floral Ornament*,
Richard G. Hatton, 1960

Theophrastus recommends *H. lanuginosum*, a Greek species, for external application, while Pliny says it should be taken in wine against poisonous reptiles. *H. coris*, another Greek species, was mentioned by Hippocrates and Pliny.[15] Although many older authors attest that the ancients knew of *Hypericum* as *Fuga daemonum* and used it to drive away demons, none make reference to any specific writers.[16] Dioscorides, Pliny, and Theophrastus do not mention either this name or this use of the plant, but herbalists from the 16th and 17th centuries commonly mention the name.

In the early humoral system of medicine, Galen considered *Hypericum* to be hot and dry, while Paracelsus wrote of the plant in the early 1500s that it could be used as an amulet against enchantments and apparitions.[17] St. John's Wort was used in early pre-Christian religious practices in England, and it has many legends written about it.[18] For instance, one belief was that bringing the flowers of St. John's Wort into the house on midsummer eve would protect one from the evil eye, banish witches, etc. Another belief was that if one slept with a piece of the plant under one's pillow on St. John's Eve, "the Saint would appear in a dream, give his blessing, and prevent one from dying during the following year."[17] The favor St. John's Wort enjoyed is well expressed in the following poem:[19]

St. John's wort doth charm all the witches away,
If gathered at midnight on the saint's holy day.
And devils and witches have no power to harm
Those that do gather the plant for a charm:
Rub the lintels and post with that red juicy flower;
No thunder nor tempest will then have the power

To hurt or to hinder your houses; and bind
Round your neck a charm of a similar kind.

Several noted English herbalists, reflecting the general beliefs of their time, wrote very favorably of the virtues of St. John's Wort. For instance, Gerard (ca. 1600) tells of the ointment he made of the plant as being a "most precious remedy for deepe wounds," and adds that "there is not a better natural balsam...to cure any such wound."[20]

"...it is a singular wound herb, healing inward hurts or bruises," and that as an ointment "it opens obstructions, dissolves swelling and closes up the lips of wounds."

Culpeper (ca. 1650), who was fond of ascribing astrological signs to medicinal herbs, says that *Hypericum* "is under the celestial sign Leo, and the dominion of the Sun." He goes on to say that "it is a singular wound herb, healing inward hurts or bruises," and that as an ointment "it opens obstructions, dissolves swelling and closes up the lips of wounds." Also, he claims it is good for those who "are bitten or stung by any venomous creature, and for those that cannot make water"—which use modern science confirms—and adds that the plant helps with "sciatica, the falling sickness and the palsy."[21]

Other early uses of *Hypericum* include as an oil (made by macerating the fresh flowering tops of the plant in oil and then placing them in the sun for two or three weeks), which was "esteemed as one of the most popular and curative applications in Europe for excoriations, wounds, and bruises."[22] This preparation was even used by the surgeons to clean foul wounds, and was official in the first *London Pharmacopeia* as *Oleum Hyperici*.[23]

Other popular folk-uses for St. John's Wort have included: as a decoction for gravel and ulcerations of the ureter;[24] for ulcerations of the kidneys, febrifuge, vermifuge, jaundice, gout, and rheumatism;[25] as an infusion (1 ounce of herb to 1 pint water) for chronic catarrhs of the lungs, bowels, or urinary passages; and as a warm lotion on injuries to the spinal cord, for lacerated or injured nerves, bedsores, and lockjaw.[26]

The native American Indians used several indigenous species of *Hypericum* as an abortifacient, antidiarrheal, dermatological aid, febrifuge, hemostatic, snake bite remedy, and general strengthener. After St. John's Wort was introduced by European settlers, they used it as well for similar conditions.[27,28]

As for the young United States, St. John's Wort was not well-known and was rarely mentioned by prominent writers on the subject of medicinal plants. One of the first references to the plant is from Griffith (1847), who says it can be used as an oil or ointment for ulcers, tumors, and as a diuretic.[29] Even the Eclectics, medical doctors from the late 1800s and early 1900s who favored herbs in their practice, did not use St. John's Wort much.

Nonetheless, King, in his *Dispensatory* (1876), mentions its use in urinary affections, diarrhea, worms, jaundice, menorrhagia, hysteria, nervous imbalances with depression, and its usual external applications, including the use of the saturated tincture as a substitute for arnica, in bruises.[30] In the later Felter-Lloyd revision of King's *Dispensatory*, tincture of St. John's Wort, in a dose of 10-30 drops mixed with 4 ounces of water, taken in teaspoonful doses every 1-2 hours, is prescribed for spinal irritation, shocks, concussions, puncture wounds, and hysteria.[31]

Today, modern American herbalists still use St. John's Wort for many of the same conditions for which it has been recommended throughout the ages.[32,33]

St. John's Wort, *Hypericum perforatum*
1. Pistil of 3 united carpels 2. Flowers 3. Capsule cut across, from *Botany for Young People and Common Schools*, Asa Gray, M.D., 1858

CHEMISTRY

The genus *Hypericum* has an exceedingly complex and diverse chemical makeup. *H. perforatum* has been the most intensively studied, but there are data available on 66 other species.[34] The compounds that have been identified from *H. perforatum* can be divided into several classes, which are summarized along with their pharmacological activity in Table 1. (*Ed note — Footnotes 35 - 83 appear in Table 1.*)

The hyperoside and tannin content of *H. perforatum* is higher at growth temperatures above 14 degrees C. (15.06% of dry weight) than below (13.42%). Both hyperoside and rutin content is higher in dry conditions (1.25% and 2.32% respectively) than wet conditions (no figure given and 1.89%, respectively). Hyperoside content is variable during the day and is highest at 7 p.m.[84] Total tannin content is highest when the buds are forming, just prior to flowering, in June.[85,86]

Higher amounts of flavonoids, including rutin, quercetin, and hyperoside occur in plants of northern slopes with few generative shoots.[87] Flavonoid content (rutin, hyperin, quercetin, and quercitrin) is highest in the leaves of St. John's wort, and is at maximum concentration during full bloom. In the flowers, the content of flavonoids is highest at the start of flowering, falling sharply during flowering.[88]

St. John's Wort (flowers) had the highest content of flavonoids (11.71%) of any of 223 species tested.[89]

St. John's Wort
Hypericum perforatum L.
A, Habit — x 0.5; B, enlarged leaves — x 1.5
from, *Common Weeds of the United States*,
U. S. Department of Agriculture, 1970

Table 1. Summary of Constituents and Activities of *Hypericum perforatum*

Constituent & References	Activity & References
Dianthrone derivatives (35, 36, 37) hypericin, pseudohypericin, frangula-emodin anthranol (and a mixture of the precursors, proto-hypericin & hypericodehydrodianthrone)	(38, 39) photodynamic, antidepressive (MAO inhibitor), antiviral
Flavanols (40, 41) (+)-catechin (+ polymers: condensed tannins), leucocyanidin, (-)-epicatechin (total tannin content is 6.5-15%)	(42) astringent, anti-inflammatory, styptic, antiviral
Flavonols (43 - 49) hyperoside (hyperin), quercitin, isoquercetin, rutin, methylhesperidin, iso-quercetrin, quercitrin, I-3/II-8-biapigenin, kaempferol	(50-54) capillary-strengthening, anti-inflammatory, diuretic, cholagogic, dilates coronary arteries, sedative, tumor inhibition, antitumor, antidiarrheal
Xanthones (55) xanthonolignoid compound (roots)	56-58) generally, xanthones exhibit antidepressant, antitubercular, choleretic, diuretic, antimicrobial, antiviral and cardiotonic activity
Coumarins (59) umbelliferone, scopoletin	-- —
Phenolic carboxylic acids (60,61) caffeic acid, chlorogenic acid, gentistic acid, ferulic acid	—
Phloroglucinol derivatives (62-64)	(65) anti-bacterial (*Staphylococcus aureus*)
Essential oil components (68,69) **Monoterpenes** (34, 35) (small amounts—0.05-0.3%); alpha-pinene, beta-pinene, myrcene, limonene **Sesquiterpenes** (70) caryophyllene, humulene	(67) the physiological activity of mono- and sesquiterpenes are reviewed elsewhere; (66) *H. perforatum* essential oil is antifungal
n-Alkanes (71,72) methyl-2-octane, n-nonane, methyl-2-decane, n-undecane, all in the series C_{16}-C_{29}, (especially nonacosane)	--
n-Alkanols (73) 0.43% of total dried herb: 1-tetracosanol (9.7%), 1-hexacosanol (27.4%) 1-octacosanol (39.4%), 1-triacontanol (23.4%)	(74-80) health products including octacosanol are sold in Japan and the U.S. as "metabolic stimulants" (Japanese studies show it stimulates feeding of silkworm larvae; studies with neurological disorders (Parkinson's, ALS, MS) show mixed results
Carotenoids (81) epoxyxanthophylls	(82) available oxygen in xanthophylls may explain burn-healing activity
Phytosterols (83) Beta-sitosterol	--

St. John's Wort, Klamath Weed *Hypericum perforatum.* 1. plant in flower; 2. portion of stem with leaves; from *Weeds of North Central States,* Univ. of Illinois, 1971

PHARMACOLOGY

Extracts of the flowering tops of *Hypericum perforatum* have shown a variety of effects in the laboratory, including psychotropic activity, wound- and burn-healing activity, bactericidal effect against pathogens in pyelitis and cystitis, antiviral effects, sunscreen activity (disputed), antidepressive activity, and diuretic, anthelmintic, and mildly uterotonic activity.[90, 91, 92] Although much more work needs to be done to validate the use of St. John's Wort, there are a few laboratory studies which corroborate its use for some of these conditions and point the way for further research.

Following is a summary of the laboratory work that has been conducted on the pharmacological effects of St. John's Wort extract or oil.

Anti-depressive and Psychotropic Activity

Three of the most common psychological illnesses today are depression, bipolar affective disorder, characterized by swings between depression and mania), and(schizophrenia. One of the best-known (but controversial) theories hypothesizes that depression is caused by deficiency or decreased effectiveness of norepinephrine and serotonin, acting as nerve impulse transmitting substances (neurotransmitters), in particular nerve pathways. One method for treating depression uses the monoamine oxidase (MAO) inhibitors which retard one of the enzymes responsible for monoamine (a precursor) breakdown, increasing the concentration of neurotransmitters in the central nervous system.[93, 94]

Because of St. John's Wort's history of use for psychiatric conditions, it was tested for MAO-inhibiting activity. Suzuki *et al.* (1984), in an international effort, first demonstrated that xanthones, common in the Guttiferae (the family of St. John's Wort) and the Gentianaceae (Gentian family), inhibit both type A and B monoamine oxidase. Among these is the compound isogentisin, which has been found in some species of *Hypericum*, but not *H. perforatum*.[95, 96] A further study by the same group found that hypericin from *H. perforatum* irreversibly inhibits type A and B MAO *in vivo*. The authors stress, however, that although this study is suggestive, no definite conclusion can be drawn yet regarding St. John's Wort's antidepressant activity.[97]

A standardized (hypericin) extract ...has been found to enhance the exploratory activity of mice ...and decreased aggressive behavior in socially isolated male mice.

