



Hardy Fern Foundation Quarterly

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THE HARDY FERN FOUNDATION

P.O. Box 166

Medina, WA 98039-0166

www.hardyferns.org

The Hardy Fern Foundation was founded in 1989 to establish a comprehensive collection of the world's hardy ferns for display, testing, evaluation, public education and introduction to the gardening and horticultural community.

Many rare and unusual species, hybrids and varieties are being propagated from spores and tested in selected environments for their different degrees of hardiness and ornamental garden value.

The primary fern display and test garden is located at, and in conjunction with, The Rhododendron Species Botanical Garden at the Weyerhaeuser Corporate Headquarters, in Federal Way, Washington.

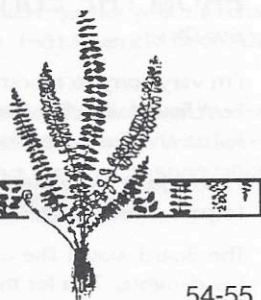
Satellite fern gardens are at the Stephen Austin Arboretum, Nacogdoches, Texas, Birmingham Botanical Gardens, Birmingham, Alabama, California State University at Sacramento, Sacramento, California, Dallas Arboretum, Dallas, Texas, Denver Botanic Gardens, Denver, Colorado, Georgeson Botanical Garden, University of Alaska, Fairbanks, Alaska, Harry P. Leu Garden, Orlando, Florida, Coastal Maine Botanical Garden, Boothbay, Maine, Inniswood Metro Gardens, Columbus, Ohio, New York Botanical Garden, Bronx, New York, and Strybing Arboretum, San Francisco, California.

The fern display gardens are at Lakewold, Tacoma, Washington, Les Jardins de Metis, Quebec, Canada, University of Northern Colorado, Greeley, Colorado, and Whitehall Historic Home and Garden, Louisville, KY.

Hardy Fern Foundation members participate in a spore exchange, receive a quarterly newsletter and have first access to ferns as they are ready for distribution.

Cover Design by Willanna Bradner.

HARDY FERN FOUNDATION QUARTERLY



From the Editor	54-55
<i>Sue Olsen</i>	
Directory Errata	55
Montane Pteridophytes and Angiosperms of Ecuador	55
<i>Alan Smith and Grady Webster</i>	
The Effect of Heat and Drought Stress on Native Ferns During the Growth Cycle of the Following Year	56-60
<i>Ralph C. Archer</i>	
Welcome New Members	60
On Account of Andrew (Cont.)	61-62
<i>Debbie Lamb</i>	
Book Review	63
<i>John T. Mickel</i>	
A New Satellite Garden	64-65
<i>Catharine Guiles</i>	
Fern Forays at Botany 2000	66-69
<i>Robin Halley</i>	
<i>Polystichum braunii</i>	69-71
<i>James R. Horrocks</i>	
Protecting Tree Ferns for the Winter	71-72
<i>Alastair Wardlaw</i>	

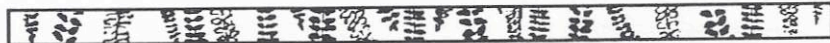
The Spore Exchange Needs You

Please continue to send spores to:

Jocelyn Horder

16813 Lemolo Shore Drive N.E.

Poulsbo, WA 98370



FROM THE EDITOR

Sue Olsen

I'm very sorry to report that as I write this on Sept. 13, John Putnam, our Hardy Fern Foundation President is in the hospital. We all wish him well and hope he is home and feeling better soon.

I know John had a number of items in mind for his President's Report and I'd like to pass these along.

The Board would like to extend our sincerest thanks to Joan Eiger Gottlieb and her daughter Sara for their efforts (and midnight oil) in producing the outstanding new Directory of Fern Gardens, Nurseries and Reserves in the United States and Canada. The feedback has been very enthusiastic for this useful and thorough resource. Extra copies are available for \$10.00. For a copy send a check payable to the HFF to the Editor at 2003 128th Ave. S.E., Bellevue, WA 98005.

Close to three dozen members and guests gathered on September 12 for the dedication of our new Display Garden at the Bainbridge Island Kitsap County Library. Board member John van den Meerendonk designed a tranquil reserve turning a 400 foot long and 50 foot wide strip of useless blackberry infested wasteland into a beautiful and restful visual delight. It is dedicated to the memory of the late Tom Gillies a former board member and Hardy Fern Foundation benefactor. We will have pictures and more complete coverage in the next Quarterly. We'll also feature articles on Ferning in the Lake Cle Elum, WA area, by Sylvia Duryee and Art Kruckeberg, The Role of the Alpine House in the Hardy Fern Garden, by Catharine Guiles and a History of the HFF by Michelle Bundy.

