

AMERICAN HORTICULTURIST

AUGUST 1981





“Geraniums in Window Boxes”—Photograph by Dorothy Knecht

Flowers, flowers everywhere! The Swiss’ love for plants is apparent wherever a visitor to this charming country might look—be it traffic island, public park, private home or commercial establishment. Join Dorothy Knecht on our special tour of Swiss gardens in this issue, beginning on page 22.

AMERICAN HORTICULTURIST

AUGUST 1981

FEATURES

- The Cold Frame** 12
Text by Mary Ann McGourty
Illustrations by Robyn Johnson Ross
- Crystal Springs** 16
By George Baetjer
- Rhododendron Species Foundation** 19
By Jane Sansregret
- Tea Relatives** 20
By James A. Dove, Jr.



- Swiss Gardens** 23
By Dorothy Knecht
- Evergreen Maples** 28
Text and Photography by J. D. Vertrees
- Solar Greenhouses** 31
By Bill Yanda



COLUMNS

- President's Page** 2
Gilbert S. Daniels
- The Logania Family** 4
Jane Steffey



- Book Reviews** 8
Gilbert S. Daniels
- Pronunciation Guide** 43
- Gardener's Marketplace** 44

ON THE COVER: Lazy days are here again. . . . A feeling of serenity is evoked by this charming water scene in a garden near Wilmington, Delaware. Photograph by Donald Buma.



Enjoy solar benefits with a Janco Greenhouse.

All Janco models now available with your choice of regular or factory-sealed insulated glass.

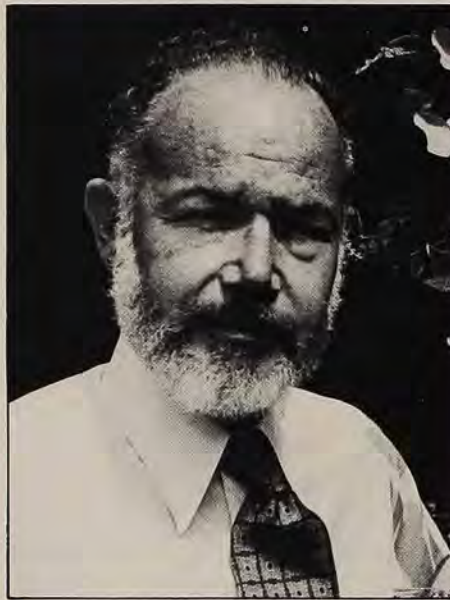
Add solar warmth to your home and increase your living area with a Janco lean-to, or make a Janco free-standing greenhouse the pleasure center of your lawn. Your Janco agent can help you choose the best model for your site, and advise you on the advantages of heat-retentive insulated glass. Every Janco is all-aluminum for minimum maintenance.

Think Janco when you think "greenhouse." Write for FREE 48-pg. full-color catalog today!



Janco Greenhouses

Dept. AH-8
9390 Davis Avenue
Laurel, Md. 20810
(301) 498-5700



This month horticultural education is again my topic of discussion. The American Horticultural Society is officially an educational institution. Our aim is to provide horticultural education and leadership for our members and for all American gardeners. Towards this end we publish a magazine and newsletter to bring you the latest information on gardening and to introduce plants and techniques that may be new to you. Have you tried a new gardening technique or grown a new plant in your garden this year? If you haven't you are missing half the fun of gardening.

It may be hard to find anything in gardening that is absolutely new. There were many more species of plants grown in gardens a hundred years ago than are generally available to us today, but I'm sure there are still many plants available that would be new to your individual gardens. And, of course, there are new varieties of plants which have only been developed in recent years. If you've recently enjoyed something new in your own garden, be it plant or technique, why not share it with all of us?

This leads me to the next point I want to raise. The American Horticultural Society is a national organization with members all over the United States and in many foreign countries. Do you personally know any of your fellow members? For the last couple of years we have run a series of gardening lectures at our headquarters in Mount Vernon. These programs have been

an unquestionable success and have served at least two purposes. Not only were the lectures a learning experience, but they also offered the opportunity for members to meet one another.

As a result of the success of this lecture program at our national headquarters, we now feel confident enough to offer help in organizing similar programs in other parts of the country. Wherever we have a concentration of members, we have a ready-made audience. Even where there may be only two or three members, we could help organize a program for gardeners in the community. A group of members in the Los Angeles area is preparing such a program right now. If you would like to plan a similar program, let us put you in touch with your fellow AHS members and help you set up a gardening education program. Lecture series, demonstration gardens and children's gardens are just a few of the ways that you can share your gardening enthusiasm with your friends and neighbors.

As any experienced gardener knows, sharing knowledge and plants are ways of expanding personal gardening pleasure. What about setting up an informal local AHS chapter and meeting at regular intervals? There are many other ways you can actively participate in your Society and make it a really national gardening organization. Write to us for suggestions.

Gilbert S. Daniels

—Gilbert S. Daniels
President



GREER GARDENS

Rhododendrons - rare
and unusual

Azaleas

Evergreen-Exbury-Deciduous

Dwarf Conifers-Bonsai Material
Flowering Trees & Shrubs-Books
Japanese Maples

Color Catalog — describes and
prices over 1600 different plants.

Widely recognized as a
valuable reference book.
1981 Edition, \$2.00

WORLDWIDE SHIPPING

Dept AH 1280 Goodpasture Is. Rd.
Eugene, Oregon, 97401
(503) 686-8266

Judy Powell
EDITOR

Rebecca K. McClimans
ART DIRECTOR

Barbara W. Ellis
ASSOCIATE EDITOR

Steven H. Davis
Jane Steffey
EDITORIAL ASSISTANTS

H. Marc Cathey
Gilbert S. Daniels
Donald Wyman
HORTICULTURAL CONSULTANTS

Gilbert S. Daniels
BOOK EDITOR

Louise Baughn
Cindy Weakland
ASSISTANTS TO THE EDITOR

May Lin Roscoe
BUSINESS MANAGER

Dorothy Sowerby
EDUCATIONAL PROGRAMS COOR-
DINATOR

Susan J. Elliott
MEMBERSHIP SUBSCRIPTION
SERVICE

John Simmons - Chromagraphics Inc.
PRODUCTION COORDINATION
COLOR SEPARATIONS

C. Lynn Coy Associates Inc.
104 East 40th Street, Suite 401
New York, NY 10016 (212) 687-0191
ADVERTISING REPRESENTATIVE

Replacement Issues of AMERICAN
HORTICULTURIST are available at a
cost of \$2.50 per copy.

The opinions expressed in the articles
which appear in AMERICAN
HORTICULTURIST are those of the
authors and are not necessarily those of
the Society. They are presented as
contributions to contemporary thought.
Manuscripts, art work and photographs
sent for possible publication will be
returned if they are accompanied by a
self-addressed, stamped envelope.

AMERICAN HORTICULTURIST is the
official publication of The American
Horticultural Society, P.O. Box 6118,
7931 East Boulevard Drive, Alexandria,
Virginia 22308, (703) 768-5700, and is
issued monthly. Membership in the
Society includes a subscription to
AMERICAN HORTICULTURIST.
Membership dues start at \$20.00 a year,
\$12.00 of which is designated for
AMERICAN HORTICULTURIST.
Copyright © 1981 by The American
Horticultural Society. ISSN 0096-4417.
Second-class postage paid at Alexandria,
Virginia and at additional mailing
offices. **Postmaster:** Please send Form
3579 to AMERICAN
HORTICULTURIST, Mount Vernon,
Virginia 22121.

Member of Society of National
Association Publications



Wayside's Dutch Treat An Investment For A Lifetime

Wayside's new Daffodil mixture consists entirely of hand picked imported Holland Bulbs. Varieties are carefully selected in order to bring you a long season of blooms that will multiply in number with each passing year.

Represented is a wide selection of Wayside's finest early, mid-season and late blooming Daffodils. From the spectacular new giant "Weatherproof" Daffodils to dainty clusters of fragrant Tazetta's, each of our top sized bulbs are guaranteed to fill this and coming springs with nature's own beauty.

Order today and in addition to this already special offer you will receive our two dollar fall catalog absolutely free, but that's not all. In January you'll also receive a free Wayside Spring Catalog valued at three dollars. That's right, order now and get five dollars worth of catalogs, plus a lifetime of flower-filled springs, and we pay the postage. Now that's a bargain!

Yes, please send me the following size Dutch Treat:

- Cat. No. 24 top-size bulbs \$12.50
- B-1515 48 top-size bulbs \$23.00
- 96 top-size bulbs \$43.00

Catalogs only - a five dollar value for just one dollar!

- Check or money order Visa
- Am. Express Master Card

Card No. _____

Exp. Date _____

Bank No. _____

Send Coupon To:
Wayside Gardens
804 Garden Lane
Hodges, South Carolina 29695

Name _____

Address _____

City _____

State _____

Zip _____

Don't Wait, Send Today!
Offer expires Dec. 15, 1981

THE LOGANIA FAMILY



CLOCKWISE FROM TOP LEFT: *Spigelia marilandica*; *Buddleia davidii*; *Gelsemium sempervirens*; *Strychnos nux-vomica*. Illustration by Alice R. Tangerini.

The redolence of a golden flower or a whiff of super-sweetness from a lavender tail of inflorescence leads us to explore the background of the givers of such sensual pleasures. Lo and behold! These flowering beauties have some skeletons in the family closet; some of their relatives are poisoners. The plot thickens as the golden trumpet itself is revealed to be a killer.

This is the logania family, Loganiaceae, which is well-known for two ornamental species: the fragrant yellow jessamine, *Gelsemium sempervirens*, and the lavender butterfly bush, *Buddleia davidii*.

Nearly 800 species in this family—trees, shrubs and vines—are distributed throughout the tropic, subtropic and tem-

perate zones of the world. They are seldom abundant and never found in dense stands. Many members of the clan are extremely poisonous, causing death by convulsion. Among cultivated species, *Gelsemium* and *Strychnos* contain toxic alkaloids. Two large genera having more pleasant associations are *Buddleia* and *Fagraea*, known, respectively, for their graceful branching and enormous flowers.

Curiously, the genus *Logania*, from which the family gets its name, is seldom cultivated. *L. vaginalis* can be grown in Zone 10 in California. Native to New Zealand and Australia, this genus is named for James Logan (1674-1751), acting governor of the province of Pennsylvania and a botanical writer. In recognition of his

botanical research, Linnaeus named the genus for him.

Some of the botanical characteristics of the family are: typically opposite leaves with untoothed margins, flowers borne in terminal clusters having four or five partly united sepals, four or five petals partly united to form a tube, and four or five stamens united with the corolla tube. More complicated details of fruit and seed define differences among family members.

The genus *Buddleia* affords us numerous conspicuous garden favorites. The name honors Rev. Adam Buddle (1660-1715), a British botanist. The species are vigorous, woody or semi-woody shrubs of varying height, known for their large clusters of small flowers.

Many buddleias originate in tropical regions, and only a few of the hardiest species in the genus are cultivated. Some of these can be grown for winter bloom in the cool greenhouse. Plants are typically more or less covered with a glandular or scaly pubescence and are deciduous or half evergreen. The leaves are rather large, sometimes as much as 10 inches long.

Buddleia davidii, the orange-eye butterfly bush, is the species best known in cultivation. Leaves are green above and white-felted beneath. The flowers are lilac, fragrant and orange at the throat. It blooms from late July to frost. Many elegant varieties and cultivars are available from nurserymen, but to most gardeners the name buddleia means *B. davidii* or one of its varieties.

E. H. "Chinese" Wilson, the famous plant explorer, in his book *Aristocrats of the Garden* (1926), writes of *B. davidii*: "The most valuable recent addition to midseason shrubs. . . . *B. davidii* and its varieties are fast winning well-deserved popularity in this country under the name of summer lilac. They are inhabitants of central and western China. . . . They are scarcely hardy as far north as Boston. . . . My own favorite is the var. *magnifica* which is distinguished by its relatively large, intense violet-purple flowers with the edge of the petals crinkled. And, further, I do vigorously protest against the absurd name of 'Butterfly Bush' which some dealers would fain foist upon us as a popular name for these shrubs. . . ."

AHS REMINDS YOU OF IMPORTANT MEMBERSHIP BENEFITS:

GEICO PREFERRED PROGRAMS FOR LOW-COST AUTO AND HOMEOWNERS INSURANCE.*

The coupon below is special. Because the Society has arranged to have GEICO PREFERRED programs available to you, you can use the coupon to request a free rate quotation from GEICO. If you qualify, you may save money on auto and home insurance. As a Society member, you are entitled to extra consideration for advantages like these:

LOW RATES FOR QUALIFIED DRIVERS.

GEICO PREFERRED insures those members of preferred groups—like AHS—whose driving records are better than average. Better drivers cost GEICO less. And these savings result in low rates.

GUARANTEED ONE-YEAR RATE ON YOUR AUTO POLICY AS WRITTEN.

Many auto insurance companies now offer only 6-month auto policies. But as long as you don't change the conditions of your policy, GEICO PREFERRED rates are guaranteed to remain the same for a full year—so you don't risk having your rate increased after just 6 months.

LOW-COST HOME INSURANCE, TOO.

Just check the appropriate box at the bottom of the coupon, and you will also receive free information on

low-cost insurance for homeowners, renters and owners of condominiums. Your application will receive special consideration.

YOU CAN CUSTOMIZE YOUR OWN COVERAGE.

The coverages GEICO offers vary by state, but you have many options in putting together your car and home insurance packages, both in the amounts and kinds of protection. You also get a wide choice of convenient payment plans. GEICO auto insurance is not available in New Jersey and Massachusetts. Homeowner insurance is not available in New Jersey and Mississippi.

YOU GET GEICO PREFERRED TREATMENT.

All Society member inquiries receive prompt, preferential service by a GEICO PREFERRED Insurance Counselor.

FOR FREE RATE QUOTATION CALL COLLECT (301) 986-3344

Your AHS membership entitles you to special consideration for low-cost auto and home insurance. Good drivers, find out how much you may save. For free rate quotation, call (301) 986-3344 collect. Or mail this coupon. No obligation. No salesman will call.

THIS RATE REQUEST FORM IS BROUGHT TO YOU BY AHS FOR YOUR BENEFIT.

Send to: GEICO PREFERRED, GEICO Plaza, Washington, D.C. 20076.

Name _____
 Address _____ Apt. # _____
 City _____ State _____ Zip _____
 Employer _____ = Yrs. _____
 Govt. or Military Grade _____ Have you previously been insured with GEICO? Yes No
 Location of car if different from address above:
 Car = 1: City _____ State _____
 Car = 2: City _____ State _____
 Car = 3: City _____ State _____
 Name of current insurance co. _____ Month/Year Current Policy Expires _____

List all drivers	M or F	Relation	Age	Marital Status	Occupation	Yrs. lic.	Driver Training		% of Use of Cars			Accidents in Past 5 Years*		Violations in Past 3 Years*		License Suspension*	
							Yes	No	= 1	= 2	= 3	Yes	No	Yes	No	Yes	No
		SELF															

If student away at school, how many miles to school?

_____ miles.	CAR 1	CAR 2	CAR 3
Year & Make ▶			
Model (Nova, Granada, etc.) ▶			
Body type: 2/4 dr. sdn, hardtop, sta. wag ▶			
No. of cylinders ▶			
Est. Annual Mileage ▶			
Days per week driven to work or parking area ▶			
One way driving distance ▶			
Is car used in business (except to/from job)? ▶			

*For accidents, violations, or license suspension, give dates and complete details, including cost of damages, on a separate sheet.

Check for Information on Homeowners/Renters/Condominium Insurance. (Not available in Mississippi)

718



Energy-Free Reflectors Give Plants More Light

Sun-Stretcher Shells can help you produce blossoms faster, grow sturdier seedlings, raise a wider variety of plants. Made of mirrored plastic. Shaped to collect and concentrate light. Can make a windowsill more like a greenhouse or brighten a dark corner. 12" tall, 9" wide. \$3 each, 2 for \$5.



Sun-Stretcher Collars are ideal for offices or any place with overhead lighting. Opens wide to go on without disturbing plant. Promotes bushier growth. 9" across, 2" high, 3" opening. \$2 each, 3 for \$5.

Sun-Stretcher Stakes help small plants flourish. 5" reflector attaches to 6" aluminum wire that can be bent to focus light on plant. \$1 each, 6 for \$5.

Sun-Stretcher Set, one of each, a \$6 value, \$5.

All prices include postage and handling.
If you're not pleased with any item return for refund.
Send check or money order to:

growth products company
Box 806-C10, Ravinia Station, Highland Park, IL 60035

STRANGE RELATIVES CONT'D

"*B. davidii* and its varieties have won widespread recognition since I introduced them some fifteen years ago. . . . For the Pacific slope two other species which produce their flowers in January and February are strongly recommended. One of these (*B. asiatica*) has pure white, deliciously scented flowers arranged on long, slender cylindrical tails, gray willow-like leaves, and slender arching and spreading branches. The other (*B. officinalis*) is a more sturdy shrub with broader leaves, stouter branches and broader branching heads of rose-pink flowers each with an orange eye. A hybrid between these two species has been raised and named *B. X farquharii*. This plant has pale pink flowers and is perfectly intermediate between the parents and combines the good qualities of both. These 'Winter Lilacs' as they may be termed, are very free growing and free flowering shrubs and to obtain the best results they should be severely pruned each year after flowering."

Anyone who has grown *Buddleia davidii* can attest to the fact that butterflies of various kinds are attracted by the color of the inflorescence and its characteristic fruity aroma. The butterfly lands on the flat surface formed by the out-curved corolla lobes and draws the nectar from the base of the long tube.

Three other worthy members of the genus *Buddleia* are *B. alternifolia*, *B. globosa* and *B. colvilei*. *B. alternifolia*, the hardiest, blooms in May. It differs from the family trait of having opposite leaves; its leaves are alternate on the stem, hence the specific name. *B. globosa*, from Peru, stands some degree of frost. Its leaves are nearly evergreen and rusty-hairy beneath. Small, yellow, fragrant flowers borne on a long-stalked globe appear in July, giving it the name orange ball tree. *B. colvilei* is rare in America. This lovely rosy-flowered species comes from India and may attain a height of 30 feet. I hope to see it in the gardens of Crathes Castle in Scotland on our AHS garden cruise of the islands of Britain in May.

One of the spring blossom thrills for northern flower lovers travelling in the southeast is the Carolina jessamine, *Gelsemium sempervirens*, variously known also as Carolina woodbine, evening trumpet flower and yellow jessamine. Festooning porch railings, twining along garden fences and climbing high in trees, it flaunts bunches of golden trumpets and yields a heady perfume. No wonder it was chosen as the state flower of South Carolina.

Gelsemium sempervirens is a native American vine, flourishing in woodlands and on roadsides from Virginia southward to Florida and Texas. The only other species in this genus is Asiatic. Carolina jessamine is hardy as far north as the Virginia coastal region and tends to be evergreen in its more southern range. In the coastal regions of the south it may bloom in February; elsewhere it may flower as late as April or May.

The name *Gelsemium* is derived from the Italian *gelsemino* for the true jessamine, *Jasminum officinale*, native to the Himalayas of western China, and belonging to the Oleaceae family. The common name, jasmine, is of French and Arabic origin. Evergreen is the meaning of *sempervirens*.

But beware. This gorgeous, floriferous, fragrant vine is one of the treacherous members of the family; its juices are dangerously poisonous. Native Indians and early settlers used leaves, flowers and roots in various concoctions for pain relief but always with great care. Preparations made from the roots and rhizomes have been used as a central nervous system depressant, to reduce fever, and to relieve pain. It has a powerful effect on the nervous system, and while it can be soothing and sedating in many painful conditions, at the same time it can adversely affect the eyesight. The root is the portion of the plant used in medicine and is listed in the *U.S. Pharmacopoeia*, an official listing of drugs, chemicals and medicinal preparations. It is yellow, bitter tasting and poisonous, definitely not a home remedy.

Of the cultivated genera in the logania family, only the American native *Spigelia marilandica* is not a woody plant. It grows in rich woods and thickets of the eastern United States and south to Florida and Texas, but in scattered locations only and never abundantly. It is known as Maryland pinkroot, Carolina pink, American worm-root or worm grass. A tea made of fresh roots or of the entire plant was used by the Indians to treat intestinal worms. The Indians transferred their knowledge to the white man and were the first commercial collectors; the plant was exploited heavily for shipment overseas and it became scarce in its native haunts. It, too, has been listed in the *U.S. Pharmacopoeia*.

The name *Spigelia* comes from the surname of Adrian von der Spiegel (1578-1625), professor of anatomy at Padua and a writer on botanical subjects. *Marilandica*

DOUBLE-WALL INSULATED SOLAR GREENHOUSES

ALL STYLES &
WINDOW UNITS
FROM JUST . . .

\$399

SOLAR

QUICK-MOUNT PANELS FOR
SKYLIGHTS, WALLS, ROOFS

AS LOW
AS JUST . . .