A standardized (hypericin) extract of *H. perforatum* has been tested in various animal models generally used for determining antidepressant activity, and has been found to enhance the exploratory activity of mice in a foreign environment, extended the narcotic sleeping time dose-dependently, and has shown reserpine antagonism and decreased aggressive behavior in socially isolated male mice.[98]

Muldner and Zoller (1984), in a clinical trial with 6 depressive women, 55-65 years old, measured metabolites of noradrenaline and dopamine in the urine, and found that after taking a standardized hypericin extract, there was a significant increase in 3-methoxy-4-hydroxyphenylglucol, a marker for the beginning of an antidepressive reaction. The same research team, working with 15 women taking a standard hypercin extract, demonstrated an improvement in symptoms of anxiety, dysphoric mood, loss of interest, hypersomnia, anorexia, depression (worse in the morning), insomnia, obstipation, psychomotor retardation, and feelings of worthlessness. They reported no side effects.[99]

Wound and Burn Healing

In a number of studies St. John's Wort extracts have demonstrated antibacterial and wound-healing activity. For instance, two widely prescribed Russian preparations of *Hypericum*, Novoimanine and Imanine, have been tested for *Staphylococcus aureus* infection *in vivo* and *in vitro*, and been found to be more effective than sulfanilamide[100, 101, 102]. Hyperforin, a bicyclic tetraketone from *H. perforatum*, is reported to be a main antibiotic constituent of Novoimanine.[103]

One German patent mentions that an ointment containing an extract of St. John's Wort flowers shortened healing

time of burns and showed antiseptic activity.[104] According to the report, first degree burns healed in 48 hours when treated with the ointment, while second and third degree burns healed without keloid (a type of scar tissue) formation three times faster than burns treated by conventional methods.

Further studies reported that a freeze-dried St. John's Wort extract suppressed inflammation and leukocyte infiltration *in vivo*,[105] and that St. John's Wort oil has been used in commercial products as a sun screen. However, reports of its efficacy in this latter regard are contradictory.[106, 107]

Antiviral Effects

International interest increased in St. John's wort after researchers from New York University medical center and the Weizmann Institute of Science in Israel demonstrated that two compounds from the plant strongly inhibit a variety of retroviruses *in vitro* and *in vivo*.[108] Several points bear citing from their report:

- "When the compounds interact with the infecting particles shortly after *in vivo* administration, disease is completely prevented."
- "Preliminary *in vitro* studies with pseudohypericin indicate that it can reduce the spread of HIV."
- The total yield of hypericin and psuedohypericin from *H. triquetrifolium* Turra was 0.04%.
- The compounds were still effective when administered orally or i.p. within 1 day of infection.
- No serious toxic side effects were noticed after testing over 800 mice with the compounds. Administration of the compounds did not result in abnormalities in any of a wide variety of clinical tests performed on the animals.
- Hypericin shows toxicity to some human cells at very high concentrations (>10 µg/ml, or lower for some cell types). Pseudohypericin is less toxic. Fortunately, the compounds show remarkable antiviral potency "after one administration of a relatively small dose of the compounds."
- "The compounds directly inactivate the virions or interfere with assembly or shedding of assembled viral particles."
- "The compounds can cross the blood-brain barrier" (important for HIV infection).

One word of caution, however: although *Hypericum* extracts appear promising for the treatment of retroviral infections, including HIV, it must be stressed that there has been no clinical evidence of its efficacy in humans to date (i.e., for HIV infection), and several questions remained unanswered. For instance, there is no information about the concentration needed for efficacy, even if the compounds are effective in HIV infection in humans. Furthermore, if a large concentration is effective, is it close to the photosensitizing dose? Also, it must be pointed out that the total content of these two compounds in *Hypericum* is quite low (dried *H. perforatum* has been reported to contain 0.24% hypericin).[109] Consequently, a standardized extract (to hypericin content) may be the surest way to administer the plant for viral therapy.

CLINICAL APPLICATIONS

Clearly, the potential scope of clinical application of St. John's Wort is extensive. However, if one narrows the focus down to those activities that are most mentioned, such as antibacterial, antiphlogistic, diuretic, and antidepressive, specific clinical applications become more restricted.

In modern European medicine, St. John's Wort extracts are included in many over-the-counter and prescription drugs for mild depression, and have clinical application for bedwetting and nightmares in children. The extract is included in diuretic preparations, and the oil is taken internally by the teaspoon to help heal gastritis, gastric ulcers, and inflammatory conditions of the colon (using a retention enema).[110] The oil is also used extensively in burn and wound remedies, externally.

Table 2, taken from the German Health Department's official monograph on St. John's Wort (1984), summarizes the current clinical applications of the plant.[105,106]

Table 2. Clinical Indications for St. John's Wort

Herb source: flowers of *Hypericum perforatum*, gathered during the time of blooming or of the dried parts above the ground, as well as their preparations, in effective dosages.

Clinical applications: *Internally*: psychovegetative disturbances, depressive states, fear and/or nervous disturbances. Oily hypericum preparations during dyspeptic disturbances. *Externally*: Oily hypericum preparations for the treatment or after treatment of sharp or abrasive wounds, myalgias (muscular pain) and first degree burns.

Contraindications: None known.

Side effects: Photosensitization is possible, especially in fair-skinned people.

Interference with other drugs: None known.

Dosage schedule: Average daily dose recommended is 2-4 grams of the powdered herb as a powdered extract, equivalent to .02-1.0 g hypericin.

Method of use: Cut or powdered plant, liquid and solid forms for oral administration. Liquid and semi-solid forms for external use.

Effects: Mild antidepressant action (monoamine oxidase (MAO) inhibitor), oily preparations have antiphlogistic activity. Diuretic activity...direct effect on smooth musculature.

St. John's Wort
Hypericum
from, *The Herbal*,
John Gerard, 1633

TOXICITY

Besides its long history of use as a medicinal plant, St. John's Wort is also known as a photosensitizing plant that can cause sickness and even death in grazing animals (when large amounts are eaten), particularly cattle, sheep, horses, and goats, but also rabbits and rats.[111] This toxic activity of St. John's Wort was first noted in the literature by Cirillo (1787), and since then, there have been many papers published concerning this effect, and the effect mentioned numerous times.[112] The plant, however, does not seem to be a major threat to livestock, because the first symptoms of *Hypericum* intoxication includes loss of appetite, which makes the absorption of the photodynamic pigment, hypericin, self-limiting.[113]

In the case of *Hypericum* toxicity, the compound hypericin is absorbed from the intestine and concentrates near the skin. When the skin of the animal is exposed to sunlight, an allergic reaction takes place. Oxygen is necessary for the photodynamic hemolysis, leading to tissue damage. In the absence of sunlight, a reaction will not occur, and the compound does not show particular toxicity.[114, 115] This first type of reaction is called 'primary photosensitization'.[116] Another, more serious type is secondary photosensitization, where the liver and other internal organs can be damaged.[117]

Cattle appear to be more sensitive to the phototoxicity of hypericin than sheep. In one test with cattle, a single dose of 1 g per kg bodyweight of dried *Hypericum* showed no photosensitization or changes in liver enzymes, but 3-4 g did. If humans were as sensitive to hypericin as cattle, this dose would correlate to 59 g for a 130 lb individual. Additionally, hypericin does not seem to be accumulative.[118]

Although there have been a considerable number of studies published demonstrating the phototoxicity of hypericin in various animal species[119, 120] a thorough search by this writer brings to light no evidence that there has ever been a case involving human toxicity.

The FDA declared *Hypericum perforatum* an unsafe herb...apparently...on the basis of its reported toxicity to cattle, and not based on any reports or studies on human toxicity.

Some authors recommend caution when using large quantities of St. John's Wort extract for medicinal uses, particularly for people with fair skins, who should not expose themselves to strong sunlight during *Hypericum* therapy.[121] Judging by the available literature, a very moderate dose, up to 4 g of the dried herb, 30 ml of the 1:5 tincture (40% EtOH), or 240 grams of the 1:5 powdered extract per day (standardized to 0.125% hypericin), should not pose a problem, if sunlight restriction is followed,[122, 123] especially given the widespread use of *H. perforatum* extracts in Europe. One major product is recommended by the manufacturer to be taken as 40 mg tablets (1-2 tablets, 3 times a day).

The Food and Drug Administration (FDA), which regulates the sale of foods and drugs, with respect to their safety, purity and efficacy, declared that *Hypericum perforatum* was an unsafe herb, in its list of 27 "unsafe herbs" (1980).[124] The herb was apparently included in the list on the basis of its reported toxicity to cattle, and not based on any reports or studies on human toxicity. In an earlier regulatory statement by the FDA (Jan. 30, 1965), under "Food additives permitted in food for human consumption," St. John's Wort was included, proposing that it be granted safe status as a natural flavoring agent, and asking for comments. This action was subsequent to a petition filed by the International Vermouth Institute, as an extract of the plant had been used in making various alcoholic beverages, including vermouth. After comments were reviewed, it was concluded that there is not enough information to grant "Generally recognized as safe" (GRAS) status, but an alcoholic, hypericin-free extract was approved for use in alcoholic beverages only.[125]

PREPARATIONS

Hypericin was more effectively extracted with glycol and sunflower seed oil when the moisture content of the herb was between 50 and 70%, and 2-7 times higher at 70° than at 20°. The menstruum was saturated after 12 hours and 24 hours respectively, but it took 3-4 extractions to exhaust the herb.[126] The total extraction in one hour of hypericin with

ethanol was not dependent on water content of the herb. The authors conclude that ethanol is the most suitable menstruum for the extraction of dried material.[127]

Freshly air-dried herb was moistened to 70-72% moisture and extracted at 70° C. at 1:7 with sunflower seed oil. The total content of hypericin was 2.5 mg%, and extracting the marc with ethanol could increase the content to 3.32 mg% (a 25% increase).[128]

Hypericin content of a juice of *H. perforatum* and a powdered extract dropped by 14% during 1 year, and the dry extract remained stable, when stored at 20° C. When stored at 60° C, the hypericin content dropped 33%, 33%, and 47% from a powdered extract, tablets, and liquid juice, respectively.[129]

In one extensive study, up to 80% of the hypericin was destroyed by drying the fresh plant in sunlight.[130] For this reason, modern herbalists generally grind the fresh tops of *Hypericum* and immediately macerate them in olive oil or sunflower seed oil. The oil is then pressed and filtered after two weeks, and should be stored in amber bottles away from heat and light. An alcoholic tincture is made in the same way, macerating the fresh, ground tops in a mixture of 70% ethyl alcohol and 30% distilled water.