At the request of the Bellevue Botanical Garden John Putnam, Pat Kennar and Sue Olsen put up an HFF educational display for a July plant show and "Concert in the Park". Not realizing that it was to be judged we were surprised and pleased to win a third place prize!

The University of Michigan has established The Warren Herb Wagner Herbarium Endowment Fund to honor Herb. Income from the Wagner Fund will be used to support research and publication in plant systematics by curators, research scientists and students in the Herbarium. Eventually, when the principal of the fund grows large enough, the income will be used to pay the salary and research expenses of a new faculty member in the Herbarium, who will have the title: "Warren Herb Wagner Curator of Pteridophytes." Your board has made a donation in his memory. Members wishing to contribute can do so by sending your gift to:

Professor G. R. Smith, Director
University of Michigan Herbarium
North University Building
Ann Arbor, MI 48109-1057

Be sure to note that the contribution is for the Wagner Fund.
All gifts are tax deductible.

SPORE EXCHANGE! It is that time of the year again. Please gather your material (preferably cleaned!) and send it off to Jocelyn Horder, 16813 Lemolo Shore Dr. N .E., Poulsbo, WA 98370.

Finally, you will find a review elsewhere in this Quarterly of Martin Rickard's new book *The Plantfinder's Guide to Garden Ferns*. It is a marvelous work, both informative and beautifully illustrated. We're pleased to give it our recommendation and glad that there is an increasing interest in gardening with ferns.

Directory Errata

Information received after publication:

California: Univ. Of California Berkeley Botanical Garden - new fee of \$1.00-\$3.00 for general visitors; free on Thursdays. Web site: www.mip.berkeley.edu/garden. For general information: (510) 643-2755.

Maine: Guiles, Catharine and Phil - corrected phone number: (207) 926-4017.

Texas: Casa Flora - preferred address: P.O. Box 41140, Dallas, TX 75241

Montane Pteridophytes and Angiosperms of Ecuador August 2001, 10 days

Alan Smith and Grady Webster

Ecuador harbors one of the most diverse floras on earth and plans are underway to visit and explore several regions of the country. Possible field locations include: the Maquipucuna Reserve, a 4,500 hectare nature reserve that boasts undisturbed cloud forest; Bilsa Biological Station where we will experience a transition zone between lowland and montane forests; and Llanganates National Park where we will have the opportunity to explore the paramo. Our guides will be Dr. Alan Smith, Research Botanist and Curator of ferns at the University Herbarium, UC Berkeley, authority on tropical ferns and fern allies, and Dr. Grady Webster, Professor Emeritus, UC Davis, expert on Euphorbiaceae and author of the newly revised and illustrated checklist of the plants of the Maquipucuna Reserve. These two experts will introduce us to the flora and guide us through the fascinating habitats of this unique country.

The trip is being planned for late summer, 2001. If you are interested in joining us, please contact Staci Markos at the Jepson Herbarium to receive more details. (510) 643-7008 or e-mail: smarkos@socrates.berkeley.edu

The Effect of Heat and Drought Stress on Native Ferns During the Growth Cycle of the Following Year

Ralph C. Archer
Louisville, KY

A previous article (Vol. 10, No. 1, Winter 2000) discussed the condition of locally native ferns grown in Louisville, KY during the drought and heat wave of the summer of 1999. This report discusses the condition and growth of these ferns during the current year (2000) and compares them to the growth of locally non-native ferns.

Winter and early spring rain was ample and the weather turned warm in late February and early March. As a result, many ferns started early growth, particularly a number of Asian species. A hard freeze occurred during the third week of April which killed growth on most ferns. The late spring and summer weather had adequate rainfall except for several two week dry periods.

1. *Adiantum pedatum*, *Osmunda cinnamomea* and *O. claytoniana*.

Established plants in a bed under a large burr oak on one side and a large white oak on the other showed signs of severe stress and frond damage during 1999. Three of four *A. pedatum*, one of two *O. cinnamomea* and the one *O. claytoniana* did not reappear this year. *Dryopteris filix-mas* cultivars in this bed showed mixed performance, apparently as a result of the spring freeze. Those that had significantly broken dormancy were killed back to the ground and took several weeks to resume growth. These specific ferns did not have the vigor nor the frond length during this year's growing season compared to others that had not emerged to any extent. *A. pedatum* in other beds, which did not have such significant competition for water, not only survived but showed almost normal growth. They also showed little damage from the freeze.

2. *Asplenium platyneuron* and *Asplenium rhizophyllum*

Only the two oldest *A. platyneuron* had good growth this year. All started growth early and were damaged by the frost. The *A. rhizophyllum* did not survive the freeze and the youngest *A. platyneuron* is barely alive.