\$315
SQ. FT.

SOLAR

STRUCTURES & ACCESSORIES
THAT HELP HEAT YOUR HOME
AND QUALIFIES YOU FOR A

**40% TAX
CREDIT!**

COLOR BROCHURE \$1, SENT FIRST CLASS



VEGETABLE FACTORY, INC.
P.O. Box 2235, Dept. AH-104
New York, NY 10163
Or Call: (212) 867-0113

is for the state of Maryland where the plant must have grown at one time; now it is hard to find there.

Pinkroot blooms in May and June on a plant one to two feet tall. The red, tubular flowers with yellow throats are produced on one-sided spikes. It is a plant suitable for the hardy perennial border and is described by many as handsome.

"Strychnine—a highly poisonous crystalline alkaloid obtained from *nux-vomica* and related plants; used in small doses as a stimulant." —Webster.

Strychnos is a genus of about 150 species, many of which contain drug alkaloids. Some yield valuable medicines. The name the genus bears is Latin for nightshade, applied here by Linnaeus because so many of these shrubs and trees are poisonous.

Strychnos nux-vomica or strychnine is a medium-sized tree, native to southern Asia. Its seeds contain the poison. The bark of one or two species, *S. toxifera* for one, serves as the main or secondary ingredient in the preparation of curare, the most effectively fatal arrow poison known. The alkaloids of Saint-Ignatius' bean of the Philippines, *S. ignatii*, is valued as a remedy for cholera. *Strychnos spinosa*, the Natal orange of South Africa, is a spiny shrub; its seeds are imbedded in a sweet edible pulp. Both *S. nux-vomica* and *S. spinosa* grow in extreme southern Florida and are hardy nowhere else in the United States.

Additional cultivated members of the logania family without such unsavory reputations are *Fagraea* and *Nuxia*.

Fagraea is an Asiatic genus with some large trees that yield good timber. *F. fragrans* is a beautiful flowering tree planted for shade in tropical regions. Its large, showy flowers are probably pollinated by bats. The flowers of *F. berterana* are highly perfumed. Its Hawaiian name, *Pua-kenikeni*, means "ten-cent flower" because formerly the flowers were sold for ten cents each and strung in leis or placed in coconut oil to perfume it.

Nuxia floribunda is another species of flowering tree adaptable to culture in Zone 10 in California.

Being dangerous and lethal doesn't rob the Loganiaceae of their virtues, and even the lethal members of this diverse family have medicinal value. ☉

—Jane Steffey

Jane Steffey is the horticultural advisor to the American Horticultural Society.



Enjoy WATER-LILIES In your own garden.

Lilypons catalogue features everything needed for your garden pool, including the pool.

Lilypons Water Gardens

WATER-LILIES

Fiberglass garden pools,
Lotus, aquatic plants,
Filters, pumps, lights
PVC pool liners, sweeps
Statuary, books, koi
Goldfish, scavengers
Send \$2.00 for catalogue.

LILYPONS WATER GARDENS

1508 Amhort Road 1508 Lilypons Road
Lilypons, Maryland 21717 Brookshire, Texas 77423
(301) 874-5133 (713) 934-8525

YES, Please send me the new colorful
Lilypons catalog. I enclose \$2.00.

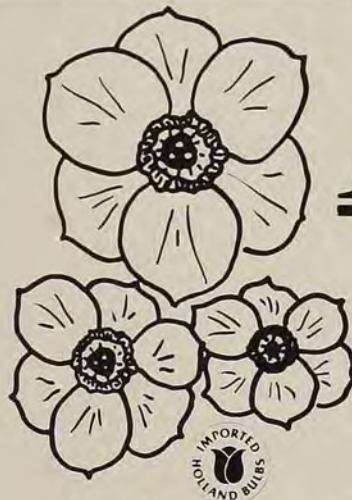
Name _____
(Please print)

Address _____

City _____

State _____

Zip _____



Act Now For A Flower-Filled Spring

Park's fall catalog has 48 full-color pages offering over 200 varieties of Holland grown Tulips and Daffodils, plus Crocus, Hyacinths, Alliums, Anemones, African Violets, Amaryllis, Iris, Lilies, Poppies, perennials, house plants, ground covers, and much, much more! Over 350 photographs are reproduced as true-to-life as technically possible, so what you see is what you get. We guarantee it! So don't wait, send today and get started on a flower-filled spring!

Send For Your **FREE** Edition of Park's 1981 Fall Flower And Bulb Catalog!

Send Coupon To:
Geo. W. **PARK SEED** Co., Inc.
477 Cokesbury Road
Greenwood, South Carolina 29647

Name _____

Address _____

City _____

State _____ Zip _____

Don't Wait, Do It Now!

DUNCAN'S
Create a Pond



With Duncan's Magic Wand, create a Garden Pond with Waterlilies and Fish!

- Seven assorted modular units attach with stainless steel bolts and seal together with silicone rubber for unlimited creations.
- Each modular unit features a top edge that allows rock or brick placement partially below the water line for a unique natural appearance.
- Pre-drilled fiberglass that lasts a lifetime.
- Easily assembled.

Call or write today for free literature.

DUNCAN'S
Water Gardens

691 North Temperance
Fresno, California 93727
Phone (209) 255-7233



HUNDREDS OF COMBINATIONS



Radiant Room SOLAR GREENHOUSE KIT

An attractively designed addition for your home, the RADIANT ROOM combines natural wood with glass to create a beautiful passive solar greenhouse. Roof insulation and tilted double glazing efficiently collect the sun's energy. And a RADIANT ROOM is simple to install. All components are manufactured for easy assembly.

SOLAR HEATING THE MOST BEAUTIFUL WAY

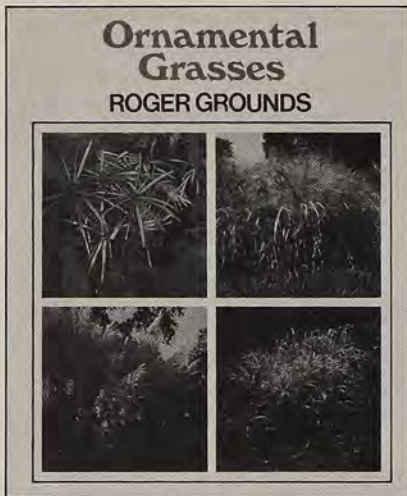
write:

ABUNDANT ENERGY INC.
RADIANT ROOM Dept. H-8
116 Newport Bridge Road
Warwick, NY 10990



ORNAMENTAL GRASSES.

Roger Grounds. Van Nostrand Reinhold Co., New York, New York. 1981. 216 pages; hardbound, \$16.95. AHS discount price, \$13.10 including postage and handling.



Although the grasses are flowering plants, their flowers are usually small and insignificant. Nonetheless, their often showy inflorescences and attractive growth habit have a great deal to offer in the garden. Bamboos are the largest of the grasses, and although not hardy in most areas, a number of species grow well north of Washington, D.C. As one of the largest families of flowering plants, with more than 600 genera and 10,000 species, it is surprising how few species of grass we grow in our gardens. Mr. Grounds' book is an attempt to correct this situation. Fifty-eight color photographs and 59 line drawings illustrate a few of the many species recommended for ornamental use. Unfortunately, if you are tempted by what you see in this book, you may have difficulty finding a commercial source. Ornamental grasses are not well represented in the nursery trade, although perhaps more of these grasses will become available if we increase our awareness of them and create a demand.

GOURMET GARDENING.

Ann Moyer Halpin (Editor). Rodale Press, Emmaus, Pennsylvania. 1981. 243 pages; softbound, \$9.95. AHS discount price, \$9.70 including postage and handling.

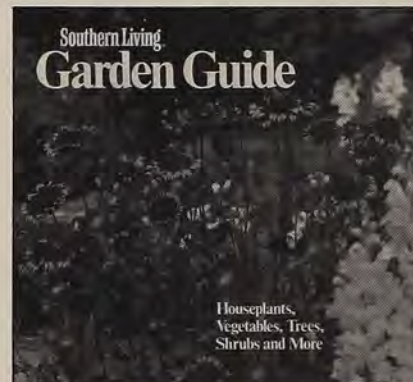
Here are 48 unusual vegetables you can grow in your garden. This delightful book gives a brief history, cultural instructions and cooking directions for a whole host

of really different garden vegetables. Most of them have been around for a long time, but they are often relegated to the status of one-line listings in the same catalog that has five pages of tomato varieties. A list of seed sources guarantees the availability of even the most unusual. This new paperback edition is a selection of the best material from an earlier hardcover publication, *Unusual Vegetables*.

OF REGIONAL INTEREST

SOUTHERN LIVING GARDEN GUIDE.

John Alex Floyd, et al, Editors. Oxmoor House, Inc. Birmingham, Alabama. 1981. 224 pages; hardbound, \$17.95. AHS discount price, \$14.30 including postage and handling.



THE NATURAL HISTORY OF WILD SHRUBS AND VINES (EASTERN AND CENTRAL NORTH AMERICA).
Donald W. Stokes. Harper and Row. New York, New York. 1981. 246 pages; hardbound, \$16.95. AHS discount price, \$13.10 including postage and handling.

ORNAMENTAL SHRUBS FOR USE IN THE WESTERN LANDSCAPE.

Emile R. Labadie. Sierra City Press. Sierra City, California. 1980. 311 pages; hardbound, \$13.00. Softbound, \$9.95. AHS discount price, \$12.30 hardbound; \$9.70 softbound including postage and handling.

Produced by the garden and landscape staff of *Southern Living* magazine, the *Garden Guide* is aimed at the beginning gardener. With major sections on annuals and perennials, bulbs, vegetables, etc., the book covers all aspects of gardening in the South. The text is organized as a series of questions and answers intended for casual reading, but a very complete index also

With food prices going sky high, an old gardener found a new way to beat the high cost of grocery store produce:

SOLAR POWERED MINI GREENHOUSES!

BY ELIZABETH FISHER

I've been growing vegetables for about 25 years. When I first saw the ad that claims a family can grow their own vegetables year 'round with a miniature greenhouse that uses no artificial light or heat, I was very skeptical. I thought to myself—how can that be? That's impossible. It takes a big, expensive greenhouse. It takes a big set up with lots of artificial light and heat to grow vegetables in freezing cold weather. But my curiosity kept nagging me, so I sent off for the information.

My uncle is a gardener over in West Virginia. I showed him the GUARD 'N GRO literature. His first reaction was "I don't believe it! I don't believe a small, portable greenhouse can make plants grow in freezing cold weather without any artificial light or heat!" But the more I studied it, the more it sounded like a good idea.

FOOD PRICES CLIMB

Another thing on my mind was the price of grocery store vegetables. We're having the biggest increase here since I can remember. Prices for store-bought vegetables are going through the roof. It's very hard on a lot of folks, but backyard gardeners are saving money by growing their own vegetables. I'd been thinking about growing more vegetables, but with the colder weather coming on, I was afraid my crops would not survive the frost and freezing cold. I decided to see if GUARD 'N GRO would protect my plants from those cold temperatures.

EASY SET UP

Now, when I started growing vegetables 25 years ago, I used homemade cold frames to protect my plants in cold weather. But these cold frames were bulky and a real chore to put together. Later, I switched to vinyl sheets stretched over metal hoops, but even that took a lot of work to set up. You can't imagine how I felt when they delivered my GUARD 'N GRO. It was so compact, very simple. I took it out and set it up in just a few minutes.

SAVES MY CROPS

The first time I used GUARD 'N GRO in my garden I was all fixed to put electric heating coils inside GUARD 'N GRO and give my plants plenty of protection. However, it was a very cold season—temperatures that Fall dropped below freezing many times at night—and the first frost caught me by surprise. Almost without warning, the temperature plunged to 26° one night. It was so cold that ice formed on the pond! Well, I was sure my plants were ruined. Imagine my surprise when I looked inside my GUARD 'N GRO! Even though it was freezing cold outside, my GUARD 'N GRO plants were doing beautifully. They were not harmed by the freezing cold that killed crops outside GUARD 'N GRO! Without any artificial light or heat, GUARD 'N GRO saved my plants.

The secret is a network of thermal air cells sealed between each GUARD 'N GRO solar



panel. Developed by a gardener in California, these energy-saving, thermal air cells trap and seal in solar heat to provide a constant, warm growing climate for plants. This warm climate makes plants grow faster and bigger than crops grown outside GUARD 'N GRO. From the information kit sent to me by the GUARD 'N GRO folks, I learned that GUARD 'N GRO works even in cold climates. It has produced superb results in Minnesota, Michigan, Colorado and Iowa. 16,300 GUARD 'N GRO systems are now being used by gardeners in 46 states.

SAVES MONEY

That Winter, I picked lettuce, carrots and spinach from my GUARD 'N GRO garden on Christmas day. This wonderful invention saved my plants from killing frosts, freezing cold, hail, sleet and high winds. With GUARD 'N GRO I grew cool weather crops like lettuce, carrots, broccoli, spinach, beets, brussel sprouts, cauliflower, onions and broad beans...and did away with buying these vegetables in stores. GUARD 'N GRO let me grow vegetables in freezing cold weather...without using any artificial light or heat. And that's what it takes to save money growing your own vegetables in cold weather.

GOOD FRESH VEGETABLES

I believe anyone can grow vegetables with GUARD 'N GRO. Even if you just want to have a small garden, you'll save money. It's simple and easy if you just read the instructions. And the best thing about it is you get fresh, rich tasting vegetables and salad greens without all those chemicals in them, and the vegetables cost you only pennies. You certainly can't buy grocery store vegetables for that. And it's a great feeling to have all the vegetables you want—even in winter—when everyone else is paying sky-high prices for vegetables in stores.

The man who invented GUARD 'N GRO really knew what he was doing. Modern technology is a wonderful thing, isn't it?

NOTE: Readers of this publication can get a fact-filled, illustrated information kit on the GUARD 'N GRO including a free trial offer. The information kit is available free, without obligation. Requests should be addressed to GUARD 'N GRO, Dept. AH 8, St. James, New York 11780.

Year 'Round Gardener

Save Hundreds of Dollars



WHY PAY OUTRAGEOUS PRICES

for grocery store vegetables when you can grow your own vegetables almost every month of the year with GUARD 'N GRO mini greenhouses? No artificial light or heat needed. 100% solar powered. Makes plants grow big and fast...even in 22° cold. Works year 'round. Cuts your food bills year 'round. For porch, patio, backyard or small space container gardening. Folds flat for storage. Mail coupon for startling facts and FREE TRIAL OFFER.

Not Sold In Stores

GUARD 'N GRO

Dept. AH 8 St. James, NY 11780



Yes! Rush me my FREE GUARD 'N GRO fact kit and details about how I may try GUARD 'N GRO this Fall and Winter without risking a penny. I understand I'm under no obligation and no salesperson will call.

Name _____

Address _____

City _____ State _____ Zip _____

Prune Your Own Trees WITH A

SNAP-CUT®

SEYMOUR SMITH & SON, INC.

TELESCOPING FIBER GLASS POLE Tree Pruner



Save a bundle by doing your own tree pruning. Up to 17 foot reach, strong fiber glass poles, fast and easy cutting up to 1½" limbs, 16 inch saw blade for bigger stuff. Teflon-S® coated blades won't stick, gum-up or rust. A great, money saving tool!

SEYMOUR SMITH & SON, INC.

Better Garden Tools Since 1850
Oakville, Conn. 06779

PRUNING SHEARS ■ GRASS SHEARS
HEDGE SHEARS ■ LOPPING SHEARS
PRUNING SAWS

DO NOT USE THESE TOOLS NEAR
ELECTRICAL WIRES.
USE ONLY WHILE STANDING FIRMLY
ON DRY LAND.

BOOK REVIEWS CONT'D

enables the book to be used as a reference work. Recommendations of specific cultivars for the lower, middle and upper South are particularly useful.

**Save time and money—
Order books available
at a discount through the
Society.**

The Natural History of Wild Shrubs and Vines is a series of essays on field observations of the ecology and growth habit of 49 genera of wild shrubs and vines. The author takes the reader on a walk through the woods and fields at all seasons of the year. A keen observer and a trained naturalist, he points out many details that a casual observer might miss. The lovely line drawings by Deborah Prince Smith record many of these observations and occasionally help to distinguish between related species. This book is highly recommended for the nature lover and the wild gardener.

Ornamental Trees and Shrubs is generally of use throughout the West Coast and specifically in the San Francisco Bay Region. One hundred and twenty-five of the more widely grown and best adapted trees and shrubs are described and illustrated. Although the telegraphic style of the descriptions may grate upon the nerves of some readers, the organization of the data provides all the information needed for each species. Jane Andrews' line drawings provide both details of flowers and branches and an excellent overall portrayal of the growth habit of each plant.

PLANT HEALTH HANDBOOK.

Louis Pyenson. AVI Publishing Company. Westport, Connecticut. 1981. 241 pages; hardbound, \$19.50 (\$21.50 in Canada). AHS discount price, \$17.80 including postage and handling.

This book is about pests and pest control for the home gardener. It covers all phases of plant health, including mineral deficiency as well as the more usual insect pest and weed problems. Biological controls are treated only briefly; most of the solutions offered fall in the area of chemical pest control. A great deal of attention is paid to the proper identification of the pest organism and the safe use of chemical controls. Chapters on general garden pests, lawns, house plants, deciduous trees and shrubs, evergreens, flowers, vegetables and

fruits simplify the use of this book by arranging the pests according to their host plants. Many photographs and clear line drawings further aid in identifying the organism causing the problem. A brief explanation of government regulations in the use of pesticides should be of special interest. This is an informative reference work directed specifically at the home gardener.

THE ENGLISH GARDEN.

Laurence Fleming and Alan Gore. Michael Joseph. London, England. 1979. 256 pages; hardbound, \$24.95. AHS discount price, \$21.20 including postage and handling.



This well illustrated history of English gardens has a text that moves right along—not strange when you realize that this is the book version of a television series which appeared in England. From prehistoric times to the present day, this book concisely covers the gardens, the men and women who made them and the plants they used. It is enjoyable and informative reading, so much so that I now want to see the original television version. ♦

—Gilbert S. Daniels

Gilbert S. Daniels is the President of the American Horticultural Society.

Instructions for ordering books by mail:

Send orders to the attention of Dorothy Sams, American Horticultural Society, Mount Vernon, VA 22121. Make checks payable to the Society. Virginia residents, add 4% sales tax. When a discount price is not listed for a book, please add \$1.25 to the price listed to cover the cost of mailing and handling.



VAN BOURGONDIEEN'S DOLLAR SPECIALS

We Are Happy To Make Bargain-Rate Offers Of Holland Grown Bulbs To Make New Friends



SPECIAL \$1.00 SALE

● Indicate selections desired on coupon below and mail today!