St. John's Wort is currently official in the pharmacopeias of Czechoslovakia, Poland, Romania, and the Soviet Union.[131]

IDENTIFICATION AND ADULTERATION

For identification of cut and sifted material from the commercial drug market, note the two opposite ridges on the stems. These are prominent, and an important character in differentiating *Hypericum* species (see illustration, page 27). Ideally, the commercial drug should consist mostly of flowering tops, but in common practice the whole above ground plant with a considerable quantity of stem may be present. Flowers should consist of 70-90% (or more) immature capsules, otherwise the plants may have been harvested too late in the season. The hypericin content declines immediately after anthesis (flower maturity and pollination).

The leaves, when observed with a 10X hand lens, should be characterized by many punctate glands, clearly distinguishable by holding them up to a light source. The flowers will all contain fragments of the persistent dried petals, which may have red glands (appearing black) around the perimeter.

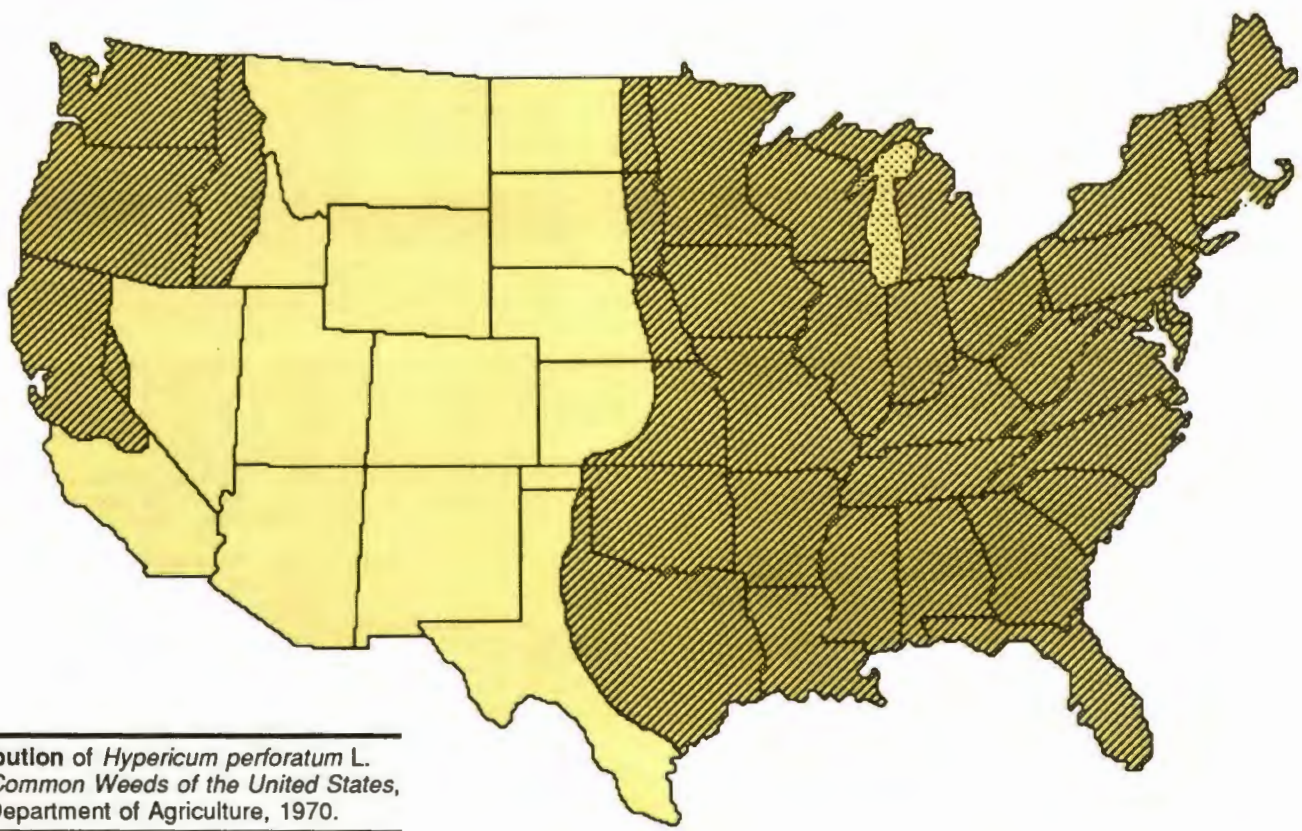
The taste (and smell) of St. John's Wort is characteristically slightly sweet, bitter, and astringent. A commercial oil or tincture of *Hypericum* should be vivid, almost fluorescent red. If the preparation is pale red to pink, the hypericin content, and thus the quality of the product, is suspect.

Several methods are given in the literature for the TLC and HPLC identification of hypericin, [132-140] and Katalin *et al.* (1982) report on the histological examination of St. John's Wort leaves.[141]

Since tannins play a role in the therapeutic action of St. John's Wort extracts, standardization with this fraction has been recommended (liquid extract containing 1% tannins).[142]

LITERATURE

Review: An earlier review (1969) covers the history, development and photodynamic effect, chemical constituents, synthesis of hypericin, pharmacology and uses with 127 references.[143]



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Native American Medicinal Plant Stamps

Imagine that you can walk into your local post office and buy a commemorative stamp series of beautiful colorful plants. These would include such favorite herbs as Goldenseal, Echinacea, and Evening Primrose, plus medicinal trees like Slippery Elm, Willow, and Witch Hazel.

A project to have such a series issued started with Barbara Downs, an herb grower in Oklahoma. Downs presented it to the International Herb Growers and Marketers Association (IHGMA), an organization of herb growers, which has adopted the project. The American Herbal Products Association (AHPA), an organization composed of many leading herb manufacturers and distributors, has adopted a resolution in support of the project and is sending petitions and related materials to all of its members.

Of course the idea of a series of stamps of specific plants is not new. The U.S. Postal Service has, from time to time, issued plant pictures, usually flowers. What is novel and exciting about this proposed issue is that all fifty proposed plants have previous or currently employed value as medicinal herbs. This list was prepared by noted USDA Botanist James A. Duke, a prolific author on the subject of medicinal plants in both technical journals and the lay press, and Steven Foster, a botanist and author who has written widely about Native American plants (especially Echinacea) and Chinese herbs.

Many European countries have issued medicinal plant stamps. Emory E. Cochran, Ph.D., describes 42 herbs that are depicted in a series of medicinal plant stamps from Yugoslavia in 1963 in his volume *Philatelic Therapy* (1964). There is a black and white picture of the stamp and a two-page article on each herb. Plants included are Chamomile, Valerian, Primrose, Marigold, Hyssop, Sage, and St. John's Wort. The book covers interesting information on each plant, such as the reason and meaning behind the Latin names, mythological references to the herb, and historical folk medicine uses. It would be highly educational if the proposed U.S. series were to be accompanied by a similar book using the same artwork in the stamps. Hopefully, this book would be in color!

A mass mailing of letters and petitions to the U.S. Postal Service from organizations and individuals supporting the proposed project will allow the Post Office to issue a series of commemorative postage stamps depicting colorful renditions of Native American plants that have been used by Native Americans and/or early settlers as medicines.

HerbalGram readers have an excellent opportunity to support a project that will have deep impact and lasting effect in promoting appreciation of Native American medicinal plants.

Write a letter on your personal, company, or organization letterhead to the U.S. Postmaster General urging the Post Office to adopt the Commemorative Medicinal Plant Stamp Project. Get others in your network to write similar letters or sign a petition indicating support for this project. Send your letters and petitions NOT to the Post Office directly, but instead to the International Herb Growers and Marketers Association, Attention Maureen Buerhle, P.O. Box 281, Silver Springs, PA 17575. Phone 717/ 684-9756.

You, your company, or organization could add further support with a small donation to the IHGMA to help defray administrative costs for the project. The total budget is only $1200 (mailing, copies, stamps, etc.,) so even a small donation will be appreciated.

One more note: The Postal Service cannot consider issue of stamps for a commercial product. It is important to emphasize that this is not what the stamps are about. However, as people who are already aware of the historic value of native American plants, members of the natural food and herb industries as well as members of garden clubs, botanical and native plant societies, and health professions need to support and promote adoption of this idea.

You must act now. The original deadline was mid-November 88. The Postal Service has extended the deadline in order to network more people and create more impact, resulting in a greater likelihood of favorable response in the realization of this unprecedented opportunity for educating the American public about herbs.

Native American Medicinal Plant List for Commemorative Stamp Proposal

Birthroot (Purple Trillium), *Trillium erectum*
Black Cohosh, *Cimicifuga racemosa*
Black Haw, *Viburnum prunifolium*
Blue Cohosh, *Caulophyllum thalictroides*
Bloodroot, *Sanguinaria canadensis*
Boneset, *Eupatorium perfoliatum*
Butterfly Weed (Pleurisy Root), *Asclepias tuberosa*
California Poppy, *Eschscholzia californica*
Cardinal Flower, *Lobelia cardinalis*
Chaparral, *Larrea tridentata*
Cowparsnip, *Heracleum maximum*
Cranesbill, *Geranium maculatum*
Culver's Root, *Veronicastrum virginicum*
Echinacea (Coneflower), *Echinacea purpurea* and *angustifolia*
Elder, *Sambucus canadensis*

Evening Primrose, *Oenothera biennis*
Field Mint, *Mentha arvensis*
Ginseng, *Panax quinquefolius*
Goldenrod, *Solidago odora*
Goldenseal, *Hydrastis canadensis*
Indian Tobacco, *Lobelia inflata*
Large Cranberry, *Vaccinium macrocarpon*
Lady Slipper, *Cypripedium calceolus*
May Apple, *Podophyllum peltatum*
Mistletoe, American, *Phoradendron flavescens*
New Jersey Tea, *Ceanothus americanus*
Oregon Grape, *Berberis aquifolium (Mahonia)*
Oswego Tea, (Bee balm), *Monarda didyma*
Passionflower, *Passiflora incarnata*
Pipsissewa, *Chimaphila umbellata*
Pokeweed, *Phytolacca americana*
Prickly-pear Cactus, *Opuntia compressa*
Saw Palmetto, *Serenoa repens*
Self-heal, *Prunella vulgaris*
Seneca Snakeroot, *Polygala senega*
Skullcap, *Scutellaria lateriflora*
Spicebush, *Lindera benzoin*
Spikenard, *Aralia racemosa*
Sumac, *Rhus glabra*
Sunflower, *Helianthus annuus*
Sweet Flag, *Acorus calamus*
Wild Ginger, *Asarum canadense*
Wild Senna, *Cassia marilandica*
Wild Yam, *Dioscorea villosa*
Wintergreen, *Gaultheria procumbens*
Wormseed, *Chenopodium ambrosioides*
Yarrow, *Achillea millefolium*

Trees

Black Cherry, *Prunus serotina*
Cascara Sagrada, *Rhamnus purshiana*
Persimmon, *Diospyros virginiana*
Sagebrush, *Artemisia tridenta*
Sassafras, *Sassafras albidum*
Slippery Elm, *Ulmus rubra*
Sweet Gum, *Liquidambar styraciflua*
Trembling Aspen, *Populus tremuloides*
White Pine, *Pinus strobus*
Willow, *Salix nigra*
Witch Hazel, *Hamamelis virginiana*

Note: This plant listing was done in consultation with several botanists and herbalists and an extensive list of written references. When two plants were of similar importance, weight was given to their suitability as stamp material: color, shape, etc. A bibliography of references used in compiling this list is available by request. More than 50 herbs are listed in order to give the artists some choices.