3. *Athyrium asplenoides* and *Athyrium thelypteroides*

These two ferns performed the best of the lady ferns during 1999, and along with *A. cyclosum* performed the best this year with no difference

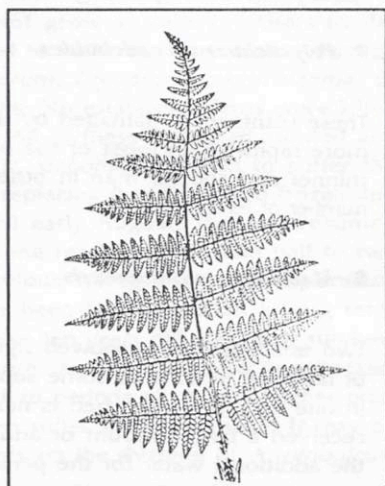
from normal growth. Next in performance would be *A. angustum* and then the European *A. filix-femina* species and cultivars. The native lady ferns showed little frost damage compared to the Asian ferns. The fronds of Asian lady ferns (*A. japonicum*, *A. niponicum* cultivars and hybrids and *A. otophorum*) were killed to the ground and took three to four weeks to resume growth. A *Cyrtomium fortunei*, In this area of the garden, did not show any new growth until mid July after being killed back by the freeze.

4. *Cystopteris bulbifera*

These plants started vigorous growth very early and were badly damaged by the frost. When they resumed growth, it was sparse and dormancy is starting earlier than normal. They did seem to have a higher percentage of fronds with bulblets than normal. They had supplemental water and showed little stress last year. It is probable that the poor performance is due to the freeze. A number of *Asplenium scolopendrium* in the same area also received added water last year. They did not break dormancy until after the freeze and had a normal year.

5. *Dryopteris* species

D. carthusiana, *D. goldiana*, *D. intermedia* and *D. marginalis* are native to this area. *D. goldiana* and *D. intermedia* appear to have performed the best of the locally native *Dryopteris*. They show no signs of any stress from the previous year and made good growth. *D. carthusiana* does not appear to have increased in plant size but shows no sign of stress this year. Three *D. marginalis* sited in morning sun performed very badly. Two started growth which was damaged by the freeze. Neither recovered. One of these plants did not receive adequate water last year but the other two did. The third plant has shorter than normal fronds and looks stressed. By contrast, a newer plant of *D. marginalis* in full shade with good water the previous year looks normal.



Dryopteris intermedia

continued on page 58

The Effect of Heat and Drought Stress on Native Ferns

continued from page 57

There are several exotic *Dryopteris* in the same location as were the three *D. marginalis*. The *D. pseudo-flix-mas* (Mexican male) thrived this year, along with *D. filix-mas* and assorted cultivars and *D. erythrosora*. Next in performance would be the *D. affinis* varieties and lastly most of the Asian species which are just holding their own or struggling.

The North American species (*D. x boottil*, *D. celsa*, *D. clintoniana*, *D. cristata* and *D. goldiana*) in various beds are showing good growth this year. They do not show effects from either the freeze or the hot and dry weather of last year. One *D. clintoniana* that went dormant early last year apparently due to lack of water, reappeared this spring, was killed back by the freeze and has now reappeared with vigorous growth.

6. *Onoclea sensibilis*

These were in the shade in a bed of *Pachysandra* ground cover. They went dormant in the middle of last summer regardless of the water they received. Only one plant showed new growth this spring and then died. It appears that the combination of location, last years dry, hot weather and the spring freeze were a lethal combination. For what it is worth, the 'packy' is still growing although somewhat the worse for wear.

7. *Polystichum acrostichoides*

These plants were damaged by the spring freeze, but started new growth more rapidly than most of the other damaged ferns. They are noticeably thinner and shorter than in other years, although they did have a good number of fertile fronds.

8. *Matteuccia struthiopteris*

Two established beds showed significant damage from the dry, hot weather of last year in spite of some supplemental water. A number of ferns died in one bed. The other bed is next to a new planting of perennials which received a large amount of additional water. The effect on the ferns of the additional water for the perennials was very noticeable. They showed a consistent increase in the number of live crowns and in frond height the nearer they were to the perennials. The freeze did significant damage to both beds as additional plants died after the freeze. In both beds, the plant number and vigor has been significantly reduced. Few plants sent out stolons and none have fertile fronds. By contrast, a new planting that received some additional water, in the high water flood

area next to a creek, had normal growth this year and no damage from the frost. It appears that the water in the creek prevented the freeze from having any effect in the immediate vicinity of the creek. It is clear that this fern is very sensitive to both drought and late spring freezes. The combination seems to aggravate the damage more for this fern than any other native North American species. This fern is not listed as native to Jefferson County, but is included due to discussion in previous articles.