Early Snow Crocus. Early bunch-flow-ering crocus. Mixed colors of yellow, purple, orange.
#4900-8/\$1.00; #4901-24/\$2.50



Red Fire Tulips. Giant fire-red Darwin Hybrid tulips on stems 24" tall. Bloom April-May.
#4902-8/\$1.00; #4903-24/\$2.50



Glory of the Snow. (Chionodoxa). Sky blue flowers with white centers, for naturalizing.
#4904-8/\$1.00; #4905-24/\$2.50



The Love Tulip. (Marjoletti). Lovely cream-white with soft pink stripe. Late May, 16" tall.
#4906-8/\$1.00; #4907-24/\$2.50



Grape Hyacinths. (Muscari). Blue flowers in grape-like clusters for naturalizing. April-May.
#4908-15/\$1.00; #4909-45/\$2.50



Scarlet Emperor Lily. The brightest scarlet red flowers of large size. Blooms abundantly in June.
#4965-1/\$1.00; #4966-3/\$2.50



Waterlily Tulips. Low growing tulips of cream-yellow with bright rose-red markings.
#4912-6/\$1.00; #4913-18/\$2.50



Star Flowers. (Triteleia). Abundant low-growing sweet scented pale lilac flowers for rockgardens.
#4914-15/\$1.00; #4915-45/\$2.50



Blue Mt. Lilies. (Ixiolirion). Hardy clusters of sky-blue lily-like blooms 15" tall in June.
#4916-8/\$1.00; #4917-24/\$2.50



Hardy Anemones. (Blanda). A color-mix of star-shaped blue, pink, white flowers in early spring.
#4918-6/\$1.00; #4919-18/\$2.50



Giant Hyacinths. Mixed colors of vivid reds, blues, yellows, pinks, whites. Fragrant 10" blooms.
#4920-3/\$1.00; #4921-9/\$2.50



Giant Daffodils. Large yellow trumpet daffodils for gorgeous spring beauty. 14-16" tall, April.
#4922-6/\$1.00; #4923-18/\$2.50



Bouquet Tulips. (Firespray). Blazing carpet of scarlet red tulips only 9" tall. 3-5 blooms per bulb.
#4924-6/\$1.00; #4925-18/\$2.50



Drumstick Allium. Giant ball-shaped overlapping petals with large orange-red crown. Very striking blooms.
#4948-4/\$1.00; #4949-12/\$2.50



Red Queen Daffodils. Ruffled white overlapping petals with large orange-red crown. Very striking blooms.
#4948-4/\$1.00; #4949-12/\$2.50



Dwarf Dutch Iris. (Reticulata). Sweet scented early blooming miniatures. Multiply, for naturalizing.
#4928-6/\$1.00; #4929-18/\$2.50



Cardinal Tulips. (Eichleri). Flaming cardinal-red tulip in waves of green foliage. Low beds, borders.
#4930-8/\$1.00; #4931-24/\$2.50



Charisma Lily. Brilliant fiery orange blooms of large size on strong stems. Hardy, blooms June-July.
#4963-1/\$1.00; #4964-3/\$2.50



Peacock Tulips. Showy full-open tulips. Bright colors and bold markings, striped foliage. Unusual.
#4934-6/\$1.00; #4935-18/\$2.50



White Snowdrops. (Galanthus). Charming small bell-like flowers in abundance. February-March blooms.
#4936-10/\$1.00; #4937-30/\$2.50



Parrot Tulips. Mixed colors. Large flowers with exotic shapes, colors and designs. Bloom in May.
#4938-4/\$1.00; #4939-12/\$2.50



Winter Aconite. (Eranthis). Golden yellow buttercup-like flowers February, March, April. Only 3-6" tall.
#4940-10/\$1.00; #4941-30/\$2.50



Wood Hyacinths. (S. Campanulata). Clusters of bell-shaped flowers. Mixed colors of pink, white, blue.
#4942-6/\$1.00; #4943-18/\$2.50



Daffodil, Ice Follies. Unusual variety. Lovely pure white petals with large ruffled, creamy yellow crown.
#4961-5/\$1.00; #4962-15/\$2.50



Golden Jonquils. (Lobularis). Daffodil-like flowers of rich golden yellow in abundance, very fragrant.
#4950-4/\$1.00; #4951-12/\$2.50



Conn. Yankee Lily. Best new apricot-orange. Long blooming variety. 4 ft. tall, blooms July-August.
#4967-1/\$1.00; #4968-3/\$2.50



Hardy Cyclamen. (Neapolitanum). Lovely soft reddish pink blooms in abundance. For sheltered rockgarden.
#4958-1/\$1.00; #4959-3/\$2.50



Paperwhite Narcissus. Clusters of pure white star-shaped flowers, fragrant long lasting house plant.
#4956-4/\$1.00; #4957-12/\$2.50



Sweet Gardenia Daffs. Dainty white Gardenia-like double daffodils with lovely fragrance. Cluster flowers.
#4944-4/\$1.00; #4945-12/\$2.50

Write for **FREE CATALOG**

A beautiful full-color book of over 1000 rare and unusual flowers, plants, trees and imported bulbs.



POSTPAID & GUARANTEED

Van Bourgondien Bros., Box A-AH 8 Rt. 109, Babylon, NY 11702

Fill out and mail coupon below

Van Bourgondien Bros., Box A-AH 8 Babylon, NY 11702

Please send me the "bargain-offer" items I have checked below.

Check Items Below For Purchase

- Snow Crocus
- 4900-8/\$1.00
- 4901-24/\$2.50
- R. Fire Tulips
- 4902-8/\$1.00
- 4903-24/\$2.50
- Glory of Snow
- 4904-8/\$1.00
- 4905-24/\$2.50
- Love Tulip
- 4906-8/\$1.00
- 4907-24/\$2.50
- Gr. Hyacinths
- 4908-15/\$1.00
- 4909-45/\$2.50
- S. Emperor Lily
- 4965-1/\$1.00
- 4966-3/\$2.50

- Wat-lily Tulips
- 4912-6/\$1.00
- 4913-18/\$2.50
- Star Flowers
- 4914-15/\$1.00
- 4915-45/\$2.50
- B. Mt. Lilies
- 4916-8/\$1.00
- 4917-24/\$2.50
- H. Anemones
- 4918-6/\$1.00
- 4919-18/\$2.50
- G. Hyacinths
- 4920-3/\$1.00
- 4921-9/\$2.50
- Giant Daffs
- 4922-6/\$1.00
- 4923-18/\$2.50

- Bouquet Tulips
- 4924-6/\$1.00
- 4925-18/\$2.50
- Drum Allium
- 4926-8/\$1.00
- 4927-24/\$2.50
- Red Q. Daffs
- 4948-4/\$1.00
- 4949-12/\$2.50
- Df. Dutch Iris
- 4928-6/\$1.00
- 4929-18/\$2.50
- Cardinal Tulips
- 4930-8/\$1.00
- 4931-24/\$2.50
- Charisma Lily
- 4963-1/\$1.00
- 4964-3/\$2.50

- Peacock Tulips
- 4934-6/\$1.00
- 4935-18/\$2.50
- W. Snowdrops
- 4936-10/\$1.00
- 4937-30/\$2.50
- Parrot Tulips
- 4938-4/\$1.00
- 4939-12/\$2.50
- W. Aconite
- 4940-10/\$1.00
- 4941-30/\$2.50
- Wo. Hyacinths
- 4942-6/\$1.00
- 4943-18/\$2.50
- Daf. I. Follies
- 4961-5/\$1.00
- 4962-15/\$2.50

- Gold Jonquils
- 4950-4/\$1.00
- 4951-12/\$2.50
- C. Yankee Lily
- 4967-1/\$1.00
- 4968-3/\$2.50
- H. Cyclamen
- 4958-1/\$1.00
- 4959-3/\$2.50
- Paperwhite N.
- 4956-4/\$1.00
- 4957-12/\$2.50
- Gardenia Daff
- 4944-4/\$1.00
- 4945-12/\$2.50

Amt. Enclosed \$ _____

EXTRA BONUS DISCOUNTS

- Orders \$ 5.00 to \$ 9.99 5% Discount
- Orders \$10.00 to \$19.99 10% Discount
- Orders \$20.00 to \$29.99 15% Discount
- Orders \$30.00 and over 20% Discount

Please send me your new Free Catalog.

Name

Address

City

State Zip

New York State Residents Add Sales Tax

The Cold Frame

Inexpensive to build and easy to maintain, cold frames can help you get a head start on spring. But they have many other uses as well, as author Mary Ann McGourty explains.



For some time we considered building a cold frame but never got around to finding answers to our questions about the project. How big should it be? How much would it cost? Where would we place it? We always thought we'd build one some day. Then, a few years ago, two seemingly unrelated incidents spurred us into action. First, several of our conventional storm windows and sashes were converted to modern triple-track combinations, and in addition, one sad April day we discovered that all our favorite chrysanthemums had been winter-killed—again. Some day had arrived!

A little investigation into the how-to of building and managing a cold frame convinced us that we could indeed use one to

Mary Ann McGourty is the proprietor of Hillside Gardens, a perennials nursery in Norfolk, Connecticut.

good advantage. As gardeners, my husband and I have a strong interest in perennials, but we grow a number of annuals and vegetables too. We also happen to live in the harsh hill country climate of northern Connecticut, where winter comes early and stays and stays like the man who came to dinner. The snow averages 100 inches a year, and it is usually driven by icy Arctic blasts that test the mettle of even the hardiest perennials. The growing season is short — just 110 frost-free days a year—so a cold frame could help us get a head start with annuals and vegetables.

For centuries gardeners have been trying to outwit Mother Nature. In Roman times plants were grown successfully in pits covered with sheets of mica and heated by fermenting manure. After glass windows came into general use, around the turn of the 17th century, orangeries and other glass buildings of huge proportions were con-

structed to protect fruit trees and other tender plants from the European winters. Some even had open fires inside to ward off the cold. The development of elaborate greenhouses by the wealthy was paralleled on a smaller scale by the development of smaller, glass-covered structures. Drawings from the mid-17th century show cold frames that are remarkably similar to our own.

HOW TO BUILD IT

A cold frame is basically a bottomless box built over a pit or set directly on the ground and fitted with a clear protective cover. It may be as simple or as elaborate as gardeners' needs and pocketbooks dictate. A frame can range from the cost of a sheet of plywood and a few bits of hardware with a second-hand storm window for a top, to an elaborate, excavated model with masonry walls, a buried heating cable

TEXT BY MARY ANN MCGOURTY
ILLUSTRATIONS BY ROBYN JOHNSON ROSS

and a thermostatically controlled venting device.

The two most important considerations in locating a cold frame are available sunlight and drainage. To get the maximum benefit of available heat and light the frame should face south; a southeast or southwest exposure is next best. A site next to a fence, building or hedge will give some protection from icy winter winds. Our frame is located two feet from the south wall of our house, which makes it accessible to the water supply, and we can keep a close eye on the plants in all seasons. The space between the frame and the house allows us to remove the sash without becoming contortionists.

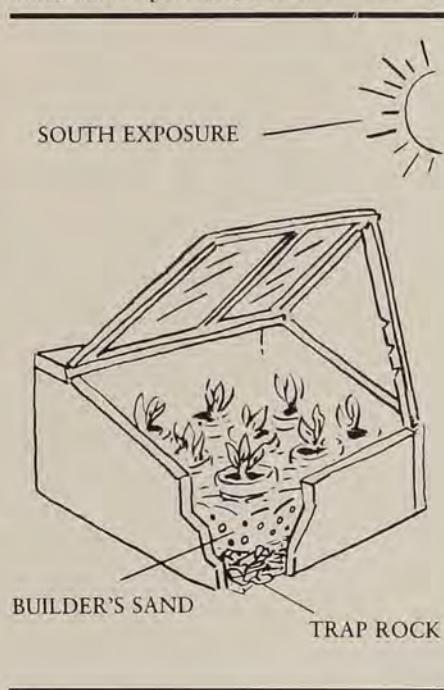
The cold frame should be located on ground that is fairly level and free of stones, not an easy accomplishment in New England. It is essential that the area have good drainage. Water should not be allowed to accumulate near a cold frame, even after heavy rains. Standing water, especially in winter, quickly turns a cold frame into a glass-covered plant coffin. As a noted gardener once said, good drainage never hurt anything except a sphagnum bog.

A cold frame can be any size. The size of ours was determined by the storm sashes we used for its top. It is three windows long. A width of three feet seems about right, as we can still reach plants in the back without stepping into the frame. Also, larger sashes are too heavy for easy handling.

Our frame is built over a dug foundation, because a surface unit or portable frame does not provide reliable protection for over-wintering plants in the cooler parts of the country. The foundation was dug to a depth of two-and-one-half feet to add drainage material and still allow adequate headroom for the plants. The excavated foundation itself gives some protection for plants, but in our cold frame a concrete block liner, cemented in place, provides additional insulation and a base on which to attach the frame. Our foundation extends eight inches above ground so that the frame resting on it is less subject to rot. This way, pests have more difficulty gaining access to the tasty young plants, too. This is also an important consideration in areas where termites are a problem. Into the bottom of the pit we put six inches of trap rock for drainage and covered it with eight inches of builder's sand in which to sink pots.

In building the frame it is wise to use the best decay-resistant, seasoned wood available. Use a one-inch thickness. To

determine the proper height of the frame, consider the amount of headroom needed for the kinds of plants you will be growing. A deeper frame cuts out more light than a shallow one but can accommodate taller plants. Rock gardeners may settle for more shallow frames than growers of young trees and shrubs. In any case, the back of the frame should be six inches higher than the front, so that the sashes slope to catch as much sun as possible, and to allow water



to drain off. A two-by-four inch board bolted to the concrete blocks holds the frame in place. In our frame the front of the sash rests directly on the two-by-four, and the back is six inches higher. This gives 18 inches of headroom in the front and 24 inches in the back, which is adequate for most annuals, perennials and vegetables. The corners are strengthened with L-brackets, and crossies extend from back to front at three-foot intervals to provide additional support for the sashes. The frame should have a wood preservative finish inside and out. Cuprinol is a good choice. Do not use a creosote-base finish, as it is toxic to plants.

The sashes are attached to the cold frame by hinges with removable pins. The same window renovation that provided us with surplus storm sashes also produced obsolete screens, which we use to replace the glass in summer. This keeps leaves and grass clippings out of the frame and also makes the area off limits to the family cats, who seem to think anything that resembles a sandbox is fair game. Sashes should extend slightly beyond the lower front edge,

so water will run off the frame instead of into it. A simple handle attached to the front edge is useful, and long screen door hooks on the edge with corresponding eyes on both the front of the frame and on the wall behind will keep the top from being tossed around by errant spring winds. In the absence of old storm sash, fiberglass or heavy-mil polyethylene can be used for tops. Both are lightweight, but there is some loss of light transmission.

HOW TO MANAGE IT

An inexpensive thermometer, placed on an inside wall of the frame where the sun will not shine directly on it, will be helpful in temperature management. With the sash closed, the frame is essentially a passive solar collector. The closed environment can collect and hold great amounts of heat, even on cloudy days. One must be especially careful of days in late winter and early spring when the air is still chilly but the sun is bright. Begin raising the sash when daytime temperatures range above 50° F, a few inches at first, then more as the days become warmer. Lower the top before the temperature begins to drop in the afternoon. The object is to keep the plants from cooking but not to chill them.

Good ventilation also prevents the excess moisture that encourages damping off of young plants. To avoid trouble with fungal diseases, we try not to water in cool, cloudy weather. Watering is best done early in the day so that leaves will dry before frames are closed up for the night.

In early spring it is possible to supplement heat in the frame on chilly nights by stacking old bricks against the north wall or lining up plastic jugs filled with water. These absorb heat during the day and release it slowly at night, giving additional protection. Heat absorbency of the jugs or bricks can be enhanced by painting them with flat black paint. The stumbling block of this technique for most gardeners is that there never seems to be enough room in the frame for the jugs!

In the old days plants were raised directly in a growing medium placed over the drainage material in the frame. The usual recommendations were for at least six inches of good loam with sharp sand and organic matter added and pH corrected with dolomitic limestone, if necessary. Today, most people prefer to grow plants in individual pots or flats. These are sunk to their rims in the eight inches of sand that covers the drainage material. This helps control the introduction of fungus or soil diseases. Disease organisms can

Controlling The Temperature in a Cold Frame

Until recently the usual way to control temperatures in cold frames has been to wear a path back and forth to the frame and prop the lid open with a stick. This method works until the day someone forgets to do it and plants get cooked or frostbitten. With the invention of the non-electric, thermostatically controlled sash prop, all this has changed. This ingenious device, which automatically opens the sash when the interior temperature reaches 72° F and closes it at 68°, can be ordered from

George W. Park Seed Co., Greenwood, SC 29647, as the SolarVent Greenhouse Window Opener. Park also offers the Vent O'Matic cold frame, which is a complete above-ground unit equipped with the thermostatic device. Bramen Co., Inc., P.O. Box 70, Salem, MA 01970 sells Thermoform, an automatic prop which operates at any temperature you select between 55° and 85° F. One point to remember, though: the controller must be disconnected before the top can be opened completely.

march through the close quarters of a cold frame like Sherman marched through Atlanta, with similar results. Another advantage of pot culture is that soil mixes can be tailored to suit the needs of individual plants. Sedums can grow cheek by jowl with ferns, individual plants can be removed without disturbing their neighbors, and pots can be shifted around to get more or less sun and to make best use of space. Plants should be inspected for pests before they are placed in the frame, and bottoms of pots checked especially for hitch-hiking slugs.

HOW IT USE IT

A cold frame is thought of most frequently in connection with winter protection of plants, but this is only one of its many uses. In areas of the country having a short growing season, wise use of a cold frame can extend the active outdoor growing season by at least three months.

Seeds of hardier vegetables and perennials can be sown in the frame, either in flats or directly in the soil, two months before the last spring frost is expected or in late winter. When the soil is warm enough, they will germinate and grow. We use our frame in conjunction with fluorescent lights. Plants that can take a little cool weather are started indoors under lights and then moved to the cold frame after their first transplanting. This frees up space for more tender plants under the lights, gives transplants more growing room and eliminates the soft, rank growth often associated with plants grown indoors at higher temperatures. As spring becomes settled, tender plants can be moved out for hardening off. The frame protects them from sudden temperature changes in the transition from warm conditions indoors to their place in the garden.

Perennials can be sown in a cold frame from early spring through late summer, depending on the climate. We carry young perennials through their first year in the frame before exposing them to the cold, cruel world of a New England winter. With this method, we have had minimal winter losses. During their seedling summer, some perennials will need protection from direct sun. Our old window screens are effective, but a piece of snow fence or some similar material can be placed over the frame with equally good results. Cuttings rooted in summer can be shaded in a similar manner.

Autumn is the time to move pots of a few perennials of questionable hardiness to the frame for winter protection. Chrysanthemums held over this way make excellent stock plants for spring cuttings or divisions. A warning, though—do not fall into the trap of coddling too many favorites, or you will end up moving your entire garden under cover for the winter.

Late autumn planting of perennials in the open is not recommended for our area, as plants do not have time to get their roots anchored into the soil before the ground freezes. As a result, they become subject to frost heaving and root desiccation. Any late arrivals on our gardening scene spend their first winter camped out in the cold frame before moving to the garden the following spring.

Seeds of perennials can also be sown in late autumn. The object is not to start seeds growing, but to give them the cold treatment many require for good germination. They will then germinate early in spring and have a head start over spring-sown seeds. Sow seeds in flats just before the ground freezes so they will have no chance to sprout before winter sets in.

Assuming the frame isn't filled wall-to-wall, an autumn crop of salad greens can

be planted—lettuce, spinach or other favorites. Seeds sown around Labor Day will yield good crops until early winter, if a sharp eye is given to watering and temperature control.

Plants in a cold frame need water later in autumn than one might expect since the soil does not freeze as quickly as that outside. Make sure plants are well watered before they are tucked in for their long winter's nap. And add some pellets of rodent bait too, in case resident mice or chipmunks decide they need a midwinter snack.

For harsh climates some gardeners recommend banking soil or bags of leaves or hay around the frame as extra winter protection. We have not found this necessary; it may, in fact, harbor unwanted rodent visitors. Our plants have safely survived some very cold temperatures. On Christmas Day 1980 the reading on our back porch was a bracing -25° F with a wind chill factor of -80° F, and this spring we found only two plant corpses in the frame.

Winter chores are minimal. Heavy snows must be kept off the glass and the frame must be inspected every few weeks for soil dryness. Water sparsely, if at all.

When the season for browsing through next year's seed catalogs has arrived, it is time to start salad greens again. Seeds sown in late winter will be up and growing at the first sign of spring, long before the soil in the garden is warm enough or dry enough to cultivate. We just dig out the remains of the Thanksgiving lettuce, resow and retire to the fireside to wait for spring peepers and lettuce seedlings to announce the arrival of mud season, the forerunner of spring. Leaves of young greens can be harvested as needed and the plants moved to the garden later.

There are two variations of the cold frame that should be considered. The portable frame is simply a bottomless box with a clear top that is placed on the surface of the soil or on a terrace, where it can absorb warmth from the stones. It is used primarily to start tender plants directly in the garden and to harden off seedlings started indoors. Its main advantage is portability, as it can be set up on site, then disassembled and stored flat when not in use. Plans for a collapsible cold frame using only half a piece of plywood and a few hinges are given in *Time-Life Encyclopedia of Gardening—Vegetables and Fruits*, by James Underwood Crockett and Editors of Time-Life Books, 1972. Another plan appeared in the January, 1981 issue of *Organic Gardening* magazine. It is a good idea to raise the portable frame an inch or so off

Continued on page 39

RHODODENDRON GARDENS



George Baetjer

Rhododendrons in bloom in August? It happens in Seattle. Even if the varieties you grow only make their showy display in the spring, we thought you would enjoy being introduced to the two special rhododendron gardens described on the next four pages. Primarily the work of volunteers, these gardens should be added to your itinerary whenever you plan a visit to the Pacific Northwest.

Crystal Springs

BY GEORGE BAETJER

Portland, Oregon is often called one of America's most "liveable" cities. Although there is no doubt that its popularity is due in large part to the unspoiled countryside that surrounds it, many outsiders aren't aware of the many places where beautiful scenery can be enjoyed within its boundaries. Portlanders are justifiably proud of their parks. From the wild, undeveloped beauty of Forest Park, over seven miles in length and the largest within any American city, to the formal grace of its Japanese Gardens, Portland's park system encompasses more than 7,200 acres and offers settings to please any taste.

Crystal Springs is small by local standards, but it is certainly one of the most stunning parks in all the Northwest. It was established in 1950, when members of the American Rhododendron Society decided to create a test garden where specimens of their favorite plant could be compared for hardiness, quality and growth under local conditions. In that year, C.I. Sersanous, the president of the Rhododendron Society, and Paul Keyser, the Superintendent of Portland Parks, inaugurated a fruitful partnership that has been maintained to the present day.