Flora of China Translation Becomes International Effort

The Missouri Botanical Garden has been designated the organizational center for an international effort to translate the *Flora of China* into English. The editorial committee for the project met at the Garden in October to discuss a plan of action.

The editorial committee is co-chaired by Garden Director Dr. Peter H. Raven. Dr. William Tai, formerly Professor of Cytogenetics at the University of Manitoba, has been hired by the Garden to coordinate the project. Other editorial committee members include Dr. Bruce Bartholomew from the California Academy of Sciences, Dr. David E. Boufford, from the Harvard University Herbaria, Dr. Nancy Morin from the Garden, and seven scientists from the People's Republic of China.

Completion of the English translation of the *Flora of China* — a complete listing of the plants of that country — is expected to take 12-15 years. Chinese scientists will do most of the translating, with Tai and the Garden being responsible for editing the final product. Data from the project will be entered in the Garden's computerized data base. The translation will be published in twelve volumes.

The Missouri Botanical Garden is also coordinating the Flora of North America project. Under Morin's direction, that project will produce an all-encompassing flora of all vascular plants growing without cultivation in North America north of Mexico.

Crop Diversification Essential

Speaking at the First National Symposium on New Crops at Purdue University in October 1988, Dr. Noel Vietmeyer of the National Academy of Sciences (Washington, D.C.) spoke of the need for diversification of agricultural crops.

"We have vulnerable economic systems because they are too dependent on one crop," he said. "We have overproduction and low prices because in some places we have produced too few crops. There are at least 3,000 tropical fruits, and we use only four substantially. There are 20,000 species of grasses. We use only seven or eight in an intensive way...There are 18,000 legumes that are remarkably resilient and nutritious. We only use six intensively...There are 60,000 medicinal plants but only a couple of new pharmaceuticals."

Dr. Vietmeyer reported that most of our present foods are only 400 to 500 years old. The discovery of the New World opened up new possibilities as foods for Europeans. "It is clear that we will rely on a totally different mix of species in the future for food," he told the audience of over 400. "This is the best time in history for diversity of food. For the first time the whole world's diversity of foods is coming available." (*The Herbal Seeker*, Vol. I, #6, Dec/Jan88/89.)

Herbal Seeker to Merge with Digest

The *Herbal Seeker*, a bi-monthly newsletter on herb marketing and production by Laura Clavio, formerly co-ordinator of the three Purdue Herb Conferences, is merging with *The Herb, Spice, and Medicinal Plant Digest*. The Digest is published by the Co-operative Extension Service of the University of Massachusetts at Amherst. The proposed merger is expected to be effective in the Spring of 1989. Prospective subscribers should contact Dr. Lyle E. Craker, Dept. of Plant and Soil Sciences, Stockbridge Hall, Univ. of Mass., Amherst, MA 01003.

The New Honest Herbal

Varro E. Tyler, Ph.D. 1987. George F. Stickley Co., 210 W. Washington Sq., Philadelphia, PA 19106. 254 pp. $18.95. Softcover.

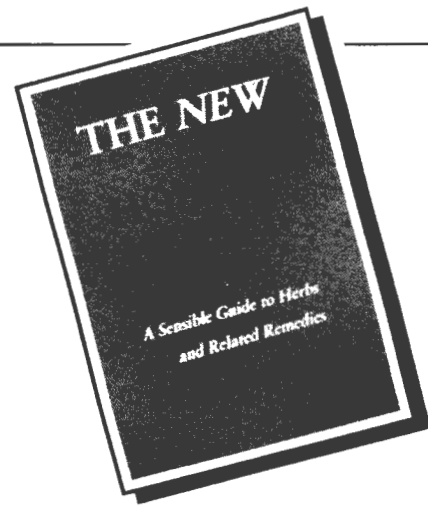
A review of this book in *HerbalGram* is frankly long overdue. A previous version of this article was written over a year ago (at that time I was going to call it "An Honest Review of *The New Honest Herbal*"), but I was never quite satisfied with my own assessment of the book. At that time, my initial article was more critical of Tyler's volume—possibly a reaction to what I, at that time, considered to be the author's own overly critical or at least highly "conservative" position about herbs.

In the meantime, I have found myself using this book more and more as one of the ten or twelve volumes in my library used most often for reference. After all, a man of Professor Tyler's position and importance in the scientific community cannot be overlooked. (He is the co-author of several editions of the textbook *Pharmacognosy*, reviewed in *HerbalGram* #16, and numerous scientific articles.)

It is because of his background and acceptance that this book and its predecessor have become one of the most often quoted or referred-to herb books published in the last ten years. I am certain that some of my botanist and writer friends share the same thought when researching an article: "I wonder what Tyler says about this herb?"

The Honest Herbal was initially published in 1982. It was an attempt by the author, then Dean of the School of Pharmacy at Purdue University (he is now Executive Vice-President), to provide accurate ("honest") information about some of the more popular herbs. This in a marketplace where numerous herb books were being printed, often containing what he called "inaccurate and deceptive information."

The publication of *The Honest Herbal* was not well received by some members of the herb and natural food communities who thought that Tyler's treatment of many popular herbs was unduly judgmental, negative, and possibly even harsh. In the book's preface Tyler anticipated such a reaction, especially when "compared to the writings



of most modern herbalists." He later wrote in a European journal that the herb and natural food industries did not accept his book presumably due to its critical tone. This may have some truth to it. I suspect the relatively high price tag ($18.95 for a 250-plus page paperback is "pricey" to say the least; the previous version was available only in hardback for about $26) as well as the publisher's apparent lack of marketing effort in these areas are equally responsible for lackluster sales in these markets.

...botanist and writer friends share the same thought when researching an article: "I wonder what Tyler says about this herb?"

In my opinion, herbalists and members of the natural food industries should purchase this book, if for no other reason than to afford themselves the perspective of balance. What Tyler is offering is an acknowledgedly conservative, yet scientific, approach to looking at the reputed properties of many popular herbs. The book is able to deal with only about 120 herbs and natural substances, and even here the critical reader might wonder why such health food items as bran, New Zealand green lipped mussel extract, pangamic acid (vitamin B15), l-tryptophan, and hive products like honey, pollen, propolis, and royal jelly would be included in an "herbal." The probable answer is that the author is attempting to deal with numerous popular natural products used by people attempting to self-medicate.

The book is set up as a series of short one- and two-page monographs on each herb. These appear in paragraph form, often beginning with a short quote from some literary source. Tyler offers a bit of background on each plant, sometimes some of the botany, a brief statement of the reputed folk uses, with a non-technical discussion of the plant's chemistry and pharmacology. Then he offers his own evaluation of the plant's real or mythical properties. It is in this area where many of Tyler's critics take issue.

Several herbalists with whom I have spoken have wondered whether Tyler merely reads and studies the plants that he writes of, or whether he actually uses them himself? This is often one of the major distinctions that separate the Sheep Sorrel from the Goat's Rue, as far as practicing herbalists are concerned. But that may be missing the point here. What Tyler is offering is evaluation based on "authoritative" scientific references—not history and hearsay. Tyler is looking for what is *scientifically* verifiable ("Varrofiable?"), that is, according to controlled studies that conform to the scientific method.

In this area, unfortunately, he is also subject to criticism. In his treatment of "Ginseng and related drugs" (one of the longer passages in the book), he states, "Nothing about ginseng seems to be totally free from controversy. Most of the literature in this area is based more on superstition and subjective opinion than on objective, scientific evidence." He then goes on to cite the infamous Siegel study that was published in the *Journal of the American Medical Association* (79) discussing the so-called "ginseng abuse

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Health and Healing

By Andrew Weil, M.D. 1983, Houghton, Mifflin Co., Boston, MA 02108. 296 pp. $8.95 paperback.

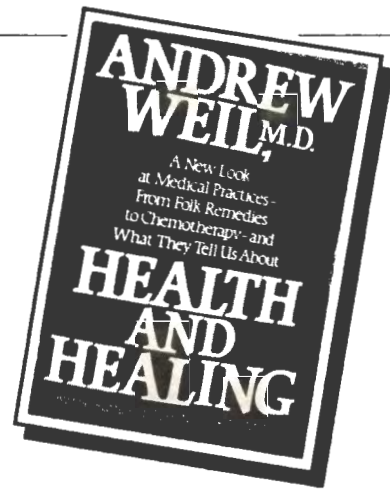
This is one of the most informative books to be published in the past ten years on the subject of "alternative" medicine. Originally published in 1983, it has just been reissued in a revised edition.

Even though it is not an "herbal," it is nevertheless one of my favorite books on the subject of the state of medicine in the late 20th century.

The book does contain information about some herbs, especially those medicinal plants that have been used in the materia medica of conventional medicine in the past hundred years or so: coca, ephedra, and digitalis as examples. Weil presents an excellent introductory lesson into some of the basic principles of pharmacology with a cogent argument for benefits of the use of whole plants and/or their extracts over their pharmaceutically isolated "active ingredients."

For example, his discussion of the toxicological aspects of digitoxin and digoxin (commonly used heart medications from the Foxglove plant (*Digitalis purpurea*) is a lesson that many physicians could take to heart (pun intended). Weil shows that the whole digitalis leaf acts more slowly and has less potential for toxicity, despite the common medical criticism that whole plant materials vary in the levels of "active" principles. This distinction is important, but it is worth noting that digitalis is not an herb sold in the herb and health food markets; its use is strictly pharmaceutical.

An interesting historical footnote is that digitalis became a favored heart remedy only after 1775 when British physician William Withering was persuaded by his wife to visit a woman herbalist to find a cure for dropsy (now referred to as dependent edema), a condition of accumulation of fluids in the legs with large swelling in the feet and ankles. Weil says that before this time digitalis was employed only by women herbalists because physicians refused to condescend to talk to these "old wives." The old women herbalist recommended digitalis leaf for the dropsy condition, knowing that it stimulated the heart's pumping action. Dropsy, it was later



learned, resulted from a weak heart that could not pump adequately, causing an accumulation of fluids in the lower extremities.