9. *Osmunda regalis* and *Polypodium virginianum*

These were planted last spring, and received ample water. They appeared to have normal growth until the fall freeze. The *O. regalis* showed normal growth and the *P. virginianum* did not appear this year.

Conclusions

The freeze adds a variable that adversely affected the performance of many ferns in the current year. This factor makes conclusions regarding the effect of drought and heat questionable. However, it is a fact of garden life in the central United States, that both moderate droughts and late spring hard freezes occur on a regular basis.

In contrasting the performance of various groups of ferns, it is clear that in general the Asian ferns do not grow as well as others in the Louisville area. The ferns which seemed to suffer the most freeze damage were *Athyrium japonicum*, *A. otophorum*, *Dryopteris crassirhizoma*, *D. sieboldii* and *Polystichum polyblepharum*. No established ferns were killed but several newly planted ones were. All of these ferns had stunted and slow growth for the entire summer. *D. sieboldii* appeared to suffer the most harm. It put up only one frond replacing five that were frozen and it did not resume further growth until early August. The rest resumed growth after three to six weeks, but none reached more than half to two thirds of the frond height of the previous spring. *Athyrium niponicum* varieties are an exception. They have been hardy here on a long term basis. Some in my garden are more than ten years old and have survived lower than minus 15F winter temperatures as well as several late freezes. It appears that many Asian ferns react to periods of warm weather prior to a freeze by starting growth and then suffer serious damage. It may be that the large number of growing points on the rhizome of *A. niponicum* offsets significant loss of early fronds.

Mr. Martin Rickard in an article (2) on the time of frond unfurling found that in general, the Asian ferns in England started growth earlier than the European or New World ferns. He listed several factors which may

continued on page 60

The Effect of Heat and Drought Stress on Native Ferns

continued from page 59

cause early growth. I would like to suggest that avoiding early growth may be a survival adaptation for plants in areas like Louisville, KY USA. It could be that native species have adapted to periods of early warmth followed by hard freezes. Avoiding premature growth could be one factor affecting survival, as the Asian ferns clearly showed less vigor as a result of the freeze. It would be interesting to see if the Asian ferns are native to areas where late spring freezes are rare or non-existent after first periods of warmth. The only fern listed by Mr. Rickard native to this area and grown by me is *Osmunda cinnamomea*. It was found only in a large swamp area which has since been drained. However, growing near standing water provided *Matteuccia struthiopteris* with protection from the freeze in my yard and it is possible that the swamp provided the same protection for *O. cinnamomea*.

The events of the previous year's drought and the current year's freeze clearly demonstrate that locally native plants are more likely to survive adverse conditions than many of those imported from other areas. However, there are a number of exotic ferns which performed very well indeed. The performance of *D. pseudo-filix-mas*, *D. filix-mas* and cultivars, *D. erythrosora*, the European *A. filix-femina* and cultivars, and *A. cyclosorum* was excellent, but all required regular supplemental water to thrive. The events of the past eighteen months have served to separate the truly hardy ferns from the rest as far as this area is concerned.

1. Knouse, John A. The Ferns and Fern Allies of Jefferson County, Kentucky Internet Posting on the American Fern Society Web-Page
2. Rickard, Martin Frond Unfurling, Pteridologist Volume 3 Part 5 - 2000

WELCOME NEW MEMBERS

Kathy Barrick	Dave Luther, Seattle Parks Dept.
Matthew Berryessa	G. Rebecca McCullough
Richard Carl	Sam Norwood
Kathy Carter	Marilyn Olch
Mrs. Luella Cheroke	David R. Peterson, Squirrel Heights Gardens
Sandy Edwards	Robert Pries
Diane Elliott	Phyllis Quinn
Ms. Mary Farrell	Shannon Toal
Ursula Herz	Bors Vesterby
Joan Hockaday	Eleanor Warfield
Don Jacobs	John Wylie
Duane Kerr	

On Account of Andrew (Cont.)

Editor's note: In HFF Volume 3 Number 2, Spring 1993, Debbie Lamb of Miami, FL reported on the devastation caused by hurricane Andrew. Here is her follow-up article.

August 24, 1992 a hurricane named Andrew rearranged our lives. As I'm writing this on August 22, 2000, the news that a hurricane named Debby is now no longer a threat to South Florida is a welcome relief. Phew! For a while I had visions of doing a follow-up article on Andrew, eight years later, by candlelight.

So much has changed. Some changes might have happened anyway, but other changes were precipitated by Andrew.

My patio enclosure is back taller than ever. It houses most of my ferns and my collection of tree frogs. My mist house is now up and running as well.

With the exception of a brush with hurricane Irene last year which necessitated the replacement of most of the screening, everything's been kept intact since Andrew.