By a special city ordinance, six acres of land bordering the Eastmoreland golf course were set aside as the site of the park, which was known then as the Rhododendron Test Garden. The property consisted of two peninsulas connected by a long footbridge over a part of Crystal Springs lake, for which the park is now named. This rolling land, shaded by Douglass fir (*Pseudotsuga menziesii*), oak and mountain dogwood (*Cornus nuttallii*), was an ideal setting for rhododendrons and azaleas. The initial planting at the test garden consisted of 40 specimens of rhododendron. Many of these plants are still thriving today, more than 30 years later.

The garden has never stopped expanding since the original planting. Present day visitors to Crystal Springs can stroll through acres of beds that hold more than 2,500

rhododendrons, azaleas and "azaleadendrons" (all members of the genus *Rhododendron*). The mild winters and damp climate of the region are perfectly suited to these plants, which reward the eye with a profusion of colorful blossoms each spring. From mid-April to mid-May the garden is a truly spectacular sight.

Mother's Day weekend marks the height of the "season" at Crystal Springs. Every year at this time, when the floral display of the garden is at its peak, the Rhododendron Society holds its flower show and plant sale. Last year, over 5,000 people paid a modest admission fee to see a remarkable display of rhododendron trusses entered in competition by gardeners from all over the region. The proceeds from the event, now a long-standing Portland tradition, are used to fund further improvements to the garden.

Like many of our invaluable cultural institutions, Crystal Springs is maintained largely through the efforts of a group of dedicated volunteers. Although the city provides the land rent-free and the services of one full time maintenance worker, nearly all of the planning, planting and propagation at the garden are done by Rhododendron Society members who donate their time and muscle power one day each week. They also offer a number of interpretive services free of charge to interested people from the community.

One of the programs conducted by society members at Crystal Springs is the Master Gardener course. Using materials developed with the help of the Oregon State University Extension Service, the dedicated gardener can benefit from a "hands-on" mini-course that provides a wealth of information on the planting and care of rhododendrons and azaleas. Printed materials are available that deal with specialized information relating to the control of diseases and insect pests. Guided tours are also offered for garden clubs and civic organizations. Conducted by members of the Garden Committee, these tours pro-

Continued on page 42

George Baetjer is a professional photographer with interests in environmental design and portrait photography.

Crystal Springs garden gets its name from the Portland lake around which azaleas and rhododendrons have been grown for display.





Rhododendron Species Foundation

BY JANE SANSREGRET

If plants could talk the Rhododendron Species Foundation garden, located between Seattle and Tacoma, Washington, would be a babel of legend and lore recounting a saga of survival and a history of discovery. Begun in 1976, the garden combines the natural setting of an open woodland with plants set out according to the geography of their native lands. More than 20,000 plants representing over 450 species of *Rhododendron* from many parts of Asia, Europe and North America flourish here in the mild maritime climate of the Puget Sound Region.

Growth habits ranging from matted groundcovers through medium-sized shrubs to small trees serve to illustrate each species' adaptations to diverse growing conditions in the wild. Differences in leaf size, shape and coloration also emphasize the adaptations these plants have made to survive in their native environment. Flower size ranges from one-half inch to more than six inches, and blossom colors mix tints and shades of reds, yellows and near-blues against pure white. On the flowers of some species markings in a contrasting color add interest, and sweet smelling perfumes scent many blooms.

The Rhododendron Species Foundation was formed in 1964 with the aim of preserving, propagating and distributing as many of the best varieties and forms of rhododendron species as can be maintained in cultivation. In the beginning, the collection was cared for in private gardens, but the number of plants soon outgrew available space. The garden's present 23-acre site was set aside by the Weyerhaeuser Company on the grounds of its corporate headquarters. In addition to giving the Foundation a long-term lease agreement, the company developed the property by selectively clearing and contouring the land. Additions of forest duff, fir sawdust and fertilizer were made to condition the soil. An irrigation system was installed and

electric power was connected. Also, the company provided funding for roads and paths together with a combination office-service building, a greenhouse and a large lath house. Further development and maintenance of the property is the responsibility of the Foundation, but Weyerhaeuser continues to furnish water, electricity and upkeep of the roads.

There are approximately 800 species of *Rhododendron* in the world and many naturally occurring varieties and forms, about half of which are hardy in the Pacific Northwest. Most of the plants in cultivation originated in China, Tibet, Burma and Japan. In the rugged areas of these Asian countries plant hunting expeditions were filled with adventure; some ended in disappointment and disaster. Each species represented in the garden could almost certainly tell a different and exciting story of discovery.

Only the finest varieties and forms of each species, as identified by qualified botanists, are included in the garden's collection. Private and public gardens in Britain, where species from early plant-hunting expeditions have been carefully preserved, sent cuttings to start almost half of the collection. Many contributions from American gardens were supplied from imported nursery stock originating in Britain. Volunteer gardeners and local garden clubs helped plant the area and continue to give service for maintenance and public programs. Financial support for the non-profit organization is covered by membership dues, gifts and grants.

Landscape design for much of the garden emphasizes the geographical distribution of each species, and so, plants are grouped according to their country of origin. In one part of the garden a study area

Continued on page 41

A gazebo provides attractive ornamentation and shelter for visitors to the woodland setting of the Rhododendron Species Foundation garden. In the foreground, *Rhododendron orbiculare*, a native of China.

Jane Sansregret has been a free-lance writer on gardening subjects for 15 years.

Tea Relatives

BY JAMES A. DOVE JR.



Pamela Harper



Pamela Harper

TOP: Trunks of *Franklinia alatamaha* photographed at Planting Fields Arboretum. ABOVE: Flower of *Franklinia alatamaha*. OPPOSITE: Flower of *Stewartia malacodendron*.

Summer flowering plants for the garden are hard to come by, and gardeners looking for trees that bloom during the summer months will find few alternatives. Three genera of summer flowering trees and shrubs capable of filling this gap have long been neglected in American gardens—*Stewartia*, *Franklinia* and *Gordonia*. Like their relative, *Camellia*, these unusually beautiful plants are members of the tea family, Theaceae. Fortunately, they can be grown much farther north than their tender cousins and should be considered by gardeners looking for an unusual plant to accent their summer garden.

The genus *Stewartia* contains about eight species. Two, *S. malacodendron* and *S. ovata*, are native to the eastern United States. The remainder are found in eastern Asia and Japan. *Stewartia malacodendron*, commonly called silky camellia, is a shrub or small tree that can be found growing wild on the Coastal Plain from the extreme southern portion of the Delmarva Peninsula (Delaware, Maryland and Virginia's Eastern Shore) to eastern Texas. There are also several stands in the Piedmont area of North Carolina. This species is one of the first of the genus to flower. It blooms in mid-May in the Washington, D.C. area. Unlike many of the other species, it opens most of its flower buds all at once, giving a spectacular, if somewhat short-lived, display. The flowers, which can be four inches across, have white crepe paper-textured petals and a center cluster of blue anthers borne on purple filaments. They are followed by a rounded seed capsule that splits along five sutures, releasing angular, somewhat woody seeds. The bark is an attractive, smooth gray. This species is one of the most tender of the stewartias and is only hardy to Arnold Arboretum Zone 7 and in a few protected locations farther north along the coast. It suffered minor twig damage during the unusually cold winter of 1976-77 in my Maryland garden but has recovered remarkably well.

Stewartia ovata, our other native spe-

cies, is found primarily in the mountains from eastern Kentucky through Georgia and Alabama. There are also several isolated populations in Virginia and Florida. Commonly called the mountain camellia, this shrub or small tree is one of the latest of the stewartias to flower, and its three-inch blooms are borne in late June through July. Its cup-shaped white flowers have a central cluster of orange anthers borne on whitish filaments. The pistil or female part of the flower consists of a conical ovary and very distinctive five-parted styles. This characteristic distinguishes *S. ovata* from all other species of *Stewartia*, where styles are united and only the stigmas are separate. Another feature that is peculiar to this species is that the base of the leaf petioles completely conceal the terminal and lateral buds. The fruit is five-angled and pointed rather than rounded, as is that of *S. malacodendron*. *Stewartia ovata* has brownish, slightly furrowed bark. *Stewartia ovata* forma *grandiflora* is an exceptionally beautiful form that has larger flowers (to four inches) with orange anthers borne on purple filaments. In my opinion, this is the most attractive type, but it is extremely difficult to locate. Both the species and the *grandiflora* form are hardy to southern New England. Although most literature on stewartias states that *S. ovata* is the most commonly available species, plants that I have ordered from many reputable nurseries have proven to be one of the Asian or Japanese species instead.

The Japanese stewartia, *S. pseudocamellia*, is undoubtedly the most commonly seen species in American gardens. It is a tree that can reach a height of 50 feet, and its flowers are usually two to two-and-one-half inches in diameter. They are cup-shaped and borne over a long period in June and early July. The foliage takes on shades of purple in the fall. A similar species from Korea, *S. koreana*, usually has a larger, flatter (more open) flower and an orange-red fall foliage color. Otherwise, it is quite similar to the Japanese plant. Both the Korean species and *S. pseudocamellia* are hardy to Arnold Arboretum Zone 5.

Another Japanese species seen occasionally, especially in public gardens, is *S.*

James A. Dove, Jr. is the horticulturist at London Town Publik House and Gardens, Anne Arundel County, Maryland.

Continued on page 36





Swiss Gardens

BY DOROTHY KNECHT



Dorothy Knecht

Last fall's tour of Switzerland, sponsored by the American Horticultural Society, revealed to those of us who participated another side of Switzerland. In this country famed for its spectacular scenery and winter sporting areas, we also found a people highly skilled in all forms of horticulture. We saw experimental seed nurseries, botanical gardens, horticultural schools, arboreta, alpine gardens, city parks, private gardens, palatial gardens, windowboxes and the superb "Green '80." The latter was a spectacular horticultural exposition in Basel that had been 10 years in the making.

The members of our group came from as far apart as Mexico and Massachusetts. With us were two seasoned horticultural experts, Paul Freese and Harold Epstein. It was a blessing to have the "answer" men along.

Our tour began with a three-day stay in Zurich where we first visited the experimental garden of the Samen Mauser Company in nearby Arni. The Mauser Company used this location as a proving ground for seeds imported from other countries, as well as for developing its own hybrids. Once the seedlings were established, they were not watered or fertilized during the growing season. The purpose of such treatment was to see how the plants would fare with the minimum care the average gardener might give them. Only those seeds that promised to assure satisfactory performance in Switzerland were then selected for sale.

Although it was autumn by the calendar (September 26), a late spring and cool summer provided us with a "height of the summer" display of flowers and vegetables at the experimental garden. Even sweet peas were still in full bloom.

The next morning we visited Moorgarden, which contrasted sharply and strikingly with the brilliant sheets of color of the seed garden. Until 1953, when landscape architect Robert Seleger bought Moorgarden for his home, it was a 100-acre peat bog. Bit by bit Seleger drained the land by means of canals and ponds. Under a canopy of tall trees, 500 species and cultivars of rhododendrons and azaleas now thrive in this ideal soil.

Mr. Seleger had collected plants from all over the world and propagated them

in greenhouses for sale in the spring, when the gardens were opened to the public for four weeks. Mr. Seleger hybridized as well as collected plants. He also grafted certain rhododendrons to achieve a more compact form. We wandered along the winding paths of Moorgarden enjoying the variety of form and texture that makes the rhododendron such a desirable year-round architectural element in the garden.

A path down the sloping bluff leading to the harbor on Mainau wound first through a lush planting of over 180 varieties of rhododendrons and azaleas.

That afternoon we crossed the border into Germany to visit the Island of Mainau on Lake Constance (called Bodensee in German) owned by the Swedish Count Lennart Bernadotte. The count inherited the island in 1930 from his German-born grandmother, Queen Victoria of Sweden. He and his family make their home in the castle situated at the crest of the bluff at the eastern end of the island. The count is a skilled horticulturist and a past president of the German Horticultural Society.

The scale of the plantings at Mainau was astonishing, and the use of color was dazzling. The island has a 2,000-year history. The Romans used it as an outpost, and the Knights of the Teutonic Order later ruled there for 500 years.

Bernadotte's great-grandfather acquired the 110-acre island in 1853, and it was he who laid the foundation for the present arboretum. We saw particularly fine specimens of *Sequoia*, *Thuja*, *Cedrus*, and *Cryptomeria*.

Mainau is located at a latitude of 47° (corresponding to Maine and southern Quebec on this continent), but the waters of Lake Constance temper its climate, allowing a great variety of tropical and subtropical as well as temperate zone plants to flourish there.

A rose garden below the castle terrace was laid out in Italian style, with a fountain at the center of its intersecting paths and a wisteria-covered arbor across one end. The beds were bordered with roses trained as standards, alternating with standard lantanas, marguerites, plumbago, bougainvillea, fuchsias and dusty millers. There were 200 species and cultivars of fuchsia

at Mainau, some more than 130 years old.

In addition to this formal rose layout, a long stretch of the path that skirted the southern side of the island led through an extensive planting of rambling roses, tree roses and large bush roses. In all, there were more than 1,000 different types of roses growing on the island, some more than 500 years old.

A path down the sloping bluff leading to the harbor wound first through a lush planting of over 180 varieties of rhododendrons and azaleas, then down to the most tropical part of the garden. Here were several species of palms and bananas and jumbo specimens of the "tree tomato" (*Cyphomandra betacea*), yuccas, African hemp (*Sparmannia africana*), Norfolk Island pine (*Araucaria heterophylla*) and the Brazilian coral tree (*Erythrina crista-galli*). The understory was a jungle of plants, resembling an overstocked indoor plant shop: elephant ear, tree fern, cut-leaf philodendron, clivia, artillery plant (*Pilea microphylla*), New Guinea impatiens, hibiscus, spider plant, pomegranate, cannas, bamboo, bougainvillea and maidenhair fern.

During our visit we were fortunate to be there not only when the summer color was still at its height, but also when the fall display of dahlias was at its best, and an incredible display it was: 20,000 plants comprising about 200 cultivars, all in bloom.

In view of this resplendence, it was not surprising to learn that Count Bernadotte had also provided for a profusion of winter blooms. He had gathered orchids from all over the world and housed them in greenhouses inhabited by colorful, screeching parrots.

The next morning we visited the hill town of Regensburg, founded in 1200 and now part of Zurich. Our destination was the gallery of the artist Lotte Gunthart, famed for her water colors of roses. Mrs. Gunthart has exhibited widely in Europe, and in 1970 she was invited to exhibit at the Hunt Botanical Library at Carnegie-Mellon University in Pittsburgh. One of her line drawings appears on the rose pamphlet of the Brooklyn Botanic Garden. Fine reproductions of her paintings were sold in her gallery, which occupies an ancient, house on the Regensburg village square.

PRECEDING PAGES: Isola Bella, one of a group of three islands in Lake Maggiore, contains gardens designed in the 17th century. RIGHT: Red geraniums, a popular window box subject, decorate a Swiss street.

Dorothy Knecht, who enjoys horticultural travel, lives in San Francisco and operates a retail plant business that specializes in unusual citrus.



Dorothy Knecht



Paul F. Freese

The original Unterbruglingen manor, framed by lawns and large old trees, served as a tea house during the horticultural show, "Green '80."

We went on from Regensburg to the recently relocated Botanical Garden of the University of Zurich. Although much of the planting was still immature, we enjoyed browsing in the rock garden, which included a collection of Japanese plants. Most striking was a bed planted with a South African perennial called lion's ear (*Leonotis leonurus*), which was unfamiliar to all of us. This plant grew three to four feet tall and bore spikes of showy orange flowers in false whorls along its stem. It is cultivated much as the geranium is, by either lifting the plants or taking cuttings for overwintering.

The cities and villages of Switzerland were bright with flowers on our visit. Flower beds decorated traffic islands and public parks, and window boxes embellished every house and commercial establishment. Familiar summer bloomers were often combined with the much favored geraniums: ageratum, petunias, marigolds, dusty millers, fuchsias and begonias. We learned that the boxes were removed each year for the winter and stored in cellars until spring.

We were also impressed with how much land was given over to community gardens. These gardens were so highly valued that there was always a long waiting list

of people hoping for an allotment. Not only were the gardens important for food and flowers, but they were also used as a form of recreation. The lessee was allowed to build a small house for tools and picnicking, but not for overnight use.

When we left Zurich, we headed for Lugano, on Lake Lugano, going via the San Bernardino Pass. The countryside we travelled through was continually pleasing to the eye. The land was intensively cultivated, and in this respect it reminded us of Japan. Fields were dotted with pink-flowered *Colchicum*, and Queen Anne's lace grew from rocky outcroppings. Sunflowers seemed to win the popularity contest in the small village gardens, and we saw apple trees, carefully espaliered over the years, that reached the tops of second-story windows.

The day was so bright and sunny that it was something of a surprise to be reminded that the autumn harvest was almost at hand. The grapes ripening in the vineyards were protected with netting against the devastation of the birds; the tobacco was drying on racks (we didn't know they grew tobacco there); and the fodder corn was browning in the fields.

After we crossed the San Bernardino Pass,

the look of the countryside changed. We were now in a semitropical climate. Here were loquat, palm, oleander, banana, bamboo, crape myrtle, cypress and magnolia.

We had time before reaching Lugano to visit a former palazzo on an island in Lake Maggiore, off Brissago. It is now a public park. Because it is an island, its climate is particularly mild, and many tropical and semitropical plants flourish there. The gardens were designed in the romantic style, with no lawns, and gravel paths wound through woods of palm, bamboo, eucalyptus, sweet gum, magnolia and loquat. Previous owners clearly liked to collect the exotic, and the profusion of shrubs included the Mexican orange (*Choisya ternata*), castor bean (*Ricinus communis*), bunya-bunya (*Araucaria bidwillii*), Scotch heather (*Calluna vulgaris*), mimosa (*Acacia dealbata*), the Buddhist sacred lotus (*Nelumbo nucifera*), a huge clump of *Rodgersia aesculifolia*, gardenias, camellias, *Skimmia japonica*, citrus, a tremendous variety of Malvaceae, Lawson cypress (*Chamaecyparis lawsoniana*) from our Pacific northwest, loquat and banana. At the southern end of the island a sizeable silk tree (*Albizia julibrissin*) grew in the



The floral displays on the island of Mainau were dazzling—not surprising since over 350,000 annuals were planted out each year.

center of a very large, round bed of brilliant red polyanthus roses.

The next morning we visited a private, contemporary garden designed and planted within the last 10 years by an Englishman, Sir Peter Smithers, from Winchester, England. Sir Peter's garden, located on a steep hillside above Lake Maggiore at Pico Marcote, spanned a fern-filled canyon formed by a year-round stream flowing from a spring on the upper part of the property.

The house and gardens were designed so they could be cared for with a minimum of maintenance. The plants were chosen so that no replanting need be done, nor any lifting for winter. Some weeds still sprout every year, but as the garden matures, there is less and less labor required for its maintenance.

The climate at Lake Maggiore is mild. The annual rainfall totals about 75 inches, and the winter temperature occasionally gets down to 2° C, but only for a brief time. The climate is particularly ideal for tree peonies (*Paeonia lutea*), of which Sir Peter had about 150 types, the largest collection in Europe.

A rock garden climbing the hill at the end of a private patio was planted with cascading cotoneaster, alpine rhododen-

drons, 15 to 16 different rosemarys and 200 sempervivums. From there, a path wound down to a lower area that was designed as a Japanese strolling garden. Each turn in the path led into a different plant association, of which there were 16 in all. The variety of plant material was astonishing.

The gardens were designed in the romantic style with no lawns, and gravel paths wound through woods of palm, bamboo, eucalyptus, sweet gum, magnolia and loquat.

Sir Peter has been a keen horticulturist all his life. When he was 15, he began a ledger of plant acquisitions in which he has recorded all the plants he has acquired since then. The latest entry we saw was on page 794, #26,266, for *Hibiscus veronica*. As we wandered along, we were inclined to believe he had kept all those 26,266 plants and set them out in his

strolling garden! Most of this lower area is expected to become self-sustaining.

Wide upper terraces were planted with his collection of 130 magnolias. Rhododendrons and camellias grew as an undercanopy. These terraces were designed so that the blooms could be enjoyed from the house above.

The next day we went to see Villa Taranto in Pallanza, also on the edge of Lake Maggiore. A Scot, Captain Neil McEacharn, now deceased, purchased the property in 1931 and developed a botanical garden there during the next 30 years.

Both sides of the entrance drive were bordered by a deep plantation of conifers collected by Captain McEacharn in his travels around the world. The trees had attained considerable size and were spaced far enough apart for each one to achieve its natural symmetry and be seen in all its beauty.

Near here was the greenhouse where the giant water lily, *Victoria amazonica*, was cultivated. Seeds were germinated every February, and from April to October the spectacular lily occupied the entire house.

A visit to another outstanding garden took us out into Lake Maggiore, to Isola
Continued on page 38

Evergreen Maples

TEXT AND PHOTOGRAPHY BY J. D. VERTREES



TOP LEFT: The blossoms of *Acer syriacum*, a species rarely seen in the United States, appear in April or May.