But interesting as his treatment of herbs is, Dr. Weil discusses herbs within the context of a much broader conversation: the development of modern medicine over the past several hundred years, and those alternative or competing modalities that have arisen to challenge medicine along the way.

Dr. Weil discusses herbs within the context of a much broader conversation; the development of modern medicine.

In this sense, *Health and Healing* offers a recent historical panorama of medicine, seen through the eyes of a dedicated student and practitioner of the healing arts who has a serious training in botany and botanical medicine. Andrew Weil has a working knowledge of botany, ethnobotany, and plant pharmacology that is vastly superior to most of his medical colleagues.

There is a good reason why Dr. Weil is so conversant in the area of medicinal plants. He spent his undergraduate years at Harvard studying under the internationally famous and respected ethnobotanist Richard Evans Schultes. Schultes has spent over 17 years living in the Amazon rain forests studying the ethnic uses of plants for medicines by native peoples. Weil went on to obtain his medical degree but his botanical training under Schultes left an indelible imprint on him. Weil wrote the best-selling *The Natural Mind* in the 70s, a book about the use of licit and illicit drugs approached from a new perspective. That book was followed by the controversial *From Chocolate to Morphine*, a sourcebook of psychoactive drugs that attempts to hold a rational discussion about the human propensity to use, misuse, and abuse various plant products whether used as foods or drugs.

Since much of *Health and Healing* deals with "alternative" medicine, it is important to note that herbs are not an alternative to modern medicine. Herbs have always been an important part of the history and development of medicine, from its early beginnings to modern times. Even today, it is estimated that 25 percent of all prescription drugs are derived from higher plants.

Weil is willing to use whatever methods and remedies that are appropriate for the situation and the patient. He is not bound by ideology or dogma as an M.D.; his concern, like most of his medical colleagues, is for the welfare of the patient. He admittedly adheres to numerous "allopathic" techniques where he deems them appropriate. Weil has found a comfortable middle ground in his medical practice. He uses botanical remedies with four out of five of his patients in his clinical practice. He also uses other modalities as well, including Oriental medicine. As a sidenote, Dr. Weil is on the faculty of the University of Arizona Medical School in Tucson.

This book provides an excellent overview of alternative medicine in these trying times. Weil's view is critical; he does not accept all alternative modalities *a priori*. For example, while he is willing to concede that chiropractors can be excellent physical therapists, he does not accept their general

See Healing, page 42

Natural Products Medicine:

A Scientific Guide to Foods, Drugs, Cosmetics

By Ara Der Marderosian, Ph.D., and Lawrence Liberti, M.S. George F. Stickley Co., 210 W. Washington Sq., Philadelphia, PA 19106. 1988. Soft cover, xi, 388 pps. $39

This book is born of the authors' perception of the frustration experienced in the medical community and the public in obtaining factual information about natural products used in medicine. It combines pharmacological and botanical information with a clinical approach to provide the health-care professional with a *vade mecum* (handbook; constant reference).

The book is divided into two main sections. The first, consisting of nine chapters, contains general discussions of major topics and one major chapter organized by chemotaxonomic class and pharmacological system. This section is preceded by three chapters and a preface. The preface has some ill-defined definitions of various modalities of alternative medical treatments. Bonafide practitioners of naturopathic medicine, licensed in eight states, for example, will take issue with the definition of "Naturopathy." Some confusion is developed here. In one breath the authors tell health-care professional they must approach medical "unorthodoxies" with an open mind, yet a few sentences later the best stance becomes "informed skepticism."

Chapter 1 - "Pharmacognosy Today" provides a fine overview of modern medicine's use of natural products . It will effectively convince health-care providers that herbs as such are not throw-backs to the Dark Ages, but an integral part of modern health-care.

Chapter 2 - "Classification of Natural Products" provides good background for understanding how organisms are arranged by taxonomists and the relative significance of classification for the health-care provider.

Chapter 3 - "Economic and Phytogeographic Considerations of Plants" covers economic and phytogeographic considerations of plants. While the economic aspects are well covered, the word "phytogeographic" could have been left out of the chapter title as the subject matter is barely touched upon.

Chapter 4 - "Classification by Pharmacological Action" is perhaps the single most enlightening chapter

for the health-care provider. It gives detailed background information on chemical groups and plants that affect various body systems or act in a specific manner. For example, the first area of discussion, the central nervous system, discusses cerebral, brain stem, spinal cord and medullary reflex stimulants; cerebral depressants; narcotic analgesics, expectorants, and antitussives; plus non-narcotic analgesics and anti-inflammatory agents. Other major headings include autonomic drugs; local hormones and autocoids; psychotropic drugs; the somatic system; the senses and integument; agents affecting cellular integrity and immunity plus foods, pharmacological activity, and drug interaction. This section will give a much better understanding of plant drugs and their range of action.

The approach is conservative, and often the conclusion is that the substance may have some promise pending further studies of safety and efficacy.

Chapter 5 treats the inevitable discussion on "Herbal Teas: Benefits and Hazards." While providing a meaningful review of how herb teas have been and are viewed by the FDA, the less than meaningful 1975 "classic", "Herb Ratings by the FDA," is reproduced as reference with all its iniquities, and without a complete critical discussion of the information contained therein. The chapter does, however, give a good evaluation of those herbs for which toxicity is known and provides appropriate warnings of use to both consumers and the medical profession.

Chapter 6 - "Health Foods/Natural Foods as Drugs" begins, "It is difficult to define 'health food' since it means different things to different people." The authors opened the discussion in an appropriate manner as they proceed to worsen confusion in this short digression from pharmacology to sociology, as they attempt to define fads. This space could have been put to better use.

Chapters on "Natural Products as Cosmetics," and extensive chapters on "Poisonous Plants" and "Marine Pharmacology: Drugs From the Sea" follow. Those readers who deal with plant poisoning on a clinical level will want to be familiar with the useful chapter on this subject and its resources.

An appendix follows with lists of periodicals, important books, and database services. Unfortunately, periodicals and abstracting services are listed only by name, with no information on how to contact the publishers or those who provide the services. *Herb News* (a forerunner of *HerbalGram*) is listed, even though it hasn't been published for over seven years, and *HerbalGram* is absent from the listing. Similarly, the now defunct Herb Trade Association is discussed in an earlier chapter as if it is an extant entity.

When one begins to read, then use the reference (Part 2 — the monographs), one wishes that the authors had devoted an entire book to monographs covering the majority of natural products in commerce. Fifty-seven natural products are treated in the monographs. Each briefly covers nomenclature, botany, history, chemistry, pharmacology, toxicology, and clinical notes. The approach is conservative, and often the conclusion is that the substance may have some promise pending further studies of

See NaturalProducts , page 42

Book-of-the-Month Club Selection

The Food Pharmacy

Jean Carper. 1988. Bantam Books, 666 5th Ave., NY, NY 10103. 367pp. Hardcover. $18.95.

You are entering into a world where the ordinary takes on a technical dimension; where the technical and scientific is found in the commonplace. A dimension where ancient myth meets modern science, where the testing laboratory meets the annals of folklore. Medical texts, pharmacoepias, and the *PDR* are confounded with the Monday morning shopping list. Turn left at the dairy case, go past the cough and cold remedies to the produce counter.

No, you are not in the Twilight Zone; you are in *The Food Pharmacy*.

Submitted for your consideration: A land where illness and disease are discussed in terms of diet. A place where the term "drug" is replaced with "food"; where garlic is used for antibiotics and also as an anti-clotting agent and hypotensive; where chili peppers are used as lung tonics and decongestants; where cranberries are eaten for their therapeutic value as urinary tract disinfectants; where Chinese mushrooms are eaten to bolster the immune function. Imagine a clinic where the patient is brought a meal on a tray by the nurse/waitress, instead of the usual array of pills and medication!

Sound like ancient Egypt or Mesopotamia? How about the good ole U.S. of A. in the 1980s—or maybe the year 2000. If you think that the bran/colon cancer reduction connection is big news, or the oat bran/cholesterol reduction is a breakthrough—then you are in for an even bigger surprise. The bran deal is just the tip of the proverbial iceberg. What's available just under the surface is a whole range of pharmacologically active substances to be found in everyday fruits, vegetables, and spices, and other common foods.

Author Jean Carper (*Jean Carper's Total Nutrition Guide*), formerly a health correspondent on CNN, has done a great service to the herb and natural food movement. Ms. Carper, possibly more than any other writer, has brought to the mainstream of American nutrition and medical communication the simple and basic idea that common foods *do* have beneficial health value. Consider the following quotes from the introduction to this book:

"Eating turns out to be the world's greatest pharmacological experiment."

> ***"Scientists are beginning to understand how food and food chemicals can exert influence against disease at a cellular level."***

"The pursuit of knowledge about the food pharmacy is not an inconsequential event. It is engaging some of the best scientific minds in the world."

"Much of the new scientific interest in the food pharmacy is linked with ancient and current folklore."

"What distinguishes current food knowledge from folklore is an understanding of the mechanism by which foods control the human physiology."

"There's no question that plants, including those in the diet, are pharmacologically active as proven by the fact that we make their essences into drugs."

"Scientists, who once saw foods as mere collections of individual nutrients, are now vigorously beginning to explore their larger pharmacological complexities."

"Scientists are beginning to understand how food and food chemicals can exert influence against disease at a cellular level."

"Fantastic discoveries in both the underlying mechanisms of disease and the drug activity of foods are merging to inject new validity and vitality into the food pharmacy."

"There is a revolution going on in the way we think about food. And what a wonderful revolution it is! Like Hippocrates, we, too, are beginning to realize that food is potent medicine."

Enough said. The book discusses fifty common foods, from garlic and onions to ginger and chilies; from coffee to tea, milk to fish. In a simple, non-technical manner, the author elaborates some of the most recent research that seems to bear out some of these foods' ancient reputations as medicines.

Author Carper is to be commended for her approach and the breadth of her research. She has apparently done much of her homework relying on such noted medicinal plant experts as Professor Norman R. Farnsworth (University of Illinois) and Dr. James A. Duke (USDA) to provide her with much of her data and networking.

What Jean Carper is saying in this book will not be any surprise to herbalists, many alternative health practitioners, natural food consumers, and even some researchers and a few medical doctors and pharmacists. The value of food and spices as potential preventative and curative agents in health is already well-known by many people.

But where this book will have its biggest impact is with the mainstream American consumer who is just beginning to accept the idea that diet, exercise and other lifestyle changes can play an important role in preventive health-care. In addition, hopefully it

See Pharmacy, page 42

LIVING LIQUEURS. *James A. Duke. Illustrated by Peggy Duke. Quarterman Publications, Inc., P.O. Box 156, Lincoln, MA 01773. 1987. Softcover. 110 pp. $15.*

On a number of occasions I've heard people ask jokingly, "I wonder what Jim Duke does in his spare time?" Stop wondering. Here it is. This collection of writings on fifty herbs commonly used as flavor ingredients in liqueurs includes a discussion of "culture," "uses," and "folklore" for each plant. This is an excellent compilation of important details in the many herb periodicals and books we all have on our shelves but never have time to read. Dr. Duke has to be commended for saving us the trouble.