I did finally have to cut down a Silk Oak and Black Olive tree from my yard this year. One was dying from rot and the other had been twisted and was a hazard, the damage to both done by Andrew's wrath 8 years ago. I'm still seeing the delayed results of the storm in other people's landscapes as well. I remember noticing numbers of palms in different locations around Dade County that had aborted growth coming from their crowns. Complete palms would be growing perpendicular to the crowns of the parent palm. I saw this occurring for at least three years after the storm. It's only speculation, but I feel that the palm's growing point had been damaged by flying debris to cause them to bifurcate like that. I haven't seen any new examples of this for the last 5 years and all in all, our trees are no longer stumps and most homes have been rebuilt, so a visitor would be hard pressed to find any visible signs of the terrible destruction today.

My plants have always been my therapy. For three years after the storm I worked as environmental chairperson at my children's elementary school. We did weekly plantings and work sessions after school using donated material or cuttings scrounged from trash piles. Our children worked with DERM to restore a protected pineland hammock that was adjacent to the school. In the last year of our work, our club of 60 students, the "Nature Nurturers", received awards from the Sierra Club, The Woman's Garden Clubs of America, a grant from Global Releaf, and recognition in two Miami Herald newspaper articles.

continued on page 62

On Account of Andrew (Cont.) *continued from page 61*

I was also given the volunteer of the year award from Dade County Public Schools for volunteering approximately 2500 hours in one year. We raised money from T-shirt sales to fund the planting of the five trees Global Releaf gave us. On the parent/student/school work weekend we also planted an additional 60 Oaks and Mahogany trees that were donated to us at the last minute.

When both my boys started middle school, I went back to school. I finished a degree in horticulture and became certified as an Arborist. While finishing the degree, I started working with a landscaping firm. After three years I decided to start my own company. My business, Lambscapes, will soon be two years old. It's a design and build company which means I do pretty much everything "in house". I can do the designs and the installations, including hardscaping, irrigation, and lighting. It's hard work, but I'm finally doing what I love.

My 30 year affair with ferns has ballooned to encompass the whole plant kingdom. Presently, I'm concentrating on Begonias. I'm even trying my hand at hybridizing some to be hardier in the landscape. I still grow some tree ferns from spore and am planning a collecting trip (the first in 8 years) later this year.

On a personal note; My husband, the fireman, retired last October. So now he'll be home to help with any future storm preparations and will be able to ride out whatever comes our way, at home, with his family. My children, now 16 and 18 years old, don't seem to harbor any traumas from the hurricane. They were even surprised to learn that Mom had been so afraid during the storm. The fact that school started two weeks later than normal - that they remember, fondly. My oldest just started at the University of Miami to study engineering on a 50% merit scholarship. He's been a grown up since he was ten, but I'm still having the expected separation anxiety. The 16 year old will be off to college in another two years...if he doesn't get signed by a record company first. (or even if he does - hmmm!). He's become an accomplished guitarist and it appears music will be his career.

In conversations with other adults who were here for Andrew, our discussions of our lives are always dated as to "before Andrew" or "after Andrew". For us it will always be a bump in our historical timelines to be remembered and dealt with. I think it changed many people's lives. I know it did for me. I know that nothing matters except my family. That I can "make do" with a lot less. And that nothing brings out the humanity in a person and a community more than experiencing a disaster and sharing in it's aftermath.

THE PLANTFINDER'S GUIDE TO GARDEN FERNS, by Martin Rickard, Timber Press, 133 S. W. Second Ave., Suite 450, Portland, OR 97204 (www.timberpress.com email mail@timberpress.com); hardcover \$34.95. ISBN 0-88192-476-8; 192 pp, 7.5 x 10.25; 121 color photos, 20 line drawings.

Martin Rickard has, I am sure, the greatest private fern collection in the world, with over 1000 kinds of hardy ferns, so he is in a great position to write an authoritative volume on them and their cultivation. We are not disappointed. Most impressive are the color photographs of good proportion, most being 1/4 to full page (or even double-page) in size. Some of them are portraits of individual kinds, but many show groupings of species and their use in landscaping and horticultural shows. Extremely useful are thirteen double-page plates of cultivars and common species, such as *Phyllitis scolopendrium*, *Athyrium filix-femina*, *Dryopteris filix-mas*, *D. affinis*, *Polypodium australe*, *Polystichum setiferum*, and dryland species (*Cheilanthes* and *Pellaea*).

Introductory topics include a detailed history of fern growing in England, choosing ferns for placing in gardens, and detailed explanations of tree ferns, desert ferns, and naming of British cultivars.