ABOVE: The new spring foliage of *Acer creticum*.

TOP RIGHT: The mature foliage of *Acer paxii*.

J. D. Vertrees is the author of *Japanese Maples* and is the proprietor of Maplewood Nursery in Roseburg, Oregon.

That there are evergreen maples is a completely new thought to most horticulturists. Indeed, few professional horticulturists and landscapers are familiar with this group of plants, and knowledgeable plantsmen are quite surprised when they see these maples for the first time. Unfortunately, they are little known in the United States and not widely found in ornamental plantings.

The term evergreen maples should be explained. These plants do not have the true evergreen foliage of conifers or the evergreen broad-leaved plants such as most rhododendrons, hollies or camellias, whose foliage remains for two or more seasons. In the case of the evergreen *Acer* species, it is more correct to describe their foliage as persistent. In native stands of these species the leaves persist in a green form for more than two growing seasons, and in cultivation, if given the proper climatic conditions, the leaves may remain on the plant for more than one growing season. When used as landscape plants in frost-free localities, most of the foliage will persist over the winter, but in less favorable climates the plants will drop their leaves following periods of freezing temperatures.

The leaves of maples also vary in shape, texture and size far more than many people



realize, and the evergreen maples described in this article are among those which exhibit these variations. We are probably most familiar with the leaf on the syrup can or the Canadian flag. Easterners think of the sugar maple leaf (*Acer saccharum*). Westerners know the big leaf maple (*A. macrophyllum*), and we all recognize the leaf variations of the Japanese maple (*A. palmatum*). But many other interesting leaf forms occur in maple species found around the world. Some bear foliage that looks like peach leaves and some have pear-like foliage. Other species have holly-like leaves or tough, leathery, toothed foliage. In addition, some taxa are small bushes rather than trees.

The maples grouped in the evergreen category are native to sites in the Himalayas and certain southern regions of China and Korea as well as the Mediterranean area, particularly Syria, Turkey and Greece. Some of these plants will withstand temperatures near 0° F; others will survive well below freezing but will drop their older foliage. Although well suited as landscape plants in milder regions of the United States, these species require winter protection in colder areas, since most will be killed by temperatures approaching 0° F.

Fortunately for avid horticulturists in colder regions, all of these species adapt

well to container growing. When grown in ornamental planters they can be moved to a protected location during the coldest periods of the year. With judicious pruning, training and minimal fertilization, these plants can be kept as relatively small container specimens. They should be grown in a porous soil mixture and watered sparingly to avoid developing soggy root areas. These trees have an unusual beauty and make excellent conversation pieces. Some species, such as *Acer orientale*, have become quite popular with bonsai enthusiasts as they have small leaves, dense, twiggy growth and exhibit excellent response to pruning.

The following descriptions of some evergreen *Acer* species are provided to guide the gardener in the selection and cultivation of these splendid plants.

Acer laevigatum Wallich. Eventually this species may reach a height of 30 to 40 feet in an upright tree form. Its spectacular leaves are oblong-lanceolate, range from three to nine inches long, one to three inches wide and have long, tapering tips. The leaf edges are normally smooth or only very slightly serrated. Each leaf has an olive-green upper surface that is quite smooth and shiny. The underside is heavily veined. Young developing shoots and leaves have a beautiful red tone that gradually turns

green as they mature. During mild winters the leaves will remain on the tree and, in fact, hold on through the following summer, but with heavy frosts they will drop. Older branches have attractive olive-green to purplish bark that is quite bright in winter. I know of older plants that were severely damaged by temperatures of 16° F in California several winters ago. Fortunately, new growth arose from the base of the plants to form beautiful multi-trunked specimens. *Acer laevigatum* is originally from an area ranging from southeast Asia to the Himalayas.

Acer fabri Hance (formerly called *Acer fargesii*.) This small 30-foot tree, a native of China, was brought into cultivation in Europe about 1902. It is a close relative to *A. laevigatum* and probably no more hardy. The oblong to lanceolate leaves taper to a very sharp point and range from three to five inches in length and are one to two inches wide. The new shoots are an attractive pinkish to red color at first, later changing to yellow-green.

Acer oblongum Wallich. In time, this plant will form a tall shrub or small tree. Its oblong to ovate leaves are rather hard and leathery in texture, vary from two to four inches long and are about half as wide. A dark-green color, they are quite

Continued on page 40



Lord & Burnham

SOLAR GREENHOUSES

An expert in the field offers an annotated checklist of things to know before you buy.

BY BILL YANDA

There's a revolution in home greenhouses going on. Suddenly, many advertisements for residential greenhouse kits feature "solar," "energy conserving" or "passive collector" in bold type, but this promotional barrage can be confusing to consumers. The old adage, *caveat emptor*, is just as applicable today as it was 2,000 years ago.

First of all, it's true that all greenhouses are solar, but some are far more solar powered than others. Think of the greenhouse itself as the solar collector. Without any extra solar panels, a correctly designed and placed greenhouse will add heat to a house throughout the winter and be an important energy saver throughout the year. Improperly installed and placed, a greenhouse could actually be an energy consumer.

A good solar greenhouse should have three objectives: it should collect and distribute the optimum amount of solar energy for itself and/or an adjoining structure; it should be able to store surplus energy for use during the night or when days are cloudy; and it should be designed to reduce the heat loss during and following collection periods. By keeping these objectives in mind, and increasing your technical knowledge of greenhouse construction by reading this article, you should have no trouble evaluating promotional materials and product specifications of the various manufacturers of solar greenhouses. The annotated checklist of suppliers and additional reference material at the end of this article will also help.

GLAZING TREATMENT

The clear areas of a greenhouse (usually made of glass or plastic) are the most im-

portant solar component in the system. This glazing is both the hero (for heat collection) and the villain (for heat loss) in the story. Begin your examination of a solar greenhouse kit by concentrating on the following details:

- **Tilt and Orientation of the Glazed Areas.** A well designed solar greenhouse should have steeply tilted, south-facing walls. If the majority of the south glazing is tilted (between 50° and vertical (90°)), the greenhouse will collect more solar energy in the winter and reflect unwanted heat from the sun in the summer.

Several of the new products on the market have a distinctive solar shape, and the angle of their south wall will be about 60° from the horizontal. For the best solar performance, avoid greenhouse designs that have low-angled, fully-glazed roof surfaces. These reflect a good deal of much needed winter sunlight, and in the summer, the low roof transmits almost 50 percent more heat energy into the greenhouse—and your home—than a steeply tilted surface. Good solar heating and cooling design always begins with the proper angling of the south-facing wall.

- **Endwall Treatment.** Look carefully at the design of the east and west endwalls. Thermally speaking, east and west facing glass or plastic walls are a disaster. Consider these statistics: a vertical, double-glazed square foot of glass at 40° north latitude (Philadelphia, for example), facing due east or west, transmits 1083 B.T.U.'s in June and a measly 393 B.T.U.'s in December. (A British Thermal Unit is the amount of energy needed to raise the temperature of one pound of water one degree Fahrenheit.) Compare these figures to those for a south vertical wall: here, a square-foot of glass transmits only 527 B.T.U.'s in June and 1435 B.T.U.'s in December. One begins to get an idea of how much of a problem east and west facing glazing

is in all structures. In the solar greenhouse, however, the solution is not as simple as eliminating all east and west glass. You must consider the end use of the structure. What kind of plants do you intend to grow? For long day plants (coleus, begonia), all glazed end walls may be appropriate, as long as your greenhouse is under 16 feet long. For most solar greenhouse users, however, all-glass end walls are a thermal extravagance and unnecessary for a successful and productive growing environment for most common vegetables and flowers. Once the greenhouse exceeds 16 or 18 feet in east-west length, the endwalls provide very little side lighting and should be at least partially opaque and insulated.

- **Seals around the Panes of Glass or Plastic.** A great deal of energy is lost in greenhouses around the perimeter of each glazed panel. Before choosing a greenhouse kit, examine two things: how the manufacturer seals the glazed panels and how many panels there are. Look for gaskets of neoprene or black, flexible material called E.P.D.M. (ethylene propylene diene monomer). Avoid foam rubber seals (they break down), aluminum bridges without a gasket (they don't slow heat flow) or "wet" seals (calks) that will shrink apart and demand extraordinary care for good installation. Buy a kit with as few separate panes of glazing material as possible. The more pane edges that need to be sealed, the greater the possibility of heat loss.

- **Number of Glazing Layers.** Heat loss within a greenhouse is substantially reduced every time another glazing layer is added. A double glass panel reduces heat

Solar greenhouse additions can be decorative as well as functional. In this solar room, plants and furniture provide a pleasant ambience. Black cylinders filled with water provide valuable heat storage during cold months of the year.

Bill Yanda is the co-author of *Food and Heat Producing Solar Greenhouse* and is active in the International Solar Energy Society.



Lord & Burnham

The dug foundation of this greenhouse (pictured from the inside on page 30) provides extra insulation from both heat and cold.

loss by about 50 percent. This heat savings becomes much greater with the addition of a third layer of glazing. Unfortunately, adding layers of glass and air spaces becomes an exercise in diminishing returns, because every time another layer is added, the amount of light coming through to plants is reduced. (Some light is reflected off the glazing material and back outside.) If a single layer of glazing material transmits 85 percent of the light into the greenhouse, then two panes of the material will transmit only 72 percent ($.85 \times .85$) and three panes only 61 percent ($.85 \times .85 \times .85$). Still, except for some extremely southerly locations such as Miami or Brownsville, Texas, double glazing is always justified and should be mandatory in a solar greenhouse kit.

The use of low-iron glass makes triple glazing increasingly attractive in cold climates where snow cover is constant. The high transmittance of low-iron glass (iron is an impurity that blocks solar transmission through glass) and acrylics, makes it possible to get as much as 78 percent of the available sunlight through a triple layered panel and save on heat losses at the same time. Right now, because of the small market for these products, low-iron glass

and acrylic panels are very expensive. Insist on double glazing and investigate triple glazing options for the future.

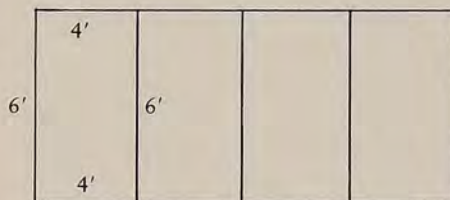
- Choice of Glazing Materials. The last major area of glazing you should keep in mind is the material used. Here, aesthetics

are just as important as longevity and light transmittance. In general, glass, acrylics, polycarbonates, fiber reinforced polyesters and polyethylene are the most common greenhouse glazings.

Glass is hard to beat for its light trans-

The Number of Panes of Glazing Material Affects Heat Loss.

LARGE PANELS



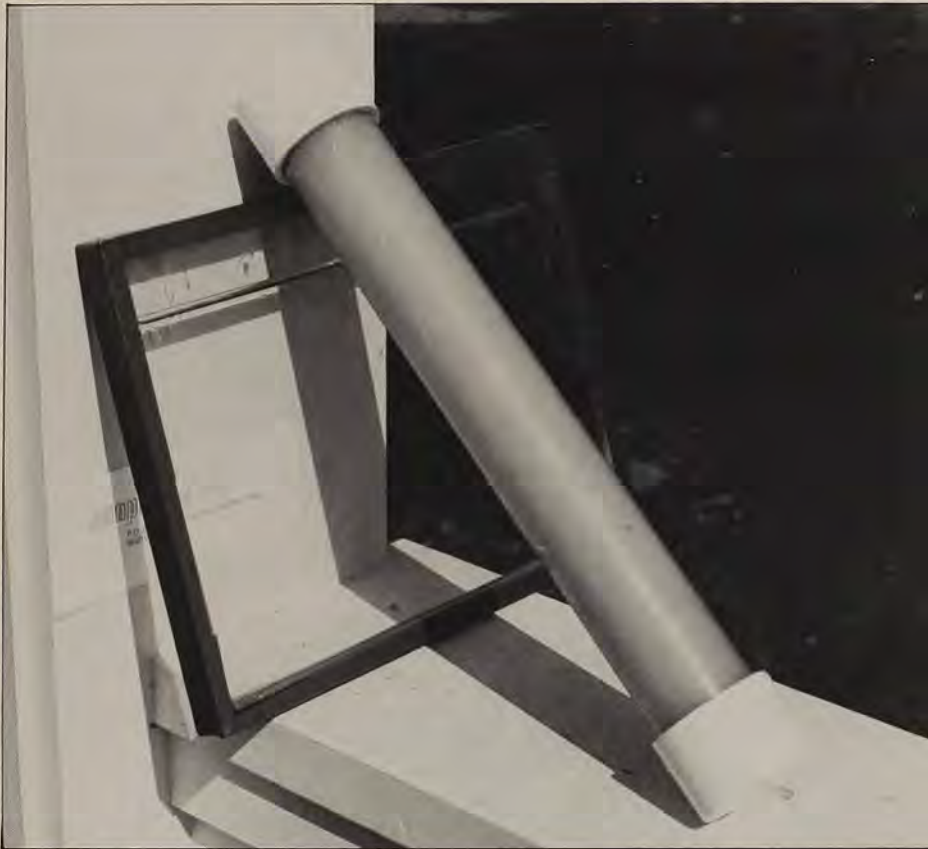
PERIMETER CLOSURE—80 FEET

SMALL PANELS



PERIMETER CLOSURE—192 FEET

The first glazed area has four panels six feet high and four feet wide. The second glazing area, although covering the same number of square feet, contains six times the number of panels and over twice the perimeter closure. (Each side of a panel must be counted because it adjoins a supporting member.) Larger panels provide another benefit as well. Fewer structural supports are needed, so more sunlight gets in to the plants.



Sunplace

Clear Heat™ by Sunplace demonstrates two ways of containing transparent phase change material. Glass is the liquid state; the pipe shows the solid stage of the product.

mission, serviceable lifetime and appearance. Some of the newly improved plastics, notably the cellular acrylic products, have some advantages over glass. They transmit more light, are shatterproof and can be formed into curves at a reasonable price. But investigate the longevity of plastics. Acrylic will maintain its high transmittance for decades, but the outer surface of polycarbonates will soon whiten and age. This won't affect the serviceable lifetime of the glazing, but it can reduce the amount of light transmitted by as much as 20 percent. An excellent article, published by the New England Solar Energy Association, compares solar glazing products and is included on the reference list at the end of this article.

SOLAR COMPONENTS

Having a well-designed and properly placed greenhouse on the south side of the house is fine, but overall heating and plant growing can be greatly improved if you supplement your system with a full line of solar components designed to enhance the greenhouse's maximum performance. Some of the more important thermal options you should look for are:

- **Moveable Insulation.** The best way

to stop major heat loss in a solar greenhouse is to cover the glazed areas at night with a moveable insulating barrier. In extreme northern climates this is a must. One of the most effective barriers is IR (Infra Red) reflective curtains. The IR barrier is usually a foil-like material laminated to a thin cloth with the shiny side facing the interior space. The system has a negligible R-value in itself, but it serves to reflect heat radiation back to the plants, creating another air space and slowing down night air movement (convection) in the greenhouse. Besides reducing heat loss by 50 to 60 percent, the insulation markedly boosts the performance of the greenhouse as a collector. For instance, a 20-foot solar greenhouse in Boston would provide about 14 percent of the heat for a 1,500 square-foot home. The addition of the IR barrier would up that fraction to 19 percent (or a 35 percent boost). There are other systems coming on the market, but be sure to inquire about their availability, cost and operation before you buy.

- **Fan/Controller Systems.** As any greenhouse gardener knows, the proper movement of air is critical to a successful growing environment. The same can be said to apply to the heat performance of

a greenhouse. There are optimum amounts of air movement from greenhouse to house and specific times when air movement should or should not occur. Passive air flow (without fans or pumps) can be accomplished by properly sizing and locating doors, windows or vents between house and greenhouse. However, many people will enjoy the convenient benefits of a fan system that contains a differential and proportional thermostat that provides just the right amount of airflow and heat transfer at the right time. These small, micro-processor controlled units are offered by several manufacturers. For greenhouse exhaust to the outdoors, check that any ridge-mounted vents or fans have tight air and water seals; leakage of both heat and water is a common problem with roof ventilation systems.

- **Heat Storage Products.** The ability of a solar greenhouse to store heat during the night and on cloudy days is a critical factor in its overall performance. Surplus heat from the greenhouse can be stored two ways: passively and directly, or actively, by moving the heat to an isolated area such as a rock bed below the floor of the greenhouse. In almost all cases, the passive manner is more appropriate in residential greenhouses.

The choices in passive storage materials are practically infinite, but the most commonly used materials are brick, concrete block, stone and tile. Dense materials such as these actually absorb heat from the sun's rays, releasing it once the heat source has gone. These hefty products are not likely to be packaged and shipped UPS to your door, but their proper installation and sizing should be part of the manual that comes with your solar greenhouse.

Water is an even better passive medium for heat storage. Containers to hold it more efficiently have come on the market recently. These come usually in the form of large cylinders or tanks and can be ordered from a greenhouse supplier who should be able to tell you exactly how many you need to maintain a specific temperature regime in your greenhouse.

The problem with these water tanks is that they take up a good deal of room most greenhouse owners would prefer to use to grow plants. New products containing eutectic, or phase change, materials are being offered that take up much less room and store 10 to 20 times the amount of heat energy as an equal volume of water. The heat energy is released when the chemicals in these containers change from one chem-



Garden Way

Plants flourish during the winter in a greenhouse designed for maximum solar contribution.

ical state to another—from liquid to solid and back again as the temperature within the greenhouse changes.

To make an intelligent purchase of these eutectic materials, you must know several things about the product. What is its phase change temperature? Optimum ranges for greenhouse phase change materials are between 60° and 80°F. Obviously, if the chemical in your phase change product alters only around 100°F, temperatures in your greenhouse will have to reach that level before the materials can do their job. Such high temperatures aren't very pleasant for plants or people. You will also need to know how much storage efficiency is lost over time in the phase change product. Some salt compounds, for example, quickly lose their ability to release significant

amounts of heat energy after several phase changes have occurred. The ideal product is one that is relatively unaffected by these changes. You also need to know the life expectancy of the product. Even the most efficient eutectic products will begin deteriorating over time. The material may have to change chemical states as many as 200 times a year. If the product is capable of maintaining a high level of energy release after 1,000 phase changes, you can assume the product has a life expectancy of at least five years.

Finally, you need to investigate how the material is contained and whether or not it will leak. Poor encapsulation has been a problem with many products on the market. Be sure to ask for documented test results. Most phase change materials are

eutectic salts, highly corrosive, with a tendency to leak. A new area of promise in phase change materials, however, is organic polymers that have very long lifetimes. They are noncorrosive and have phase change points in the 65°-70°F range, just right for the solar greenhouse.

TECHNICAL SUPPORT

A solar greenhouse is a complex biotechnic unit. When correctly designed and installed, it performs a multitude of functions well. For this reason you should look for companies which offer services that can aid in getting the maximum benefits from the unit. These services could include:

- **Computer Simulation.** Thanks to a few dedicated scientists, passive solar heating effects can be reasonably estimated for

A Selected List of Greenhouse Manufacturers Making Solar or Energy Conserving Kits:

Metal Frame Greenhouses

- Garden Way Solar Greenhouse, 122 Ferry Road, Charlotte, VT 05445.
- Lord and Burnham, Solarium, 2 Main Street, Irvington, NY 10533.
- Instant Greenhouse, 333 E. Airy Street, Norristown, PA 19401.
- Thermodular Designs, 5095 Paris Street, Denver, CO 80239.
- Four Seasons, 910 Rt. 110, Farmingdale, NY 11735.
- Vegetable Factory, 100 Court Street, Copiaque, NY 11726.

- Solar Resources, P.O. Box 184, Taos, NM 87571.

Wood Frame Greenhouses

- Abundant Energy, Radiant Room, 225 Newport Bridge, Warwick, NY 10990.
- Brady and Sun, LivingRoom, 97 Webster Street, Worcester, MA 01603.
- Habitat Solar Room, 123 Elm Street, South Deerfield, MA 01373.
- Pella, Sunroom, Rolscreen Co., Pella, IA 50219.

any set of conditions. Companies that advertise greenhouses for solar gain should be able to provide you with an estimate of what that will mean in dollars saved on your home heating bill. Using sophisticated programs, the company can ask you the right questions and produce an estimate. Some of those questions might be home location and size, greenhouse size desired, winter shading effects, orientation of the house, heat load of the house and thermal options mentioned earlier. Some companies will even optimize performance by mixing and matching a multitude of options to your budget and site. This is a reasonable service to expect if you're buying an expensive solar addition.

● A Detailed Installation and Operation Manual. A manufacturer or distributor should provide you with a manual that goes beyond a simple set of assembly instructions. As the ultimate performance of the solar greenhouse is dependent on its siting, weather-tight erection and correct operation, you need to have a thorough understanding of solar principles and some familiarity with thermodynamics.