The culture information includes much statistical data that is difficult to come by in most herb gardening books — unique gleanings from less than widely distributed sources. The information on uses includes lists of the ways in which each plant is used in cooking. Here is where you will find the "living liqueurs"—recipes, suggestions for making various spiritous concoctions, some enticing; others you should save for a rainy day in a tropical jungle. As one would expect in a book from Jim Duke, the information on medicinal use consists of strings of lists extracted from the various works at hand, interspersed with opinions and a humorous quip here and there. Following each article are a few lines of Duke's self-styled "varicose verse." If you start perusing this book, simply by reading the poems, you will probably want to read the rest of the text, because this varicose verbosity could drive one to drink! It's a "fun book," but you'll also find little gems of information between each sip. — *SF*

COMMON FRAGRANCE AND FLAVOR MATERIAL; PREPARATIONS, PROPERTIES AND USES. *Kurt Bauer and Dorothea Garbe. VCH Publishers, Suite 909, 220 East 23rd St., NY, NY 10010. 1985. Hardcover. 213 pp. $59.*

This is one of those useful books for research and development workers in the herb trade that just hasn't received much publicity in the U.S. The book represents a translation of the chapter on fragrance and flavor material in *Ullmanns Encyklopadie der technischen Chemie* Vol. 20, 4th ed. (Verlag Chemie GmbH, Weinheim, W. Germany. 1981), with additions and revisions. The first half of the book is a listing of single fragrance and flavor components by chemical group, explaining the nature and structure of each compound or group of compounds, its natural sources, and product use. The next section covers essential oils, their characteristics, composition, quality determinants, production regions and notes on use. The book has an extensive bibliography and a formula index with CAS registry numbers. Particularly useful for natural product chemists, those in product development, and the curious. — *SF*

CULINARY BOTANY: THE ESSENTIAL HANDBOOK. *Brant Rogers and Bev Powers-Rogers. PRP, Box 5403, Kent, WA 98064-5403. 176 pp. 1988. Softcover. $12 postpaid.*

For the many single yuppies that cruise the produce aisle in the nearby gourmet market, looking for radicchios and redheads, this could be the book you've been waiting for. Let's admit it: most of us have probably had a tough time keeping up with all the funny shapes and funnier names that we see popping up at the produce counters. I know I've felt like a complete idiot at times! We can take heart for there is a guide to the many new foods that are surreptitiously slipping into our American diet. From Amaranth to Arrowhead, from Casava to Cherimoya, and from Sapotes to Sorrel—this book will educate any dunce on the ins and outs of exotic produce.

Most of the short monographs contain plant descriptions, culinary uses, pictures, and botanical classification. Appendices contain tables showing nutritional values of many of the new vegetables, plus rankings by fiber content and other nutritional components. There's the International Names of new fruits and veggies—a handy cross reference of English, French, Spanish, Cantonese, Hindi, Arabic, Japanese, Chinese, and Vietnamese; plus a taxonomic chart of veggies by family, order and other botanical classes for those veggie-techs out there.

Hey babe. How about coming over to my place for some Cardoon Crisps, Jujube Jam and Mangosteen Chutney? No? Oh, well. If this book doesn't help your social life, it's bound to stimulate your appetite! — *MB*

FRUIT AS MEDICINE. *Dai Yin-fang and Liu Cheng-jun, translated from the Chinese by Ron Edwards and Gong Zhi-mei. Rams Skull Press, box 274, Kuranda Q4872, Australia. 135 pp. 1987. Softcover. $15 postpaid.*

Originally published in 1982 in China, this book lists over 150 fruits and their traditional applications within Chinese folk medicine. Each fruit is described botanically with the traditional aspects of taste and other factors important in Chinese medicine. Therapeutic applications are quite specific with precise dosages and combinations with other ingredients suggested providing a valuable and interesting journey into an important aspect of a time-honored tradition. The translator is also expecting to publish *Vegetables As Medicine* and *Flowers As Medicine* in the near future. The combination would make an excellent addition to any serious student's library, especially clinicians with an interest in the role of traditional foods as medicines. — *MB*

THE STATE OF MEDICINAL PLANTS RESEARCH IN NIGERIA

Edited by Abayomi Sofowora. Ibadan University Press, Ibadan, Nigeria. Available in the U.S. from Dr. James L. Edwards, Dept. of Philosophy, Nassau Comm. College, Garden City, NY 11530. 1986. Softcover. 404 pp.

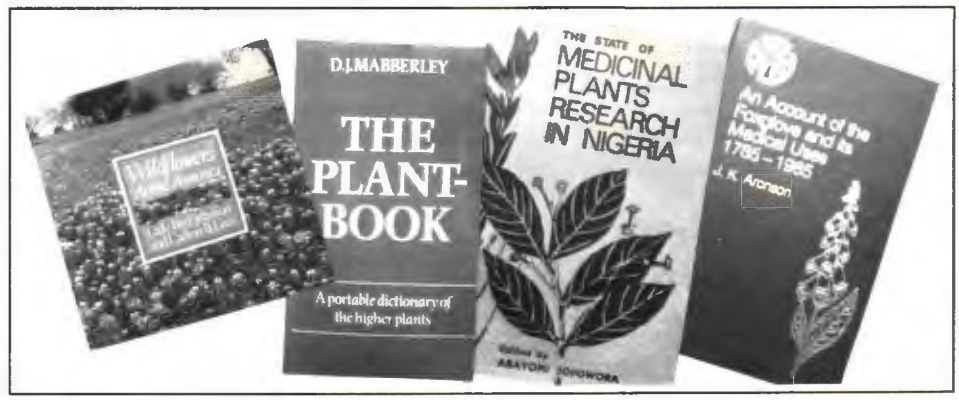
This work is a collection of plenary lectures, contributed papers, lectures of invited foreign contributors, abstracts of posters, and reports from the Workshop on Medicinal Plants held in Ife, January 7-11, 1986. Tropical Africa is still an underexplored frontier for medicinal plants and biologically active compounds from plants. This collage of articles on traditional medicine, sourcing raw material, veterinary aspects of medicinal plant research, treatments for specific disease conditions, and chemical aspects of various plants provides a good overview of the state of medicinal plant research in Nigeria. Along with China, India, and a handful of other countries, Nigeria has been at the forefront of the World Health Organization's effort to blend traditional and modern medical modalities. Those interested in the traditional medicines of Africa will want to read these papers.— *SF*

AN ACCOUNT OF THE FOXGLOVE AND ITS MEDICAL USES 1785-1985.

J.K. Aronson. Oxford University Press, 200 Madison Ave., NY, NY 10016. 1985. Hardcover. 399 pp. $45.

Few plant compounds have become such an important part of the armature of modern medicine as those found in the common Foxglove *(Digitalis purpurea)*. Aronson celebrates the 200th anniversary of William Withering's famous "Account of the Foxglove..." with the publication of this volume. First is a reprint of Withering's classic with copious notations from Aronson. Second is a thorough account of the history and modern use of this plant drug.

This fascinating chronicle of an exceptionally important medicinal plant is recommended as a resource portraying at least one medicinal plant as mainstream rather than medieval. — *SF*



WILDFLOWERS ACROSS AMERICA.

Lady Bird Johnson and Carlton B. Lees. 1988. National Wildflower Research Center & Abbeville Press, 488 Madison Ave, Ny, NY 10022. 312 pages with 300 color photos. Deluxe hardcover. $39.95.

Get this book! Whether you are the type who has the time to stop and smell the flowers or not. No kidding. The color photos are so vivid that they appear to be in 3-D! Absolutely one of the most beautifully prepared volumes on the subject of wildflowers ever assembled. The authors are obviously no strangers to the subject. Lady Bird Johnson, former First Lady, is still actively engaged in the Beautification of America interests that she began during her late husband's presidency. In 1982 she donated $125,000 to the development of the National Wildflower Research Center near Austin, Texas, where various ornamental and commercial uses of native wild flowers are being studied. The masterful and meticulous preparation and publication of this book is yet another step toward her goal of a more beautiful, flowerful America.

Co-author Carlton Lees is well-known among botanists and horticulturists. Among other accomplishments, he is the former senior vice-president of the New York Botanical Garden, past director of several state horticulture societies, and editor-in-chief of *Horticulture* magazine.

The text is inspiring; the photos breathtaking. A mandatory requirement for herb enthusiasts, gardeners, horticulturists, and shut-ins who cannot get out of the house on a cold dreary winter's day, but would like an easy and inexpensive escape into the vivid colors of the prairies and mountains of America. The only thing missing is the "scratch and sniff" ink, but I swear I could smell these pages anyway. — *MB*

THE PLANT BOOK: A PORTABLE DICTIONARY OF THE HIGHER PLANTS

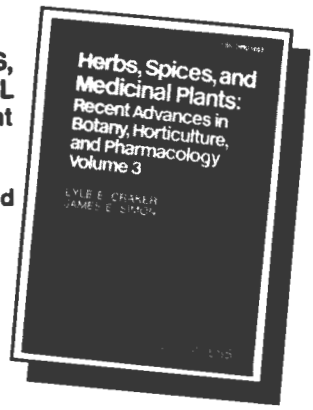
D. J. Mabberly. Cambridge University Press, 510 North Ave., New Rochelle, NY 10801. 1987. 706 pp. $34.50.

This is essentially a dictionary of genera and families of plants which provides quick, concise information on the number of species in a genus, common names, distribution, economic use, synonyms, and often, the most current botanical publication on a particular plant group. It replaces J.C. Willis's *Dictionary of the Flowering Plants and Ferns*, last published in this convenient "pocket-size" in 1931.

Appended to the text is a synopsis of Cronquist's system for the arrangement of flowering plants (based on Cronquist, A. 1981. *An Integrated System of Classification of Flowering Plants*, Columbia University Press); "Acknowledgement of Sources," which includes an extensive and useful list of floras and handbooks, plus periodicals; and general abbreviations and abbreviations of author's names (with dates).

No sense in spending more time with zealous accolades. I find this book more than useful. I find it essential. If you deal with or in plants, in whatever form, you will want to have this book. — *SF*

HERBS, SPICES, AND MEDICINAL PLANTS; Recent Advances in Botany, Horticulture, and Pharmacology. Volume 3.



Lyle E. Craker and James E. Simon, Eds. Oryx Press, 2214 North Central at Encanto, Phoenix, AZ 85004-1483. 220 pp. $69.50.

This is the third volume in the welcome review series covering all aspects of the title matter. The release of these annual volumes is becoming an awaited event in the natural products literature, as each volume is full of useful information from researchers the world over.