The bulk of the book is a listing of about 700 kinds (species, cultivars, etc.) of garden ferns with native origin, height, moisture preference, hardiness zone, and a few lines of comment. The high number of taxa treated reflects the mild climate of Britain (mostly zones 8 and 9) so there is great opportunity for testing of species from around the world. Rickard's own garden boasts not only a fine collection of British cultivars (He has a national collection of *Cystopteris*, *Polypodium* and *Thelypteris*.), but also a wide range of species from many parts of the world. I saw species in his garden that I had seen only in the wild in Mexico. Curiously, *Lygodium japonicum* is reported as hardy only in hardiness zone 9 in England whereas it is hardy in New York to zone 6. There may be other taxa that we can grow in North America that do not do well in Britain, but why is a mystery.

Sections follow on propagation and pests and diseases. Appendices include a glossary, British national collections of ferns, fern societies, fern purchasing sources, suggested further reading, and a listing of parks and botanical gardens with fern collections. (Noticeably lacking in the U.S. is the fern garden at Lyndhurst, Tarrytown, NY described in FF, vol. 19(6): 40-41. 1992).

Rickard's *Plantfinder's Guide to Garden Ferns* is a great book and a must for anyone interested in fern cultivation.

John T. Mickel

Curator of Ferns, Emeritus, New York Botanical Garden

Co-published with Fiddlehead Forum

A New Satellite Garden

Catharine Guiles
Fern Garden Coordinator
Coastal Maine Botanical Garden

On May 22 of this year, Helen Denzler, a Master Gardener, and yours truly met at the Coastal Maine Botanical Garden, in Boothbay, Maine, to create HFF's Satellite Garden. With some of CMBG's other volunteers, Helen had already prepared the trial garden's bed, and therefore we could immediately plant five fern species that had been received the previous fall and, with one exception, held over during the winter, with other perennials, at a garden center. We feared that if we planted them in the late fall of 1999, they would not have time to become adequately acclimatized.



May 2000. Helen Denzler, Master Gardener, takes a final look at the newly planted HFF Satellite Garden at the Coastal Maine Botanical Garden.

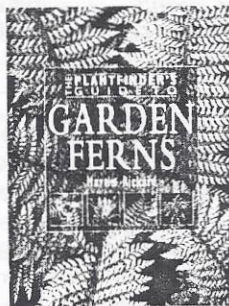
The ferns planted were *Adiantum aleuticum*, *Athyrium filix-femina* 'Frizelliae', *Dryopteris cristata*, *D. lacera* (affinity), and *Woodsia intermedia*. (The A.f.f 'Frizelliae' plants were replacements for ones that we were quite sure had died at the garden center.) To our great delight, the first four grew most vigorously, perhaps encouraged by this summer's cool, rainy weather. The fifth, the woodsia, did not survive, which was disappointing but provides HFF with a datum to add to their fund of information.

On August 21, Helen and I again met at the fern garden to check the progress of the HFF plants and to take some pictures. We also determined how the fern garden can be enlarged to accommodate an influx of new plants. As we were working, several visitors strolled by and we had the opportunity to explain the goals of the joint HFF-CMBG project. We have also received word that other visitors have expressed great interest in this project. For the fall of 2000, we have ordered four more types: *Dryopteris x australis*, *D. polylepis*, *D. pycnopteroides*, and *D. villarilii*. As these are all currently listed as hardy in zone 6, it is indeed experimental to plant them in coastal Maine (zone 5), but, perhaps we will be lucky. We also expect to receive several other species, to be selected by HFF board member Michelle Bundy.


I would like to stress my special thanks to Helen for her enthusiasm for this project, and I would like to express appreciation to Joanne Sharpe, PhD, the chair of CMBG's research committee, who was instrumental in arranging the garden's membership with the HFF and who has overseen all aspects of the work on the fern garden.

As an organization, the Coastal Maine Botanical Garden was founded in 1991. In 1995, it acquired a beautiful 128 acre property, with 3,600 ft. fronting on a tidal river. Since that time, volunteers have created trails, including a fern trail that gives the visitor an opportunity to see many of Maine's common native ferns, cataloged the property's flora, planted a wetland garden and created other amenities, including a library. The organization also offers monthly programs, an annual garden tour, and trips to other botanical gardens. With the garden's growth and through vigorous fund raising, its board is now seeking a paid director. CMBG is a member of the American Association of Botanical Gardens and Arboreta.

Its address is: P. O. Box 234,
Boothbay, ME 04537
(207-633-4333).



The sign for the Coastal Maine Botanical Garden's fern garden.

 **THE HARDY FERN FOUNDATION**
QUARTERLY

The Hardy Fern Foundation Quarterly is published quarterly by the Hardy Fern Foundation, P.O. Box 166, Medina, WA 98039-0166.

Articles, photos, fern and gardening questions, letters to the editor, and other contributions are welcomed!