In addition, the growing environment in a solar greenhouse is different from either a conventional climate-controlled greenhouse or an outdoor garden. Some manufacturers will provide an operations and growing manual that deals specifically with the temperature and light regimes of their product. Others should be able to refer you to popular and technical publications on the general topic of growing plants in a solar greenhouse environment.

● Specialty Products. Solar greenhouses are excellent spaces for other solar and special growing products. For instance, many people are installing solar water

heaters inside the greenhouse. It's a natural combination when correctly applied. Ask the greenhouse company if they sell or specify solar water heaters, heat pumps or new growing accessories that are a good fit or option to their greenhouse product. This service can save you a lot of shopping around.

What should be the cost of the addition? The solar greenhouse will be one of the most versatile and valuable rooms in the home. In quality and aesthetic appeal, it should be the equal of the home. Expect to pay an installed cost for a high quality kit greenhouse that is equal to, or slightly above the market value (per square foot) of your house. Because energy costs are escalating faster than housing costs, the solar greenhouse will become increasingly valuable in relationship to the house, if this rule is applied.

SOLAR TAX CREDITS

The IRS, in its infinite wisdom, has created a fog of confusion around the solar greenhouse issue. Technically and specifically, the regulation prohibits the taxpayer from the 40 percent federal tax credit when using a *greenhouse* as a passive solar collector. The idea here is that any system so efficient as to perform more than one function (heat collection, food or flower growing, additional space, winter humidifier, air purifier) should certainly be penalized and excluded from tax incentives that single function systems enjoy. (Anyone who's ever read federal tax form instructions can see how, logically, the IRS came to that conclusion.) The confusion occurs because several home greenhouse manufacturers have blatantly advertised that their products "may qualify for the federal tax credit."

This is technically true, but it can be misleading to the homeowner. If you call a greenhouse a large-volume air collector (or some such euphemistic term), if it only serves *one* function (solar collection), if you don't read the Federal Register or consult the IRS (and throw this article away), and if you are prepared to totally rid the unit of flowers, vegetables, furniture, hoses and sandboxes in the event an IRS auditor wants to pay a visit. . . . then, true, your greenhouse *may* qualify for the federal tax credit.

Many states are *very accepting* of solar greenhouses and sun spaces and encourage their purchase through a variety of direct and unambiguous incentives. New York, California, Massachusetts, Vermont, Colorado and New Mexico are among the most generous, allowing up to 50 percent of the total cost of the addition as a state tax credit or rebate. The solar greenhouse supplier should be able to provide you with accurate and helpful information on exactly what incentives, if any, are available in your area.

The site-built solar greenhouse field has grown enormously because designers, homeowners and custom builders see the real and multiple benefits the application supplies. The manufactured solar greenhouse industry will grow even faster, and with a little conscientious prodding from educated homeowners, it will bloom to the fullness of its potential. ☉

For additional reading:

The Food and Heat Producing Solar Greenhouse, Bill Yanda and Rick Fisher; John Muir Publishers. P.O. Box 613, Santa Fe, NM 87501. Revised 1981. \$10.00 pp.

The Complete Greenhouse Book, Peter Clegg and Derry Watkins, Garden Way Publishing, Charlotte, VT 05445. 1978. \$11.95 pp.

The Passive Solar Energy Book, Ed Mazria, Rodale Press, Emmaus, PA 18049. 1979. \$14.95 pp.

Technical publications:

Proceedings of passive solar conferences with technical papers on solar greenhouses can be purchased from the American Section of the International Solar Energy Society, US Highway, 190 West, Killeen, TX 76541. Enclose \$1.00 for the list.

An excellent article on solar glazing materials is in the Newsletter of the New England Solar Energy Association, Feb. '81. P.O. Box 541, Brattleboro, VT 05301. \$2.00.

Continued from page 20

monadelpha. It is the tallest of the genus, reaching a height of 75 to 80 feet, but unfortunately it has the smallest leaves and flowers. I have seen plants with thousands of flowers that were so small they made no show. Some specimens can have attractive blossoms that reach a diameter of one inch or slightly larger. This species generally flowers during the month of June. *Stewartia monadelpha* has exceptionally beautiful red bark that exfoliates in thin flakes. Its fall color is purplish.

A very similar plant native to China, *S. sinensis*, is very difficult to distinguish from *S. monadelpha*. Both have rather large, greenish floral bracts at the base of the flowers. In *S. sinensis* these bracts are somewhat smaller than the calyx of the flowers, while in *S. monadelpha* the bracts are somewhat larger. The seeds and flowers are also larger in *S. sinensis*. Some experts say that the flowers of *S. sinensis* are pinker than other species, but in the few flowering plants I have seen this has not

been true. Other than these few distinguishing features, the species look very much alike.

There is a supposed hybrid of *S. pseudocamellia* and *S. monadelpha* known as *S. X henryae*. I have a specimen of this in my garden, and it is very ornamental. Its flowers are larger than *S. monadelpha*, and although smaller than those of *S. pseudocamellia*, are borne in greater numbers. The floral bracts are large, like those of *S. monadelpha*, but otherwise the leaves and growth habit appear to be more similar to *S. pseudocamellia*. The fall color is purplish-red, almost the color of a burgundy wine, and the bark is orange and smooth. My tree appears to have "hybrid vigor" as it has outgrown both parent species growing nearby. I have noticed that this tree is quite susceptible to bark-split near the ground if any late frosts occur after growth starts. This is especially true on the east side of the tree because it is rapidly thawed by early morning sun. My

plant has been injured by this bark-splitting several times but has always healed with no apparent detriment. In fact, it usually will flower more heavily in years the bark-split occurs. I have not noticed this problem in any other species.

Other *Stewartia* species include *S. rostrata* and *S. serrata*, both very uncommon in gardens. I have never seen *S. rostrata*, but it is growing at the Arnold Arboretum. *Stewartia serrata* is quite similar to *S. monadelpha*.

Franklinia alatamaha has long been known as the "lost camellia." Originally native to Georgia along the Altamaha River, this species has not been seen in the wild for over 175 years. Fortunately, early plant collectors saved it from apparent extinction.

Franklinia has been widely planted in gardens. There are many old specimens in Maryland, Pennsylvania and Delaware. Ironically, it apparently does better in the mid-Atlantic states than in its native Georgia. My experience with this species is that it is very particular about where it grows. It seems to do exceptionally well in my alluvial soils, and several of my plants grown from seed have reached 15 feet in only eight years. The white flowers, each with a center cluster of yellow stamens, are produced from early August to frost. The rounded capsules from the previous year's flowers ripen while the flowers are present. Most flowers are slightly cupped and range from two to three inches in diameter. One tree that I raised from seed bears flatter blooms that exceed four inches. All of my plants are mulched annually and watered frequently during dry spells. *Franklinia* trees will drop their leaves very rapidly if they become dry. Abundant organic matter is also essential, and the soil reaction must be slightly to moderately acid (pH 5.5 to 6.5). If soils are more acid than pH 5.5, the plants will respond to applications of high magnesium limestone (dolomite). When speaking of two very large specimens at the USDA Plant Introduction Station, Glenn Dale, Maryland, Dr. William L. Ackerman told me that these plants have been broken many times under loads of ice and snow. Apparently the wood becomes very brittle as it ages, and gardeners should note that it would be better to allow several trunks to develop rather than just one so that there will be replacements for broken stems. Many catalogues and periodicals make reference to the red fall coloration of *Franklinia*. My trees grow

How to Propagate These Plants

Stewartia seeds exhibit relatively complex dormancy requirements, and gardeners wishing to propagate plants by this method will find the process is relatively slow. Since *Stewartia* seed is not viable for very long after ripening, fresh seed is essential. I stratify fresh seed in moist (not wet) peat that has been placed in small containers with about one inch of peat below and one-half inch above the seed as covering. I then place each container in a plastic bag, tie it and put it in a dark location, where it should remain at room temperature for five months. After this period, I place the containers in a refrigerator for three months at 40° F. These two treatments satisfy the dormancy requirements, and after they are completed, the seed can be placed in an area with strong, indirect light. At temperatures of 75° F or above they will germinate in 14 to 21 days.

Stewartias can also be propagated by leafy cuttings taken in mid-July through mid-August, and this is probably the easiest method for propagating plants in this genus. I treat cuttings with a rooting hormone such as Rootone or Hormodin and root them in flats that are stored at 38° to 40° F during the

first winter. In the spring, after new growth has begun, the plants may be potted individually. I have found it is best to leave the cuttings undisturbed during this first winter; if the plants are transplanted too soon after they are rooted, they will rarely begin growth the following spring.

Franklinia is best propagated from seed as cuttings are difficult to root. As with *Stewartia*, fresh seed is essential for success. Place the collected seed in a container with moist (not wet) peat and stratify it in a 40° F refrigerator for three months. After this period the seed is ready to germinate. Place the container in strong, indirect light; it will germinate in about 14 days if the temperature is 75° F.

Gordonia can be propagated by cuttings taken in July or August. Treat the cuttings with Hormodin #3 and root them under mist. I have also been successful with cuttings taken in December that have been treated with rooting compound and placed in a Wardian case in a shaded section of a warm greenhouse. I have not attempted to propagate this species from seed, but I suspect the requirements are similar to those of *Franklinia*.



Pamela Harper

Gordonia lasianthus.

very well but rarely have any color other than yellow or, at best, reddish-green. Usually the leaves remain on the trees until they freeze in late November, and by that time they appear very ragged indeed. Perhaps trees in other areas react differently.

Closely allied to *Franklinia* is the evergreen *Gordonia lasianthus*, commonly called loblolly bay or black laurel. A native of the Southern Coastal Plains and Gulf Coasts, this species is rather tender (Arnold Arboretum Zone 8) and only marginally hardy in the Washington, D.C. area (Arnold Arboretum Zone 7). The only plants I have seen other than my own are two rather suppressed specimens at the Aquatic Gardens in Washington, D.C.

The flowers of *G. lasianthus* bear a resemblance to *Franklinia* but are borne on long stems, or pedicels. The attractive blooms are borne throughout the summer and have a pleasant, spicy fragrance. This species requires somewhat more water than either *Stewartia* or *Franklinia*. The biggest problem I have had with growing this species is that in my rich soils, growth continues very late in the fall and, subsequently, the new, tender growth is frosted. In an effort to prevent this problem by restricting late summer growth I do not fertilize or mulch my plants. Plants of this species have withstood temperatures of 0° F with little damage when protected from winter wind. *Gordonia* has a reddish winter color.

All of the species mentioned here are

growing quite happily along a stream that runs through the lowest portion of my garden, located about 12 miles south of Annapolis, Maryland. They all require abundant organic matter in the soil and large amounts of water, and in this location they revel in the moisture and the many years accumulation of flood-deposited topsoil. Growth rates are three to four times normal. One plant of *S. pseudocamellia* grew five feet in the first year after I planted it. Although the *stewartias* are remarkably resistant to late spring frosts that can occur in this low frost pocket, both *Franklinia* and *Gordonia* sometimes have their new growth slightly damaged by cold.

All of these species seem to be able to withstand short periods of flooding (several hours) when the stream overflows its banks. However, the surface is very well drained to a depth of about 12-18 inches. Only *Gordonia* seems to be able to survive poorly drained areas. ☉

Sources

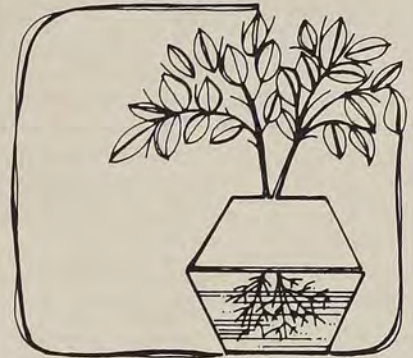
Franklinia, *Stewartia pseudocamellia*, *S. koreana*, *S. monadelphica*, *S. sinensis*, *S. serrata*:

Gossler Farms Nursery, 1200 Weaver Road, Springfield, OR 97477

S. malacodendron, *Gordonia lasianthus*:
Salter Tree Farm, Route 2, Box 1332,
Madison, FL 32340 and
Woodlanders, 1128 Colleton Avenue,
Aiken, SC 29801.

GREAT NEWS for your HOUSEPLANTS and you

Send for FREE
INFORMATION on
NUTRIPONICS™—
Use Coupon Below



Now you can grow healthy plants indoors—even tomatoes using a totally new and simple system called “Nutriponics”.

This new system uses a modern attractive planter (or even a used tin can), that acts as a water reservoir for a flower pot permitting long periods without watering if you desire. Your plants gradually absorb all the moisture they require, simply, easily, practically eliminating leading causes of house plant failure: inadequate moisture and overwatering. Fully tested. We have received many letters from customers expressing satisfaction.

NUTRIPONIC KITS AVAILABLE

Kits include our 50-page beautifully illustrated book on Nutriponics along with Liqui-Soil™, special Nutriponic pots and planting medium. Windowbox also available.

WINDOWSILL GARDENS

Grafton, N.H. 03240, Dept. AH

- Send Information
 - Send \$4.95 Kit
 - Send \$9.95 Kit
- Include \$1.50 for Shipping

Name _____

Address _____

City, State Zip _____

Checks or Money Orders Only

Continued from page 27

Bella, one of a group of three islands owned by the Birreomea family. The castle and gardens of Isola Bella were designed and constructed in the 17th century. The vaguely triangular shape of the island inspired the designers to treat it as a boat floating upon the lake, with the narrow end representing the bow and wider end the stern.

Statuary and exotic plants were used throughout the garden with baroque exuberance. As we climbed up and down the terraces, we saw soapwort, Indian sugar cane, breadfruit tree, sweet olive, coffee tree, frangipani, tapioca, pomegranate, Arizona cypress, tulip tree, Montezuma pine, yew, papyrus, Japanese maple and sweet gum. We also saw a peculiarly shaped pendulous cedar grafted onto the trunk of *Cedrus deodara*.

When they were in bloom, orchids were displayed in a grotto-like greenhouse. Its arched roof was glass, and its stone walls were lined with arched niches. At the end of the island there was a boxwood "love-knot" garden, and from there the view across the water to the mainland was dramatic.

We left Italy and headed for Lausanne via the Simplon Pass, where we prowled the sparse and rocky plain and found dandelions, gentians, heathers and wild cyclamen in bloom. The Brig Valley below the pass has a mild climate, and the farmers among us admired the orchards of pears, apricots, peaches and apples and the fields of strawberries, tomatoes, melons, asparagus and sunflowers.

At Valais, we turned off the main highway and climbed via hairpin turns up to Champex-Lac, situated at an altitude of 1,500 meters. There we went to see the alpine garden developed by an industrialist, M. Jean-Marcel Aubert. M. Aubert became interested in alpine plants after he bought the property for a summer home in 1925 and pursued this interest until his death in 1968 at the age of 94. The garden had all the saxifrages of Europe, 15 species of gentians, a large collection of conifers, carnivorous plants from the United States and five types of *Epimedium*.

We then visited the Horticultural School of Lullier on the outskirts of Geneva. The school itself is quite old as an institution, but it moved to its present location on 87 acres of flat farmland about 10 years ago. The climate is generally cold and windy, with low clouds. To provide a more favorable environment, a huge earth-moving project was undertaken to create several



Paul F. Freese

Rather than cut down a dead chestnut tree, officials of "Green '80" had it strung with bells that chimed in the wind. Larger bells, with long ropes attached, could be rung by passers by.

terraces protected by berms on the north.

There was a tremendous variety of plants of all kinds here, so that students had practical experience in their cultivation as well as a thorough training in identifying them botanically. There was an extensive collection of stone fruit trees and a fine collection of old roses, including *Rosa chinensis* 'Minima', the parent of all miniature roses, which was originally discovered growing as a sport in a Swiss windowbox.

Another day we visited the alpine garden in the Commune of Meyrin on the northern outskirts of Geneva. Forty-five hundred different species of plants were grown there, among them, many endangered native Swiss plants. We also visited a new arboretum situated between Geneva and Lausanne, the Arboretum du Vallon de l'Aubonne, where a forest characteristic of the northwestern United States was being reproduced, an undertaking that will probably require some 15 years to complete. Eventually, all the forests of the temperate zone will be represented here. In another project, the arboretum sought to preserve old varieties of fruits. Three orchards had been planted with apples, pears and plums, and

the public was invited to take cuttings to plant in their own gardens. The Arboretum employed only one full-time gardener to tend this valley of 100 hectares. He was aided by consultants who were hired as needed, and by a very active, participating membership.

The last stop on our tour was to the vast horticultural exhibition called "Green '80" (*Grun '80*), which was the impressive creation of the commercial nurserymen of Switzerland.

A flat, farmland area on the outskirts of Basel was selected for the site, and a competition was held to choose a landscape architect for the project. The exhibition was divided into several sections. There was a "Market" section with exhibitors selling all kinds of horticultural tools and supplies; an "Earth" section showing man's requirements for food and housing and how they have interacted with nature throughout history; "Recreation," a flat farmland transformed into hills, meadows and a lake, to remain as a permanent park; "Garden," with demonstration gardens designed for easy upkeep; and "Sowing and Harvest," which demonstrated the work of Swiss gardeners and nurserymen. Here we saw a vegetable garden, rose garden, tree nursery, berry garden and cut-flower garden. There was also a spice and medicinal herb garden, designed according to old monastic plans and produced by the Swiss Druggist Union. In addition, there was an exhibit of community gardens, and there were numerous special plantings, such as a bed of fragrant plants, another of plants in mythology and religion, another of plants used for dyes. The show lived up to the standard of craftsmanship we had learned to expect of the Swiss. It showed not only in their skill in producing perfect specimens of vegetables, flowers and fruits, but also in their ability to force blooms.

As we looked back on our trip, we could not recall seeing any Americans among the other tourists. England, Italy and Japan are the usual destinations for garden tours, but we were delighted that the American Horticultural Society had provided us with the opportunity to explore the less well-known but equally beautiful gardens of Switzerland. ☉

Editor's Note: The Society has scheduled its 1981 trip to Switzerland from September 24—October 8. To register, write Dorothy Sowerby in care of the Society.

COLD FRAMES CONT'D

Continued from page 14
the ground. One method is to place it on a row of bricks to help keep the wood from rotting. After disassembly, remove any soil remains with a stiff brush and allow the frame to dry thoroughly before storing it.

A warning, though—do not fall into the trap of coddling too many favorites in your cold frame or you will end up moving your entire garden under cover for winter.

Another variation is the Nearing frame, named for Guy C. Nearing, a rhododendron hybridizer. It is a propagating box for cuttings that is partially sunk into the ground and covered with glass and located so that direct rays of the sun never strike the frame to cause heat buildup. In this case ventilation is not desirable as it prevents an important function of the frame—retention of humidity to aid rooting. The best location for a Nearing frame is against the north wall of a building, if it is not shaded.

A Nearing frame is suitable for rooting a wide variety of plants including conifers, broadleaved evergreens and deciduous shrubs, with only occasional attention to watering. Many different rooting media can be used, but Mr. Nearing's favorite was a bottom layer of peat moss, a thin middle layer of half peat moss and half sand topped with two inches of builder's sand. Try taking cuttings at various times during the growing season, except very early or very late.

The cold frame has opened the door to new gardening experiences for us, and we will continue to experiment with different uses and other ways to extend the season. It has provided us with many of the benefits of a greenhouse at a fraction of the cost and no expenditure for energy except our own elbow grease. There is still time this year for you to build a cold frame and discover its benefits before winter sets in. Consider how one could work for you.

If we were to build another cold frame, would we do it differently? Yes, we certainly would. We would build it sooner, and we would build two of them. Now let's see, where shall we put that new cold frame? ☛

FULL COLOR FUCHSIA PORTRAIT



Now, available by mail, a full color portrait of the beautiful fuchsia, Swingtime, printed on heavy glossy stock. An outstanding print in vivid authentic reds, green and white against a pale blue background. A gorgeous addition to any room! Unframed portraits are \$3.95 + \$1.84 handling & shipping anywhere in U.S. or Canada. Matted prints of Swingtime in 18"x24" polished aluminum sectional frame with a non glare styrene pane, ready to hang, \$26.95 + \$6.00 handling & shipping in the U.S. Mail your check to Anne deFord/Flowers In Print, P.O. Box 293H, South Laguna, Ca. 92677. Money back guarantee.

NEW SUNROOM



and PASSIVE SOLAR GREENHOUSE

- New System 3 - "Brookhaven" model
- Factory insulated triple glazing
- G.E. Lexan® Shatterproof Panels
- 40% Tax Credit & State Credits
- Lean-To, Free Stdg. & Window units
- Curved Eave, Bronze Tone Finish

COLOR CATALOG and TAX CREDIT GUIDE: Enclose \$1. for our catalog and price list, plus our guide to the latest federal and state passive solar tax credits and qualifications. All kits shipped Freight Prepaid.