This year's release contains seven articles. 1) Culinary Herbs and Spices of Finland, by Seija Halva; 2) Pharmacokinetics of Polyphenolic Compounds, by T. Adzet and J. Camarasa; 3) The Biochemical Basis of the Hypoglycemic Effects of Some Plant Extracts, by Meir Perl; 4) Advances in the Agronomy and Production of Turmeric in India, by G.S. Randhawa and R.K. Mahey; 5) Plant Flavonoid Effects on Mammalian Cell Systems, by Elliot Middleton, Jr.; 6) Clinical Applications of *Centella asiatica* (L.) Urb., by Theodore Kartnig; and 7) An Ecological Approach to Medicinal Plant Introduction, by Akos Mathe.

The article on culinary herbs and spices of Finland provides an interesting overview of that country's medicinal and flavoring herb resources and production techniques. The article on polyphenolic compounds provides details on the pharmacokinetics of polyphenols common as secondary metabolites in plants, including phenolic acids, flavonoids, tannins, and anthraquinones. Hypoglycemic effects of plants in folk medicine has been a major natural products research interest for some time now, and Meir Perl's review on the subject helps provide a clearer understanding of the mechanisms of plant compounds with hypoglycemic activity. Those in the Turmeric trade will find the review article on this plant of interest. Elliot Middleton's review on the effects of plant flavonoids provides a good overview of how these compounds are utilized in cellular functions, and their antiviral, antitoxic, metabolic, mutagenic and carcinogenic activities. The extensive review on *Centella asiatica* reveals a good deal of interesting pharmacological data, especially from India's scientific literature. Akos Mathe's article on medicinal plant introduction should be required reading for all in the herb trade.

As the editors state in their preface, "Those desiring either general information or specific details, related to aspects of crop production, ecology, chemistry, pharmacology, and medical application of herbs, spices, and medicinal plants will find this volume of the review series especially useful."

If you are involved in production, product development, or research, you should keep this, and the two previous volumes of the series, within arm's length of your desk. — *SF*

Pharmacy

continued from page 39

will affect many sincere and well-meaning health professionals who, unfortunately, have not had adequate nutritional training in medical school.

This book can be considered an indispensible addition to any medical doctor's post-graduate education, and should be required reading for all medical and pharmacy students as well. Not to mention every Jewish Mother or Grandmother who wants to add to her arsenal of home remedies that already includes the formidable and all-purpose Chicken Soup. In an era when the term "preventive medicine" is becoming increasingly popular, the true value of this book emerges when it is read by the health consumer, who then might avoid the need to see a doctor or pharmacist, and, instead, go directly to *The Food Pharmacy*. — *SF*

Healing,

continued from page 37

philosophy that the origin of all diseases can be traced to subluxations of the spine. Further, while praising the general non-invasive philosophy of naturopathy, he laments the former status of naturopathic education in this country, acknowledging that it has improved in the past few years.

I recommend this book without reservation to anyone in the health food and herb industries who is interested in the subject of natural healing, and also to health professionals and those anti-health fraud and anti-quackery activists who often summarily dismiss alternative healing techniques as unscientific and without a valid foundation. —*MB*

Natural Products

continued from page 38

safety and efficacy. I have pulled the book off the shelves several times, only to find important natural products absent. One wonders, for example, why *Echinacea* is not in the book, while the authors have devoted space to "White Cohosh," rarely, if ever, used as a natural product, though sometimes encountered in cases of poisoning from ingestion of the fruits. The answer probably lies in the fact that the latter is a subject of a monograph in the junior author's *Lawrence Review of Natural Products*, while the former is not.

Clinicians will be disappointed that the "clinical notes" generally include a summary of intended use, effects, and toxicological notes. A health-care practitioner who wants to find information on dosage for a patient who insists on using one of these natural products will be disappointed with the lack of truly practical clinical facts.

As a *vade mecum* for the health-care professional interested in natural products, this reference falls short. As a welcome, useful, conservative survey and sampler of natural products medicine, this book is the first I have found that I can recommend with confidence to orthodox medical clinicians. — *SF*

Congress, *continued from page 16*

fungi, algae and lichens. Several such papers were presented at this congress, including the following.

Knaus and Wagner report that various polysaccharides of plant and animal origin have been found showing both inhibitory and stimulant activity on the human complement system (a part of the immune system concerning non-specific response). "Highly sulfated polysaccharides from lichens and algae showed a significant activating influence of about 100% activation." In contrast, neutral polysaccharides from animals or higher plants exhibited anticomplementary activity. A third group of polysaccharides including those from *Arnica montana* showed both kinds of activity on the complement system.

Houvinen *et al.* isolated various polysaccharide fractions from lichens also with significant effects on complement activity. The authors comment, "Most of the common antitumor agents are immunosuppressive. Preliminary results showed that some of the lichen polysaccharide fractions may have immunosuppressive effects by decreasing classical and/or alternate complement pathway activity."

Polysaccharides specifically from the plant *Arnica montana* were the subject of Puhlman and Wagner's research continuing the search for immunologically active polysaccharides from the Aster family. One of the polysaccharides, an arabinogalactan, stimulates activity of granulocytes (immune system cells) and significantly increases *in vivo* carbon clearance (a measure of the efficiency with which foreign particles can be removed from the system). It also stimulates macrophages (another important immune system cell) to excrete tumor necrosis factor—which is important in antitumor activity.

Meanwhile, Kraus *et al.* report on antitumor and immunostimulant properties a glucan form of the fungus *Phytophthera parasitica*. Some polysaccharides, especially glucans, are known to exhibit antitumor activity, and this research strongly supports the belief that that activity is due to the effects on the immune system. The research showed that the glucan had no direct toxic effects against tumor cells, and that the antitumor activity could be inhibited by cyclosporin A — a commonly used immunosuppressant. Another interesting observation is that pretreatment with the glucan was effective as well as treatment after a tumor had been introduced, probably indicating a protective effect against tumor formation.

Another important area of natural products research is in antihepatotoxic agents (compounds which prevent or treat liver toxicity). Dr. Wagner and his prolific Institute of Pharmaceutical Biology at the Univ. of Munich are active in this research as well. Research by Wong, Wagner *et al.* showed two types of compounds to be major antihepatotoxic components of the popular Chinese medicines *Rehmannia glutinosa* and *Cassia tora* (a coffee substitute). Tech details: the active compounds were iridoid glycosides and naphthopyrone glycosides from the two named Chinese drugs. Also researched were coumestans and anthraquinones from *Eclipta alba* and *Musa acuminata*.

Several presentations dealt with the therapeutic properties of garlic (*Allium sativum*). One paper by Dr. Bronwyn G. Hughes of Murdock Pharmaceuticals (USA) discussed antiviral activity of a commercial garlic extract, garlicin, against seven different animal viruses, including Herpes Simplex virus types 1 and 2. The commercial product reportedly demonstrated activity similar to fresh garlic against the Herpes viruses and "slightly less acitivity" against other viruses. ❐

Honest Herbal, *continued from page 36*

syndrome" in long-term users.

As Professor Tyler is aware, the Siegel study was not "scientific"— there were no controls established on the purported usage of what the patients ingested; there was no guarantee that they were actually using verified ginseng products. Tyler omits Siegel's connection of the overuse of caffeine with ginseng by some of the respondents of the survey. In other words, without getting into a critique of the Siegel study in this review, this is an example where the author makes evaluations of a product based on what is supposedly "scientific" support, when in fact the study was not scientific.

Throughout the book, Tyler continally notes that without clinical evidence, he cannot recommend this herb or that one—that there is often a lack of scientific evidence of an herb's efficacy. Yet he is also well aware, having himself published on this subject, that the lack of scientific research into some of the more commonly used herbs is not necessarily a result of lack of efficacy—it is more a matter of medical economics. In fact, some of the herbs for which proof of efficacy does not exist, simply have not been researched. There are few financial incentives for pharmaceutical companies or research centers to investigate therapeutic uses of herbs if there is no patent protection to help recoup the massive costs to be incurred in getting new drug approval from FDA. Sort of a catch-22 situation that Tyler has publicly lamented in some of his own speeches and articles.

Readers might be disappointed that the book does not contain an index, but it is quite easy to find information on each herb, making the need for such an index excusable. What's more, one of the most interesting features of *The New Honest Herbal* is the table at the back in which the author summarizes the herb name, the part used, its principal uses, pros and cons with respect to each herb's "apparent efficacy" and "probable safety" with a plus or minus sign in the appropriate column. As a response to some of his more intense critics, a review of this section will reveal that there are many more pluses than minuses, which should indicate that, in general, the author is still "pro-herb." — *MB*

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***HerbalViews* 1988 Slate of Interviews:** Madalene Hill; Cascade Anderson Geller; Nathan Podhurst; Carlo Calabrese (National College of Naturopathic Medicine); Steve Smith (Stash Tea). $5.50 per interview, or send SASE for more information to Barbara K. Bobo, Editor, 1920 Apple Road, St. Paris, OH 43072.

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#1 — Summer 83 (4 pp.) Eucalyptus Repels Fleas, Stones Koalas; FDA OTC Panel Reviews Menstrual & Aphrodisiac Herbs; Tabasco Toxicity?; Garlic Odor Repels Deer; and more.

#2 — Fall/Winter 83-84 (8 pp.) Appeals Court Overrules FDA on Food Safety; FDA Magazine Pans Herbs; Beware of Bay Leaves; Tiny Tree: Cancer Cure?; Comfrey Tea Recall; plus.

#3 — Spring 84 (8 pp.) Celestial Sells to Kraft; Flowers and Dinosaurs Demise?; Citrus Peels for Kitty Litter; Saffron; Antibacterial Sassafras; WHO Studies Anti-fertility Plants; Chinese Herbal Drugs; Feverfew Migraines; Ginseng as Cash Crop; and more.

#4 — November 84 (Vol. 1, #4). (12 pp.) Rebuttal to FDA Article; Medicinal Effects of Eggplant Leaves; Ayurvedic Medicine for Sciatica & Arthritis; Coffee and Iron Absorption; Synthetic Garlic; Lethal Chocolate Chips; Alternative Approaches to Gout; plus.

#5 — Spring 85 (Vol. 2, #1). (12 pp.) FDA Sues GNC; Herbalife v.s. FDA; Herb Traders Beware; Onions & Hypoglycemic Compound; Fenugreek Reduces Insulin Need?; Black Walnut Repels Fleas; Psyllium Allergy; Willow Tree Rooting Compound; Yohimbine for Sexual Therapy; Parsley Reviewed; The Sciences of Herbs; Soothing Chamomile; Eleuthero & the Liver; and more.

#6 — Summer 85 (Vol. 2, #2). (12 pp.) Desert Plants for Future Foods?; Hispanic Folk Medicines; Ginger for Motion Sickness; Ipecac Abuse; Toxic Clove Cigarettes; New Herbal Sweetener; Chilies & Ulcers; Milk Thistle Extracts; Ginseng for Liver Damage; plus.