Please send your submissions to Sue Olsen
2003 128th Ave SE,
Bellevue, WA, 98005.

Newsletter

Editor: Sue Olsen
Assistants: Michelle Bundy
Graphics: Willanna Bradner (cover design)
Karle Hess (inside design)

Fern Forays at Botany 2000

Robin Halley
San Diego, CA

The Botanical Society of America (BSA) annual meetings were held in Portland, Oregon, this year. The various involved societies including the BSA, the American Bryological and Lichenological Society (ABLS), the American Fern Society (AFS), the American Society of Plant Taxonomists (ASPT), and the International Association for Plant Taxonomy (IAPT) sponsored a variety of scientific field trips.

The AFS organized two field trips to the very picturesque Columbia River Gorge. The first trip was titled "Ferns of the Columbia River Gorge" and focused on plants found at sites close to the gorge. The trip was led by Dr. David Wagner of the Northwest Botanical Institute. He is an expert on *Polystichums* in particular and Northwest ferns in general.

David started the trip by reminding us that the fern flora of the Northwest is not very diverse. There are about 100 species of ferns recognized in Washington, Oregon, and Idaho. This is perhaps because 10,000 years ago the entire area was buried under up to a mile of glacial ice and all of the plants found in the region have recolonized in just the last ten millennia. Geologically speaking, that's a short time!

There were about 40 of us on the trip, including AFS president Barbara Hoshizaki, Alan Smith (Berkeley Herbarium), Carl Taylor (Milwaukee Natural History Museum), Cindy Johnson-Groh (Gustavus Adolphus College), and David Lellinger (Smithsonian Institute). We also had Dan Palmer of Hawaii (who has his book on Hawaiian ferns in review in manuscript form) and my friend from our trip to Costa Rica, Layne Hewitt. Layne is one of those people with a great eye for finding ferns along the way and recognizing what she has found.

The trip started with a 30 mile bit of a bus ride from the Portland Convention Center into the gorge.

"The Columbia River Gorge is a spectacular river canyon cutting the only sea-level route through the Cascade Mountain Range. It's 80 miles long and up to 4,000 feet deep with the north canyon walls in Washington State and the south canyon walls in Oregon State." (USDA web site <http://www.fs.fed.us/r6/columbia/>)

We knew that we would only be seeing about a dozen ferns, but a lot of those. As we drove through the fir forest, we began to see stands of Western Sword Fern (*Polystichum munitum*) and Bracken (*Pteridium aquilinum* var. *pubescens*). Further along, we added Lady Fern (*Athyrium cyclosorus* or *Athyrium filix-femina* depending on which fern scientist you subscribe to) and the Aleutian Maidenhair (*Adiantum aleuticum*) and we still weren't out of the bus.

Our first stop was at Crown Point, a high butte overlooking the gorge. It was a little too foggy to see very far, but it was easy to get a sense of the spectacular nature of the gorge. Along the roadside, we added Scouring Rush (*Equisetum*

hyemale) to our list of ferns and fern allies. The next stop was at Wahkeena Falls, one of a multitude of smaller waterfalls that line the gorge. The group followed a trail a short way up the hill by the waterfall. David Wagner pointed out the masses of *Geranium robertianum* (Stinky Bob) that have heavily invaded the gorge understory during the past 10 years.

A little further up the trail, near the base of the falls, we encountered *Selaginella oregana* and a giant banana slug. Continuing up the trail past the falls, we found Parsley Fern (*Cryptogramma acrostichoides*) bedded in with a fascinating collection of mosses and a small plant of Maidenhair Spleenwort (*Asplenium trichomanes*).

The next stop was the most famous of the Columbia River Gorge falls, Multnomah Falls. This was our lunch stop. At the tourist building (Gift shop, ranger station, restaurant, and snack shop) there were examples planted of many of the ferns and fern allies found locally. This gave us our first look at another Scouring Rush (*Equisetum telmateia*). The group took a quick hike up the hill to a bridge overlooking the base of the falls. Along the way we encountered Piggy-Back Plant (*Tolmiea menziesii*) which has been commercialized as a house plant.

Following lunch, we took a very quick bus ride to the trail head for the day's long hike - about two miles overall up and down a pretty gentle grade. Along the trail were many expanses of the Licorice Fern (*Polypodium glycyrrhiza*). The trail curved along the edge of the cliff face in many spots with pretty overhangs of rock populated with colonies of the Irregular Polypody (*Polypodium amorphum*). Further along we discovered small specimens of Brittle Fern (*Cystopteris fragilis*), Mountain Cliff Fern (*Woodsia scopulina*), and Western Cliff Fern (*Woodsia oregana*) that were already shriveled or just about done in by the lack of rain associated with western US summers.