SAMPLE WINDOW KIT: Enclose \$5. for catalog and tax guide above, plus actual samples of greenhouse alum. frames, G.E. Lexan® glazing, assembly manual and heating guide.



FOUR SEASONS GREENHOUSES

910 Route 110, Dept. AH-108
Farmingdale, N.Y. 11735
Phone: (516) 694-4400

Div. Four Seasons Solar Products, Corp.
(Custom Built & Standard Sizes)

Unlocking the secrets of plants

One of America's leading botanists, the author of a popular column in *Natural History* magazine, provides a revealing look at "green wisdom"—the remarkable behavioral strategies built into plants. Through a series of vividly written vignettes, the author gives "a lucid account of how plants of all sizes manage to overcome challenges and prosper. But GREEN WISDOM does more than provide entertaining information. It gives the reader a chance to see in each example of plant life a pattern that can be applied by imagination to the improvement and enrichment of human life."—Rene Dubos

GREEN WISDOM

ARTHUR W.
GALSTON

Illustrated, \$12.95 at bookstores, or direct from the publisher. Bulk discount available to garden groups and shops, upon request.

BASIC BOOKS, INC.
10 East 53rd Street, New York, NY 10022



Inside Gardening with Everlite® GREENHOUSES



Everlite answers all your needs all year 'round with:

- Over 90 models starting at \$333.
- Precision prefabrication for fast assembly.
- Quality engineered throughout.
- Full accessories line including automatic climate controls.

Get the inside story...
Write for catalog-price list AH.
Call Toll Free (800) 321-3050
In Ohio (216) 251-6100

Aluminum Greenhouses, Inc.

14605 Lorain Avenue
Cleveland, Ohio
44111

Introducing
The **SUN TUNNEL™**
"Cloche Concept" for
Flowers & Vegetables



Used extensively throughout Europe and the Far East

- 12 ft. x 3 ft. growing area
 - Extends growing season
 - Protects from frost
 - Encourages growth of early seed plantings
 - Holds sun warmth - traps moisture - adjusts to allow proper air flow
- Rounded tunnel design resists wind.
Compact storage. Portable. Reusable.
Easy Installation.

\$34.95 postpaid

SATISFACTION GUARANTEED

Order today for prompt delivery!
Mastercard or Visa accepted

Call **914-679-7168**
or send check to:

KB Masterworks, Ltd.

677 Maverick Road - Woodstock, NY 12498

EVERGREEN MAPLES CONT'D

Continued from page 29

shiny above, but the undersurface has bluish bloom. The leaf margins are smooth. Occasionally foliage on young plants will exhibit three-lobed leaves. The foliage is quite persistent and will overwinter well into the next season. This tree will survive considerable freezing without complete loss, although terminals may be killed back.

This species is originally from the Himalayas where it is reported to reach heights of over 40 feet. Plants from this region seem to be more tender than plants propagated from the same species found in western China.

Acer albo-purpurascens Hayata. This rare species from Asia is considered by some to be a form of *A. oblongum*; others consider it a separate species. It is similar in leaf shape and appearance to *A. oblongum* but bears smaller foliage. The dark-green leaves are very persistent, and, with their oblong to ovate shape and smooth leaf margins, remind me of pear foliage. Their texture is quite firm. I have not grown this plant long enough to test its winter hardiness completely, but so far I have had plants survive temperatures of 20° F.

Acer paxii Franchet. Authorities still seem to disagree on the nomenclature for this plant. It was originally considered a variety and named *A. oblongum* var. *biauratum*, but later taxonomic studies placed *A. paxii* as a separate species.

A. paxii is one of the more durable of the evergreen types. In our collection at Roseburg, Oregon, leaves have remained on the plants through freak cold spells of 10° to 15° F. In severe winters the tips are killed back on terminal shoots. Normally the foliage persists well through the following season.

The leaves are shiny, dark green and rather leathery. Normally the leaf is three lobed, but entire forms also occur. Often both shapes are present on the same branch. The foliage is small, ranging from one to two-and-one-half inches long and about half as wide. Leaves are distinctly three-veined and on young plants may be confused with *A. buergerianum*, a species that has much thinner foliage and is truly deciduous.

A. paxii will make a large bush or small tree that is quite twiggy. Of the evergreen types, this may be one of the more cold hardy for trial in outdoor plantings. There are quite a few specimens scattered throughout the Bay Region and in Southern California.

Acer laurinum Hasskarl. The native range

of this small dioecious tree is Southeast Asia, Malasia, Indonesia and the Philippine Islands. It is rarely seen in horticulture but could be more widely used. The foliage is quite persistent. Leaves are oblong and elliptical, measuring from three to six inches long and one to three inches wide and tapering to a blunt point. The foliage is glossy green above and glaucous beneath. The branches are glaucous to purplish in tone. This species is one of the more tender of the evergreen maples and should be grown outdoors with caution.

Acer syriacum Boissier & Gaillardot. For those who wish to try an evergreen maple in colder regions, this one has the best chance of survival. Trees have survived temperatures of 0° F, although tip die-back occurred and half the foliage dropped. In years of low temperatures in the 20° F range, leaves were not damaged. This species forms a small tree with stiff, twiggy branches. On older plants, the leaves vary from ovate and entire to three-lobed. On young growth, the leaf margins are definitely toothed. The foliage texture is one of the most distinct of all maples. It is quite tough, leathery and feels very stiff. Dark-green leaves vary from one to two-and-one-half inches in both length and diameter and are totally free from down or hairs. The foliage persists well through the following growing season.

Originally native to Syria, Lebanon, Palestine and Cyprus, this species is thought to have been introduced into cultivation about 1903. The foliage is larger and more persistent than that of *A. orientale*, and most authorities consider *A. syriacum* as a distinct species. However, there are references that place it as a form of *A. orientale*. Our plants show such definitely separate characters that I prefer to retain the separate species status.

Acer obtusifolium Sibthorp & Smith. Taxonomy of this species is rather clouded and recent writing places it as a form of *A. orientale*, native to Crete. However, plants grown from seed sent to us have the characteristics of *A. syriacum* rather than the small, smoother foliage of *A. orientale*. Our plants have withstood 20° F without serious damage. The leaves are quite persistent and very leathery in texture.

Acer orientale Linnaeus. Of all the species in our collection, this maple causes the most surprise to visitors because it is so unlike one's common conception of maples.

This species ranges from a small, dense,

SPECIES FOUNDATION CONT'D

Continued from page 19

twiggy shrub up to a short, bushy tree. Its twigs are short and stubby and grow at acute angles. The small leaves range from three-quarters to one inch in length and are about half as wide. On older plants some leaves may reach the two-inch size, but not commonly. The hard, leathery leaves are mostly ovate but are occasionally three-lobed. Leaf margins vary from smooth to slightly toothed, and the tip is usually blunt. The color is rich, dark green and quite glabrous on both surfaces. New leaves exhibit a reddish tone on the edges as they unfold.

The foliage is very persistent, even with temperatures in the 10°-15° F range. Although leaves of the newest shoots will drop, the foliage from older wood will carry through the winter.

There is a considerable range in plant size and shape with seed-grown plants of this species; leaf shape will also vary. I think these variations probably account for the difference in the nomenclature used for this species. Or is it perhaps a regional variation of varietal nature? Some taxonomists assign species status to the name *A. orientale*. Others replace it entirely with *A. sempervirens* Linnaeus. A few horticultural publications also record authors who prefer *A. creticum* Linnaeus as the true species name. Whether distinct species, synonyms or varietal designations from regional differences, plants under each name from different sources in my collection all exhibit very similar characteristics.

Acer orientale is native to the eastern Mediterranean region and varies considerably in growth habit in its natural habitat. Old trees reach a height of 30 feet. In ornamental plantings a 15-foot shrub or small tree is more usual. Seed we received from native forests in Turkey have produced highly variable seedlings the first year. In the same seed beds the plants range from one inch to 14 inches tall. It will be interesting to observe the results from this much seedling variation as the trees attain some age and maturity. ☐

Sources for seedlings or young plants:

Western Hills Nursery, 16250 Coleman Valley Rd., Occidental, CA 95465
Michael A. Kristick, Stonhedge Dr. #1, Wellsville, PA 17365
Maplewood Nursery, 311 Maplewood Lane, Roseburg, OR 97470

Sources for Seeds:

Maplewood Seed Co., 6219 S.W. Dawn Street, Lake Oswego, OR 97034.

designed to illustrate probable evolution groups plants in series and sub-series classification. In addition, near the garden entrance representatives of a few outstanding and historic hybrids were planted to illustrate how the characteristics of different species recur in man-made cultivars and hybrids.

A visit to this garden is a pleasant pastime for the casual gardener as well as the more avid horticulturist. Not only can visitors learn about the different forms of *Rhododendron* that grow in the wild, but also the plantings point out possible uses for home gardens. For research botanists, the garden is a resource of carefully classified material. All visitors find the natural simplicity and balance of proportion exhibited by species rhododendrons to be impressive, especially when compared to man-made hybrids, which sometimes lack overall symmetry.

The *Rhododendron* Species Foundation actively promotes interest in *Rhododendron* culture. Surplus plant material from the garden is distributed to members on request, and it is offered for sale at tour times. In addition, the Foundation recently joined with the American Rhododendron Society to publish *Rhododendrons of China*, a translated text describing 283 species of *Rhododendron* from China. [Editor's note: For more information on this work, originally published in Chinese in 1974, see Dr. Daniels' review in the June issue of *American Horticulturist*. The book is available from the Society at a discounted price of \$15.65 plus \$1.25 postage. To order, write Dorothy Sams, American Horticultural Society, Mt. Vernon, VA 22121.]

The calendar for spring tours at the Garden is planned to coincide with peak blooming season. In 1982, the gardens will be open on specific days in April and May. The display of fall foliage colors was enjoyed by such a large number of visitors in 1980 that an autumn tour will be scheduled as an annual event. Nine months of bloom decorate the species garden; the first flowers open in January, and the last blossoms fade in September. For opening dates or special tour arrangements, call (206) 927-6960 or write the Rhododendron Species Foundation, P.O. Box 3798, Federal Way, Washington 98003. Driving distance is 24 miles from Seattle and eight miles from Tacoma with easy access, via Exit 142-A, from Interstate 5. ☐

You won't believe the difference...



A product of USDA research, AquaStor is a new soil additive that dramatically increases water holding capacity. It helps plants develop faster and grow hardier, with less frequent watering.

Protects gardens in hot, dry weather

With AquaStor, flowering plants develop more blossoms. It helps produce greater vegetable yields in less time. All with up to 50% less water.

A sure start for trees and shrubs

AquaStor helps establish plants. It virtually eliminates transplant shock and encourages root development.

Water houseplants once a month

This remarkable powder absorbs hundreds of times its weight in water, forming swollen gel particles. These actual "pieces of water" provide available moisture throughout the soil. Plants draw water **only** as needed. Smaller houseplants may require water every two weeks.

The 4 oz. package of fast absorbing AquaStor 450 is enough for ten average houseplants. For outdoors order extra absorbing AquaStor 900. One 8 oz. package does 30 ten foot rows, 200 sq. feet of garden, or 12 average trees or shrubs. AquaStor will gradually biodegrade in about two years.

We guarantee results or your money back!

Absorbent Industries Inc.
611 E. Jefferson St.
Morton, IL 61550

Name _____

Address _____

City _____ State _____ Zip _____

MC VISA # _____

Interbank# _____ Exp. Date _____

AquaStor 450	AquaStor 900
_____ 4 oz.	_____ 8 oz.
_____ \$4.95 ppd.	_____ \$7.95 ppd.
_____ Three for	_____ Three for
_____ \$12.95 ppd.	_____ \$19.95 ppd.

Credit card or money orders shipped within 48 hrs.
Check orders. allow 2-4 weeks for delivery.

Continued from page 16

vide a fascinating introduction to the history of the park and a chance to learn about the plantings from an expert.

The rhododendron-azalea gardens at Crystal Springs have grown by leaps and bounds since it was established. Although the park becomes a more impressive and beautiful place with each succeeding year, its original function as a test garden has been compromised by unplanned growth. Of the more than 2,500 plants that fill the beds, less than one third can be positively identified. Because of the numbers of species involved and their close similarity to each other, even an expert must know something of the history of an individual specimen to be certain of its identity. This is frequently impossible at Crystal Springs because, regrettably, no comprehensive records were maintained of the numerous plantings of the past 30 years. Many of the plants are one-of-a-kind hybrids whose genetic histories may never be known. The theft of identification tags and even whole bushes has further complicated the issue. But the Garden Committee, headed by Robert Furniss, has ambitious plans, which will not only enhance the beauty of the

garden, but will also re-establish it as a test and demonstration area.

One newly established bed features a display of *Rhododendron macrophyllum*—a species of rhododendron native to the Northwest, which has been collected and planted by members of the Rhododendron Society's Portland chapter. Garden Committee members are beginning to write members of other chapters around the country to obtain more plants. They hope one day to create a series of beds that will feature rhododendrons and azaleas from around the world, grouped according to the regions from which they came. Careful records are now kept of all new plantings. As this project develops it will create a balance with the wilder areas of the garden and make the park an even more fascinating place to visit.

In addition to its beautiful flowers and trees, Crystal Springs also provides a winter home for an impressive population of water fowl. The foot bridge that connects the two halves of the park is a paradise for bird watchers and nature photographers. On any winter afternoon you can see mallards, widgeon, American coot,

lesser scaup, bufflehead and most surprising, a substantial colony of wood duck, one of the most beautiful of all birds and rarely seen as easily as it is here. The ducks are undoubtedly the main attraction in the minds of the children who visit with their families, and it is a rare afternoon indeed that goes by without numerous feeding sessions. At times the surface of the lake seems to be literally covered with birds. Their antics are a constant source of delight to all, and their colorful plumage adds much to the charm of the park.

But of course, the most striking feature of Crystal Springs is its planting. Although the spring months are the most sensational time of year for a visit, the foliage of the rhododendrons and evergreen azaleas is always attractive, making the garden a frequent setting for weddings and a favorite haunt of portrait photographers throughout the year. Whether your interest is in flowers, wildlife or just spending a quiet hour on a park bench in a peaceful setting, Crystal Springs is a delight for anyone who loves the outdoors. It is just one of the reasons why Portlanders are so proud of their city. ☐

LIVING WITH PLANTS

A Gardener's Guide to Practical Botany

by Donna N. Schumann

- Builds on the fundamentals of plant structure, function, and ecology to explain the WHY of gardening techniques.
- For beginners, but contains detailed information useful to experienced gardeners.
- Numerous drawings, photographs, tables, and graphs.

325 pages

7x8½

ISBN 0-916422-20-8

\$14.95 (regular, out of state)

\$15.32 (California residents)



Discount price if you belong to the American Horticultural Society and order directly from them. (See review in *American Horticulturist* Feb. 1981)

The Biology of the BROMELIADS

by David H. Benzing

- A comprehensive treatment of the structure, function, and ecology of bromeliads, including techniques for growing them.
- For "the serious but nonprofessional grower, and the botanist." (Preface)
- Abundantly illustrated.

305 pages

7x8½

ISBN 0-916422-21-6

\$14.95 (out of state)

\$15.32 (California residents)

All prices include postage and handling.

Send check or money order to:

MAD RIVER PRESS—Dept. AHS

Rt. 2, Box 151-B

Eureka, CA 95501

How Does Your Garden Grow?

American Horticulturist is not only filled with beautiful pictures, but also with helpful gardening information which you will want to refer back to time and time again.



Now you can keep your issues of *American Horticulturist* all in one place for quick, handy reference. These attractive binders will hold 18 issues. That's three years' worth of gardening know-how.

Our magazine title is attractively embossed in gold on a rich, leather-like green spine. Easily applied gold numbers are included to help you add dates and volume numbers.

Three or more files for \$5.00 each or \$5.50 for one binder postpaid. Send your check to Binders, The American Horticultural Society, Mount Vernon, Virginia 22121 and we will fill your order promptly.

PRONUNCIATION GUIDE

Guide to Botanical Names in This Issue

The accent, or emphasis, falls on the syllable which appears in capital letters. The vowels which you see standing alone are pronounced as follows:

i—short sound; sounds like i in “hit”
o—long sound; sounds like o in “snow”
a—long sound; sounds like a in “hay”.

Acacia dealbata

ah-KAY-see-ah deal-BAY-ta

Acer albo-purpurascens

A-ser AL-bo pur-pur-AS-enz

Acer buergerianum

A-ser bur-ger-i-AY-num

Acer creticum

A-ser KRET-i-kum

Acer fabri

A-ser FAB-ree

Acer fargesii

A-ser FAR-jess-ee-eye

Acer laevigatum

A-ser lee-vi-GAY-tum

Acer laurinum

A-ser lor-EYE-num

Acer macrophyllum

A-ser mack-ro-FILL-um

Acer oblongum

A-ser ob-LONG-um

Acer oblongum var. *biauratum*

A-ser ob-LONG-um var. by-OR-i-tum

Acer obtusifolium

A-ser ob-too-si-FOL-ee-um

Acer orientale

A-ser or-ee-en-TAL-ee

Acer palmatum

A-ser pal-MAY-tum

Acer paxii

A-ser PACKS-ee-eye

Acer saccharum

A-ser SACK-ar-rum

Acer sempervirens

A-ser sem-per-VEER-enz

Acer syriacum

A-ser SEER-ee-ah-kum

Albizia julibrissin

al-BIZ-ee-ah jew-li-BRISS-en

Araucaria bidwillii

air-ah-CARE-ee-ah bid-WILL-ee-eye

Araucaria heterophylla

air-ah-CARE-ee-ah het-er-o-FILL-ah

Buddleia alternifolia

BUD-lee-ah all-ter-ni-FO-lee-ah

Buddleia asiatica

BUD-lee-ah a-zee-AT-i-ka

Buddleia colvilei

BUD-lee-ah kol-VILL-ee-eye

Buddleia davidii

BUD-lee-ah DAY-vid-ee-eye

Buddleia davidii var. *magnifica*

BUD-lee-ah DAY-vid-ee-eye

var. mag-NIFF-i-ka

Buddleia X farquharii

BUD-lee-ah far-QUAR-ee-eye

Buddleia globosa

BUD-lee-ah glo-BO-sa

Buddleia officinalis

BUD-lee-ah o-fiss-i-NAY-liss

Calluna vulgaris

kal-LOON-ah vul-GAY-riss

Cedrus deodara

SEE-drus dee-o-DAY-ra

Chamaecyparis lawsoniana

kam-ee-SIP-er-us law-sone-ee-A-na

Choisya ternata

ko-ISS-ee-ah ter-NAY-ta

Colchicum

KOL-chi-kum

Cornus nuttallii

KOR-nus nah-TAL-ee-eye

Cryptomeria krip-toe-MEER-ee-ah

sy-fo-MAN-dra be-TAY-see-ah

Cyphomandra betacea

sy-fo-MAN-dra be-TAY-see-ah

Epimedium

ep-i-MEAD-ee-um

Erythrina crista-galli

air-ri-THRY-na KRISS-ta-GAL-ee

Fagraea berterana

fag-GREE-ah ber-ter-AN-ah

Fagraea fragrans

fag-GREE-ah FRAY-grenz

Franklinia alatamaha

frank-LIN-ee-ah ah-la-ta-MA-ha

Gelsemium sempervirens

gel-SEM-ee-um sem-per-VEER-enz

Gordonia lasianthus

gor-DOE-nee-ah lay-zee-AN-thuss

Hibiscus veronica

hy-BISS-kuss ver-ON-i-ka

Jasminum officinale

jazz-MY-num o-fiss-i-NAY-lee

Leonotis leonurus

lee-o-NO-tiss lee-o-NUR-us

Logania vaginalis

lo-GAN-ee-ah vadge-i-NAY-liss

Nelumbo nucifera

nel-UM-bo new-SIFF-er-ah

Nuxia floribunda

NUX-ee-ah flor-i-BUN-da

Paeonia lutea

pee-OWN-ee-ah LOO-tee-ah

Pilea microphylla

PY-lee-ah my-kro-FILL-ah

Pseudotsuga menziesii

sue-do-SUE-ga men-ZEES-ee-eye

Rhododendron macrophyllum

ro-do-DEN-dron mack-ro-FILL-um

Ricinus communis

ri-SEEN-us co-MUNE-iss

Rodgersia aesculifolia

ROD-jers-ee-ah ess-kew-li-FO-lee-ah

Rosa chinensis

RO-za chi-NEN-sis

Sequoia

see-QUOY-ah

Skimmia japonica

SKIM-ee-ah ja-PON-i-ka

Sparmannia africana

spar-MAN-ee-ah aff-ri-KAN-ah

Spigelia marilandica

spy-GEE-lee-ah mar-i-LAND-i-ka

Stewartia X henryae

stew-ART-ee-ah HEN-ree-eye

Stewartia koreana

stew-ART-ee-ah kore-ee-A-na

Stewartia malacodendron

stew-ART-ee-ah mal-ah-co-DEN-dron

Stewartia monadelpha

stew-ART-ee-ah mo-na-DELL-fa

Stewartia ovata

stew-ART-ee-ah o-VAY-ta

Stewartia ovata forma *grandiflora*

stew-ART-ee-ah o-VAY-ta

grand-i-FLO-ah

Stewartia pseudocamellia

stew-ART-ee-ah SUE-do-ka-MEAL-ya

Stewartia rostrata

stew-ART-ee-ah ros-STRAY-ta

Stewartia serrata

stew-ART-ee-ah ser-A-ta

Stewartia sinensis

stew-ART-ee-ah sy-NEN-sis

Strychnos ignatii

STRICK-noss ig-NA-tee-eye

Strychnos nux-vomica

STRICK-noss NUX-VOM-i-ka

Strychnos spinosa

STRICK-noss spy-NOSS-ah

Strychnos toxifera

STRICK-noss tox-IF-er-ah

Thuja

THEW-yah

Victoria amazonica

vick-TORE-ee-ah am-ah-ZONE-i-ka

GARDENER'S MARKETPLACE

CLASSIFIED AD RATES: 50¢ per word; \$10.00 minimum per insertion. 10% discount for three consecutive insertions using same copy. Copy must be received two months prior to publication date. Send orders to the attention of Cindy Weakland, American Horticultural Society, Mount Vernon, Virginia 22121. Or call (703) 768-5700.