#7 — Fall 85 (Vol. 2, #3). (12 pp.) Fund for Herb Safety Review; Scullcap Substitution; Therapeutic Gingko Trees; Ginseng & Potency; Dahlia as New Sweetener; Herbal Cures for Heroin & Opium; American Ginseng Harvest; Jojoba vs. IRS; Aromatherapy for Stress; Bloodroot in Oral Hygiene; and more.

#8 — Winter 86 (Vol. 2. #4). (12 pp.) Call for Government-sponsored Natural Drug Research, by Dr. Jim Duke; Ginseng & Agening; Chinese Herbs Treat Altitude Sickness; Sweet Wormwood for Malaria; Feverfew for Arthritis?; Coca Leaf Tea; and more.

#9 — Spring 86 (Vol. 3, #1). (12 pp.) Canadian Expert Panel Makes Herb Use Recommendations; Herbal Bibliographic Service; Methods in Phytochemistry; Valerian's Value; Feverfew Fever; Faulty Herbal "Scare" Articles; Juicy Jabornadi; and more. Recommended Reading Reprints: "Medicinal Plants in Therapy": by Professor Norman R. Farnsworth; "Herbal Water Purification?" by Dr. Jim Duke.

#10 — Summer/Fall 86 (Vol. 3, #2). (16 pp.) Major FDA Policy Shift on Herbs; Chernobyl Limits Supplies, Raises Prices; Garlic Studied for Obesity & Meningitis; Guar Gum for Diabetes; Tumor Inhibitor in Licorice; Anti-cancer Effect of Mistletoe and Turmeric; and more. Special Report: Overview of Spice Marketing.

#11 — Winter 87 (Number 11). (16 pp.) Plant Drugs in the 21st Century; Biologists Race to Save Tropical Rain Forests; Natural Blood Thinners; Chinese Antitumor Plants; Herbal Gout Remedy for Severe Cirrhosis; Banana Peel for Plantar's Warts; $2.68 Million for Plant Cancer Cures; and more.

#12 — Spring 87 (Number 12). (16 pp.) Ayurveda, the Traditional Herbal Medicine of India; Thai Medicinal Plants; Herbal Dream Inducer; Mexican Vanilla Revisited; Eleuthero and Soviet Athletes; Ginseng Growing Grows; and more.

#13 — Summer 87 (Number 13). (16 pp.) The Economic Significance of Herbs; Swedish Court Ruling in Evening Primrose Oil; Court Nixes FDA DALS; Society for Economic Botany Symposium on the Investigation of Folk Medicine; Ginseng Anti-aging Effect; Immune-enhancing Effects of Ginseng; Anti-ulcer Activity of Germander; Saikosaponin For Kidney Disease; Native Plant Survey Being Conducted; Mesquite Pods: Future Food?; and more.

#14 — Fall 87 (Number 14). (16 pp.) Celestial Seasonings Sold to Lipton, Inc.; Anit-diabetic Effect of Ginseng; NOVA Airs "The Hidden Power of Plants"; Botanist Duke Profiled in *Washington Post*; Chaparral and Mosquito Longevity; Mood-elevating Bananas; Special Report on Herbal Data Bases; Ethnobiology Update; An Emerging Science of Varying Specialities; and more.

#15 — Winter 88 (Number 15). (24 pp.) Major Herb Conference in Thailand; Export control of Ladyslipper; Canada Bans Comfrey Leaf; Tea Tannins Reduce Cholesterol; Feverfew for Physicians; Gingko Makes Big News; Licorice Retards Tooth Decay; Lomatium - Herbal Viricide?; Neem Extract - Natural Pesticide; Search for Anti-Cancer Plants Funded by NCI; Digitalis Depressing?; EPA Permits Use of Herbicide Alachlor; APHA Establishes OTC Committee; and more.

#16 — Spring 88 (Number 16). (24 pp.) Farnsworth Joins HRF Advisory Board; AHPA Standards Committee Making Progress; FDA Rules on GRAS Substances; Fresh Ginger Juice in Treatment of Kitchen Burns; King Tut and the Spice of Afterlife; "CocoDent"; Ginseng/Ethnobiology Conference Reports; Interview - Dr. I.I. Brekhman ; Rain Forest Update; New Tool in Antibiotic Arsenal; Valerian Effectiveness; Fungal Studies; More Polysaccharides; Recent Research on Ginseng; Heart Peppers; Yew Continues to Amaze; Licorice O.D. Prevention; Ginseng in Perspective; Poisonous Plants Update; Medicinal Plant Conservation Project; 1989 Oberly Award Nominations; Trends in Self-Care Conference; License Plates to Fund Native Plant Manual; and more.

#17 — Fall 88 (Number 17). (24 pp.) Sarsaparilla, A Literature Review by Christopher Hobbs; Hops May Help Metabolize Toxins; Herbal Roach Killer; Epazote Getting More Popular; Aloe Market Levels Off; Herbal Tick Repellent?; Chinese Herb Products Regulated; Celestial Seasonings Independant Again; Texas Botanical Garden; Plant Invaders; Interview with Professor H. Wagner; Research on Herbal Cancer Remedies; New Tool in Antibiotic Arsenal; Antiviral Alkaloids Inhibit AIDS Virus; Neurological Disease from Plant Seeds; All About Indoles; Huh? Lizard's Tale?; Sedative Peanut Leaves; Cardiac Benefits of Tienchi Ginseng; Antitumor Effects of Sophora; Anti-aging Formula; Chinese Arthritis Treatment; Kava Covered in Two Newspapers; Gin Ads Reveal Herbal Ingredients; High Flying Wild Flowers; Traditional Medicine of China, Vietnam Covered; Forest Watch; Herb Industry Adopts Lady's Slipper Resolution; and more.

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The Herb Research Foundation is a non-profit research and educational organization dedicated to raising funds for research, and providing reliable research data to members, the public, and the press. We believe there is a great potential for encouraging and directing research on common botanicals, and increasing the quality of information available on herbs as medicines, foods, and cosmetics.

HERBALGRAM

Members receive *HerbalGram*, the official publication of the Herb Research Foundation. *HerbalGram* presents reviews of research from the world's technical press, follows legal events involving herbal products, and reports on media coverage of herbs. Members can access in-depth information on herbs through low-cost HRF literature searches.

STRUCTURE

The Herb Research Foundation is an independent non-profit organization supported by grants and memberships, governed by an independent Board of Directors, and guided by an advisory board that includes some of the world's leading plant researchers and educators.

OBJECTIVES

- To encourage and support research on herbal folk medicines, herbal teas, and other herbal products.
- To publish and disseminate accurate research information to other researchers and the public.
- To provide a forum for discourse and cooperation between herbalists, physicians, health food advocates, and scientists.
- To serve as a reliable source of information on medicinal plants and herbal products for the public and the press.
- To form a liaison between the American herbal movement, and the worldwide scientific community.

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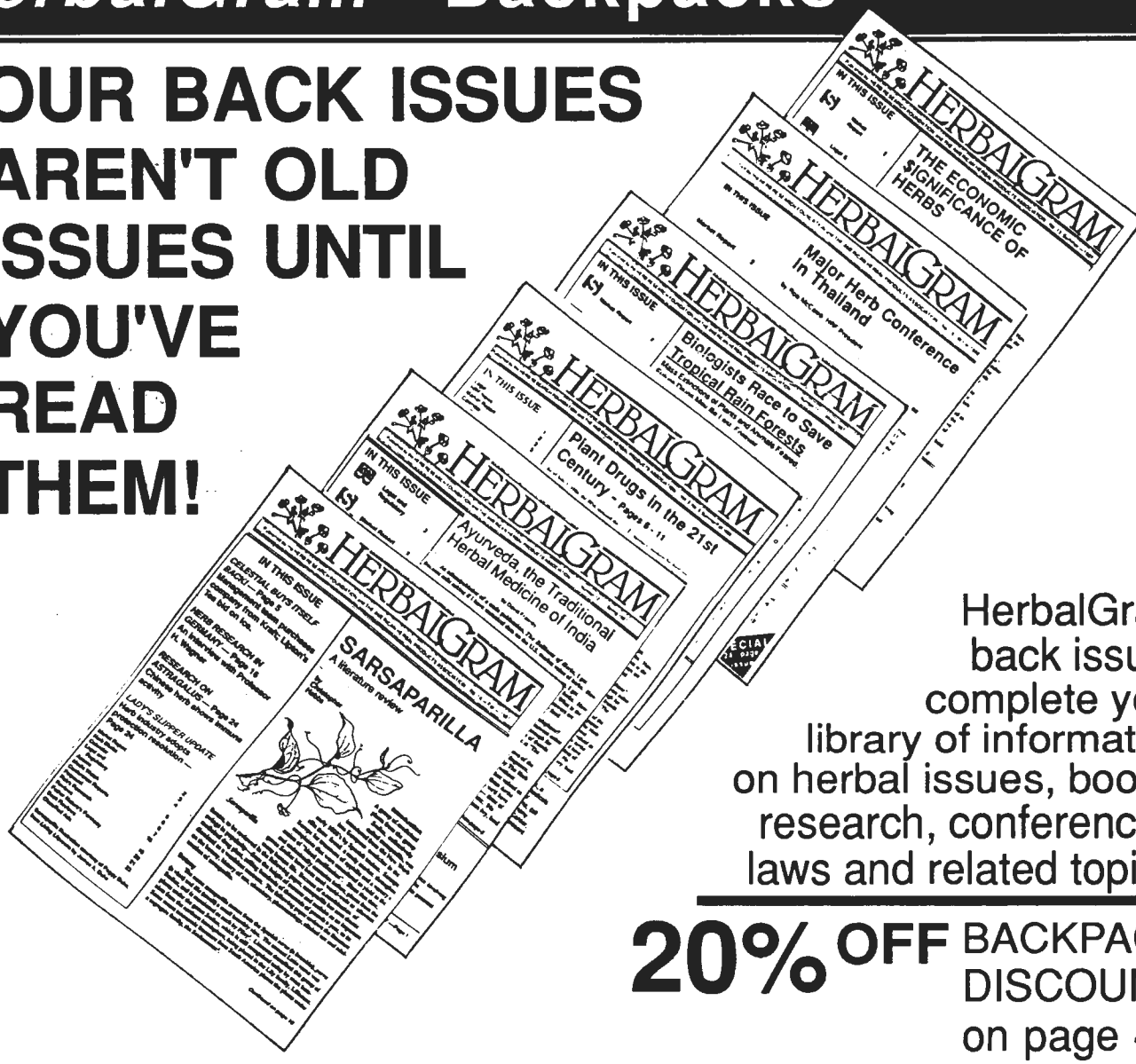

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