AFRICAN VIOLETS

AFRICAN VIOLETS—GESNERIADS—Free pamphlets, "Helpful Hints with African Violets" and "Gesneriad Growing Suggestions" available by sending stamped, addressed envelope to **GESNERIAD—SAINTPAULIA NEWS**, Box 549, Dept. AH, Knoxville, TN 37901.

MINIATURE AFRICAN VIOLETS AND TRAILERS: Special Rainbow Selection, 10 plants for \$16.00. Postpaid airmail. Brochure 25¢. **RAY'S AFRICAN VIOLETS**, RD 4, Box 212, College Station, TX 77840.

AMERICAN HIBISCUS SOCIETY

Annual membership \$10.00. Quarterly publication sent to members. Seed Bank maintained. 100-page full-color book "What Every Hibiscus Grower Should Know" \$7.00 including postage. Learn about hybrids. Write for free fact sheet about the Society. PO Drawer 5430, Pompano Beach, FL 33064.

AZALEAS & RHODODENDRONS

EXOTIC MALAYSIAN/VIREYA and Madeni rhododendron adapt easily from tropical mountaintops to sunny windowsills. Catalog \$1.00. **THE BOVEES NURSERY**, 1737-A SW Coronado, Portland, OR 97219.

DESCRIPTIVE CATALOG of America's largest mailorder selection of super-hardy, landscape-size azaleas and rhododendrons. \$1.00 (deductible). **CARLSON'S GARDENS**, Box 305-AH, South Salem, NY 10590.

BOOK SEARCH SERVICE

Send me that list of wanted gardening books (or detective stories . . .). Out of print, antiquarian, second hand. I'll let you know what I can find. No obligation. Edward F. Smiley, Bookseller, RFD 5, 43 Liberty Hill Rd., Bedford, NH 03102.

BOOKS

THE SMALL GARDEN—Brookes. Macmillan. Discounted to Society members from \$19.95 to \$12.95 (add \$1.25 for postage and handling). Satisfaction guaranteed. **PERIODICAL SERVICES, INC.**, P.O. Box 367, Stockton, NJ 08559.

BOXWOOD BULLETIN

Join the American Boxwood Society for \$5.00 per year and receive quarterly the *Boxwood Bulletin*: Information on varieties, culture, history, etc. American Boxwood Society, PO Box 175, Boyce, VA 22620.

BROMELIADS

10 Bromeliads, medium-size, labeled, different and guaranteed. Three-page listing for stamp. **CORNELISON'S BROMELIADS**, 225 San Bernardino, N. Fort Myers, FL 33903.

THE BROMELIAD TREASURY, Dept. A, offers a selection of decorative species and hybrid Bromeliads at very reasonable prices. Unique

20 page **DESCRIPTIVE LIST**, \$1.00, refundable with first order. Also "Bromeliads for Modern Living," 80 page booklet with 135 beautiful Bromeliad color photos, \$4.00 postage paid. 639 Bend Drive, Sunnyvale, CA 94087. **BROMELIADS**—Over seven hundred species. Excellent house plants, shipping worldwide. Listing one dollar. Deductible on first order. **SEABORN DEL DIOS NURSERY**, Rt. 3, Box 455, Escondido, CA 92025.

BULBS

Three African Pennant Bulbs (Chasmanthe) for early spring bloom, \$6.50. Postpaid, plus Rare Bulb List. **WILLETTS**, PO Box 446, Fremont, CA 94536.

CACTI

CACTI and SUCCULENTS for the Discriminating. Illustrated Catalog \$1.00. **LITHOPS**—floweringsize—5/\$8.50 ppd., includes culture booklet. **NA-DI'S CACTUS**, 659 East Ashton, Grand Island, NE 68801.

All plants greenhouse grown by us. Large selection. 50¢ for catalog. **SCHULTZ CACTUS GROWERS**, 1095 Easy Street, Dept. C, Morgan Hill, CA 95037.

CACTI AND SUCCULENTS

From the wonderful world of cactus, rare, unusual specimens, books, fertilizers, pots. 1981 list 50¢. **BARNETT CACTUS GARDEN**, 1104 Meadowview, Bossier City, LA 71111.

Cactus, Epiphyllums, Lithops, Echeverias and other succulent plants, 95 page Catalog \$1.00. **CACTUS GEM NURSERY**, Dept. H, 10092 Mann Drive, Cupertino, CA 95014.

CACTI AND SUCCULENTS. Rare seeds—wholesale—retail—over 2,000 different kinds: cacti, succulents and other exotics. Send stamp for information on current listings. **NEW MEXICO CACTUS RESEARCH**, PO Box 787 AH, Belen, NM 87002.

CARNIVOROUS PLANTS

WIP—World's largest grower of exotic carnivores, over 75 varieties. Now featuring rare Tropical Pitcher Plants (Nepenthes). Fully illustrated catalog 50¢. **WIP**, Box 303C, Grant, FL 32949.

Carnivorous, woodland terrarium plants and supplies. Book, *The World of Carnivorous Plants*, \$6.50 postpaid. Illustrated catalog 25¢, Peter Pauls Nurseries, Canandaigua, NY 14424.

DAFFODIL BULBS

Naturalizing Mixtures (8+ varieties): Special Mixed Colors or All-Yellow, Bushel \$68; Peck \$21. Postpaid East of the Mississippi. 10% extra West. Free folder features varieties, collections. River's Edge Farm, RD 3, Box 228A, Gloucester, VA 23061.

DIRECTOR OF HORTICULTURAL INSTITUTE

Newly established private non-profit arboretum near Flagstaff, Arizona requires director experienced in all aspects of administration. Orientation is scientific/educational rather than cultural. Some propagation and sales are anticipated. Special focus is on trees, shrubs, herbs of the intermountain area with exotics limited to plants from similar soil, climate, altitude else-

where. Staff is small. Structures and masterplan are still in planning stages. Cooperation with nearby university, natural history museum, USFS experimental station are important. Memberships in AHS and AABGA are important in development. Salary will be determined on basis of qualifications and experience. Send applications with vita to Transition Zone Horticultural Institute, PO Box 927, Flagstaff, AZ 86002.

EVERGREENS-DWARF CONIFERS

Over 100 varieties of dwarf evergreens described by *size, shape, color and texture*. For rock gardens, porch and patio and dwarf conifer gardens. Catalog \$1.00 refundable. **WASHINGTON EVERGREEN NURSERY**, Box 125 AH, South Salem, NY 10590.

FERNS

FRUSTRATED BY FERNS? Identify them the easy way, without using a key! Send \$4.95 for **NAME THAT FERN** by Elliott Blaustein, to **SAFFYRE PUBLICATIONS**, Box 7, Franklin Lakes, NJ 07417.

FLOWER ARRANGING SUPPLIES

COMPLETE CATALOG OF FLOWER ARRANGING SUPPLIES. Foams, containers, accessories, books and tools. Low, low prices—Send 25¢. **THE FLOWER DESIGNERS BENCH**, Box 839 AH, Auburn, NY 13021.

FLOWER JEWELRY

Handpainted enameled flowers on 14kt. gold and sterling silver; earrings, pendants and brooches all featured in our latest catalogue. Send \$1 to John De Salvio Company, 507 Fifth Avenue, New York, NY 10017.

GARDEN FURNITURE

Solid Teakwood Garden Seats—featured in the arboretums & gardens of England. The perfect heirloom gift for church, park or private garden. Send \$2.00 (deductible) for the 10-page British color catalogue and current price list. Precipitation, Inc., 17317 Germantown Rd., Germantown, MD 20767 (301) 428-3434.

GARDENING

"**THE BACKSAVER SHOVEL**"—Our new, narrow cut, tapered shovel moves less earth. Digs smaller, neater holes. **EASIER ON YOUR BACK!** Overall length is five feet—no stooping. Average width is 5" instead of traditional 8½". About ⅓ less in width. The blade itself is a standard 11½" long. Dig the depth you need without disturbing large amounts of soil. Your check includes UPS charges. DC, MD and VA customers please add local sales tax. For a **BACKSAVER SHOVEL** send \$15.00 to: P.I. Tool Supply, 17317 Germantown Road, Germantown, MD 20767.

GREENHOUSE GROWING

PROPAGATION BREAKTHROUGH—Don't gamble—Use only the best mist controls. Guaranteed, versatile, portable, indoor, outdoor, automatic, economical. Write **AQUAMONITOR**, Box 327-B, Huntington, NY 11743.

HARPER HORTICULTURAL SLIDE LIBRARY (PAMELA HARPER)

We supply many of the pictures in this and other garden magazines. You may rent these and 25,000 others, or buy duplicates. Lecture pro-

grams on many topics. Catalog \$1. 219 Robanna Shores, Seaford, VA 23696.

HEATHS AND HEATHERS

HEATHS AND HEATHERS as well as super-hardy, landscape-size azaleas and rhododendrons. Catalog \$1.00 (deductible). CARLSON'S GARDENS, Box 305-AHH, South Salem, NY 10590.

HEDERA

We grow fancy, rare and unusual ivies. Special introductory offers and price list FREE FOR SASE. Ivy Specialists. SWICEGOOD NURSERY, 641 Randolph Rd., Newport News, VA 23605.

HERBS

LAVENDER, ROSEBUDS, POTPOURRI, herbs, spices, essential oils, sachets, soaps, containers . . . Wholesale/Retail Catalogue 50¢. Potpourri Crafting Booklet \$2.00. Tom Thumb Workshops, Box 3496 AH, Alexandria, VA 22302.

HILLTOP HERB FARM, 24 years experience. Herb plants for collectors, Goodies from Gallimaufry Shoppe. Complete catalogue \$2.00 (refundable). PO Box 1734, Dept. AH, Cleveland, TX 77327. (713) 592-5859.

HOUSE PLANTS

UNUSUAL INDOOR PLANTS. 1,800 Varieties—Begonias, Exotics, Geraniums, Cacti, Oxalis, Herbs. Catalog with color \$2.00. Logee's Greenhouses, AH, 55 North Street, Danielson, CT 06239.

RARE—REASONABLE—GUARANTEED—Aglaonemas, Alocasias, Bromeliads, Hydrophytums, Miniature Orchids, Staghorns, Cycads, Palms, Sansevierias, etc. Stamp for list. JERRY HORNE, 10195 S.W. 70 Street, Miami, FL 33173.

Dracaena, Philodendrons, Palms, Euphorbias, Sansevierias, Aloes, Bulbs, Haworthias, Pachypodiums, Adenia, Adenium, Testudinaria, Ipomoeas, Curcubitaceae, Cyphostemma, Raphionacme, Anacampseros, Pelargoniums, Sarcocaulons, Coryledons, Senecios, Othonnas, Didiereaceae, Stapeliads, Sarcostemmas, Ceropegias, Eucephalartos, Bowenia, Lepidozamia, Macrozamia, Cycas, Zamias, Ceratozamia, Dioon, Dischidias, Hoyas, Ferns, Bamboo, Bonsai, Flowering Bushes and Trees, Evergreen Bushes and Trees, Groundcovers, Ivy, Orchids, Orchid Cactus. Free brochure or catalog and newsletters \$4. ENDANGERED SPECIES, 12571(F) Red Hill, Tustin, CA 92680.

ORCHIDS, GESNERIADS, BEGONIAS, CACTI & SUCCULENTS. Visitors welcome. 1980-81 Catalog \$1.00. LAURAY OF SALISBURY, Rt. 41 (Undermountain Rd.), Salisbury, CT 06068 (203) 435-2263.

HOYA SPECIAL

ESTABLISHED HOYAS, 2-3 inch pots, labeled and different, some in bud. Eight each for \$17.95 plus \$4.00 air and insurance. Descriptive list of 100+ hoyas \$1.00. FREE WITH ORDER. SAN LUIS GARDENS, Rt. 3, Box 269A, Dept. AH, San Luis Obispo, CA 93401.

INDOOR TROPICAL PLANTS

HAWAIIAN PLANTS. Our new 1981 catalog is now available and lists many rare and unusual

plants, seeds and gifts. Send 50¢ postage/handling. HANA GARDENLAND, PO Box 248 AH, Hana, Maui, HI 96713.

LILIES

LILY BULBS FOR GARDEN, Greenhouse or Patio. Send 10¢ for 72 page Color Catalog of World Famous varieties. Guaranteed bulbs of the finest quality. REX BULB FARMS, Dept. 33, Box 774, Port Townsend, WA 98368.

MEDICINAL PLANTS

Wild Ginseng, Ginger, Lady's-Slipper, Golden Seal, Cohosh, etc. Now Booking orders for fall delivery. FREE Information. PINE CREEK FARMS, Peterson, MN 55962.

MISCELLANEOUS

PECANS: Quart each halves, pieces, meal. Three-quart sampler \$9.95 postpaid. Tenpeco, Box 638 HO, Rutherford, TN 38369.

Shade cloth for patio or greenhouse. Eight densities available. Custom sewn with reinforced binding and brass grommets. Last for years. Call (404) 778-8654, 24 hours a day. Yonah Manufacturing Company, PO Box 280, Cornelia, GA 30531.

ORCHID GIFTS

MINIATURE ORCHIDS: 22kt. gold-plated pin, pendant combinations. \$23.95, postage included, boxed. Let us choose one for you! Catalogue, \$.50 (refundable with order). Variety items with orchid designs. ORCHIDBOU-TIQUE, PO Box 8824, Elkins Park, PA 19117. (PA residents add 6% sales tax).

ORCHIDS

PHALAENOPSIS ORCHIDS (MOTH ORCHIDS). Excellent opportunity to purchase strong, healthy, previously bloomed plants. Must make room for new crop. Many colors available, our choice \$7.00, three plant minimum, add \$3.00 for shipping. GREEN VALLEY ORCHIDS, Rt. 1, Box 233S, Folsom, LA 70437 (504) 796-5785.

ORCHIDS! ORCHIDS! ORCHIDS! Bromeliads, Staghorn Ferns, Books, Peters Fertilizer Potting Mixes, Supplies for indoor and greenhouse culture. 22 page catalog. 30¢ coin or stamps. FOX ORCHIDS, INC., 6615 West Markham, Little Rock, AR 72205.

"Dancing Dolls," "Lady Slippers," Cattleyas, Dendrobiums, "Moth" Orchids from Blooming size to seedlings. Servo—Revolutionary sugarcane base potting mix for orchids and ferns now available. Information, complete 1981 list of orchids, growing supplies—only 50¢. Greenhouse open by appointment only. (518) 882-9803, Keraseva Ltd., Dept. AH, Consaul Rd., Amsterdam, NY 12010.

TETRAPLOID DAYLILIES

Over 450 hybrids; exotic new Tetraploid Introductions. Catalog \$1.00, deductible with order for plants. SEAWRIGHT GARDENS, 134 Indian Hill, Carlisle, MA 01741 (617) 369-2172. Visitors welcome!

TREE PROBLEMS—BOTANICAL OR LEGAL

For directory of members of the American Society of Consulting Arborists—the experts in tree care and appraisals for legal matters, write:

ASCA, 12(C) Lakeview Avenue, Milltown, NJ 08850.

UNCOMMON SEEDS

THOUSANDS OF RARE AND UNUSUAL seeds from every continent. Also, Barnhaven Silver Dollar Primroses. Catalog, \$1.00 (deductible). FAR NORTH GARDENS, 15621AH Auburndale, Livonia, MI 48154.

Our latest catalog features many new seeds and bulbs not previously offered. If you are a serious grower of uncommon plants, our catalog is specially for you. Catalog 25¢. The Banana Tree, 715 Northampton St., Easton, PA 18042.

WORLD'S LARGEST SELECTION of quality rare seeds from every continent. Thousands of exotic ornamentals, tropicals, houseplants, palms, flowers, bulbs, perennials, trees, rare herbs, medicinal, edible plants. Illustrated 128 page catalog \$1.00. Free vegetable catalog, with European & Oriental varieties. WORLD SEED SERVICE, Box 1058-AT, Redwood City, CA 94064.

FINE ENGLISH GARDENING TOOLS



Smith & Hawken offers the finest durable tools, forged and crafted by hand in England: forks, spades, shovels, women's tools, watering cans, hoes, rakes, trowels, pruners, shears and more.

SMITH & HAWKEN TOOL COMPANY

FREE mail order catalog of classic tools.

68 Homer, Dept. A22, Palo Alto, CA 94301

"Schultz-Instant" LIQUID PLANT FOOD

EASY TO USE
"Just add 7 drops per qt. in the water
Everytime you water, Everything you grow."



Ultra Pure, Concentrated, 10-15-10 Liquid, All Purpose, "Starts & Feeds Formula". Convenient for all indoor and outdoor uses. 3 Sizes.

Available at your store or send \$1.50 for 5 1/2 oz., \$2.75 for 12 oz., \$4.00 for 28 oz. (includes mailing).

"Schultz-Instant" Fertilizer

EASY TO USE
"Just add 1/4 tsp. per gal. in the water
Everytime you water, Everything you grow."



Ultra Pure, Concentrated, 20-30-20, Soluble, All Purpose, "Starts & Feeds Formula". Sizes for Gardens, Vegetables, Flowers, Roses, Shrubs, Trees, Lawns, Greenhouses, Nurseries. 3 Sizes.

Available at your store or send \$2.50 for 1 lb., Small Garden Size, \$9.95 for 5 lb. Lawn & Garden Size, \$33.00 for 25 lb. Estate Size (includes mailing).

By the makers of "Plant Shine"

SCHULTZ CO.—St. Louis, MO 63043

SEND FOR OUR FUND RAISING OFFER

TREE AND HERBACEOUS PEONIES

Largest assortment of named varieties in the world. Also new Chinese Conquest Tree and herbaceous peonies — never before permitted out of China — blue and green flowers

AMARYLLIS—world's largest and finest — 30 color photos —

Send \$2.00 for all catalogs — (credited on first order)

Louis Smirnoff and Son
85 Linden Lane, Brookville, N.Y. 11545



The new Paperwhite Narcissus from Israel (left), and the older French strain.

Paperwhite Narcissus for Indoor Forcing

Lovely, fragrant, and absolutely foolproof

Wise gardeners don't stop growing things simply because the weather drives them indoors. And many rely on successive pots of Paperwhite Narcissus for clean, white flowers on graceful stems and a sweet, spicy fragrance that permeates a room—keeping winter very much at bay. Paperwhites are ideal for forcing because they require no preparation and are completely reliable. *They always bloom.* But then, you knew that. What you may not have known is that a new Israeli strain of Paperwhites (left side in photo) is now available which offers more and larger flowers on stronger stems, a marked improvement on the older French strain.

The bulbs we offer are the largest size commercially available, over 16 centimeters in circumference. In the trade, they're called "exhibition grade" but that's nonsense.

They're exactly what you'd choose for yourself; large, healthy bulbs that will give you more bloom than you've ever seen on a Paperwhite. Their price is fractionally higher than lesser grades and certainly worth it. Also included is an appropriate amount of our bulb fibre—an ideal mixture for potting—and complete cultural instructions. Please order 25 Paperwhites plus fibre, #84322 for \$15.00, or 50 bulbs plus fibre, #84329 for \$26.00. For all orders, include transportation and handling of 10% east of the Mississippi, 15% west. (Connecticut residents please add sales tax.) Phone orders to MasterCard or Visa accounts are welcomed on weekdays at 203-567-0801. This purchase could make the prospect of winter a good deal more palatable.

Sincerely,
Amos Pettingill

White Flower Farm

P l a n t s m e n

Litchfield 7711, Connecticut 06759