Also along the trail we spotted *Selaginella douglasii* and *Selaginella wallacei*, often in close proximity. Notable non-ferns were penstemons, sedums and Scarlet Paint Brush (*Castilleja miniata*). At the end of the trail near yet another waterfall, you could easily spot wide layers of rock that revealed some of the successive lava flows that had built the cliffs.

Following this hike, we got back into the bus for one final destination, a vista overlooking the more eastern end of the gorge, before our return to Portland. Along the way, we followed the Columbia River for about 20 miles. Most notable were the hundreds of windsurfers taking advantage of the wind squeezed through the gorge. At the vista point we found only a single fern, a *Polystichum munitum*, living in the full sun in the volcanic talus.

The second field trip title was "Ferns of Larch Mountain". We traveled in the very capable hands of Ed Alverson of the Nature Conservancy. The bus trip followed much of the path from the previous day's tour, turning right at the fork leading up Larch Mountain. Ed explained that there are no larch trees on the mountain. The name arose from the early lumber industry's ruse to get more for Noble Fir wood by calling it larch.

continued on page 68

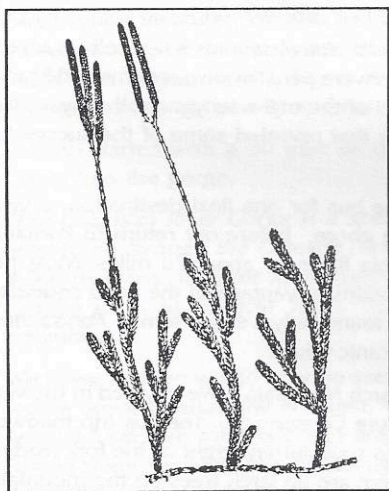
Fern Forays at Botany 2000 *continued from page 67*

After a serendipitous encounter with two male elk in the road (the bus and the elk both went their own ways unharmed), our first stop for this day was near the summit of Larch Mountain. We took a very gentle stroll through the cool woods to the summit. We encountered many of the common ferns on our way to Sherrard Point. At about 4,000 feet, this is one of the highest points in the gorge and affords a wonderful view of many of the surrounding mountains peaks including Mount Hood and Mount St. Helens.

On the way back to the bus the group took a look at some of the non-ferns along the trail including Rattlesnake Plantain (*Goodyeara oblongifolia*) and Coral Bells (*Heuchera micrantha*).

We took another very short bus ride, perhaps a quarter of a mile, to the trail head for the trail we were going to follow for the next four hours. The whole walk was about four miles (two miles down and two miles up), mostly at the botanist's slow but steady pace, punctuated by the occasional excited gathering and discussion of a find. Today's task was going to be more difficult as we had seen many of the common species the previous day!

The walk through the pine forest was, again, gorgeous. The northwest was gripped in a bit of a heat wave, but under the trees at nearly 4,000 feet, the weather was ideal. The first new fern for the day was the Deer Fern (*Blechnum spicant*) with its glossy green leaves and dimorphic fertile fronds. After one false start with a Lady Fern being mistaken for the Spreading Wood Fern (*Dryopteris expansa*), the group found the real thing. Another new fern ally for the trip found during the downhill hike was the Running Pine Clubmoss (*Lycopodium clavatum*).



Lycopodium clavatum

At about the .9 mile mark we took a left turn to follow the flat trail that is the only reminder of the train bed for a logging train. Our next fern find was the Oak Fern (*Gymnocarpium disjunctum*). Here, Ed had the group divide up into teams and try to key out the plants we found versus the closely related and very similar plant *Gymnocarpium dryopteris*. Our group quickly found that we could differentiate with some confidence. That was not the case when we did a similar comparison with plants of *Adiantum aleuticum* versus *Adiantum pedatum*. Here we found that the key only had one or two characteristics that actually provided a differentiation.

The whole group stopped on the trail for lunch and then most of the group headed back for the bus at a leisurely pace. A small group of intrepid hikers made a mad dash for a possible site for Anderson's Sword Fern (*Polystichum*

andersonii), which is characterized by a bulbil near the tip of the frond. The first part of this trek was along a much steeper and less even trail and then the second part was bush whacking cross country.

We broke out of the bush near a large talus slope and noticed that Sherrard Point, our first stop of the day was about 1,000 feet straight up the slope. The first ferns we spotted were Parsley Ferns covering a hillside and in much better shape than the ones we had seen the previous day. The eight of us spread out on the talus slope and looked for the *P. andersonii*. It was quickly found. In the process, we also found two more Clubmosses - *Diphasiastrums*. After some discussion, the identifications were settled on as *Diphasiastrum alpinum* and *D. sitchense*. With both *P. andersonii* and *P. munitum* living in close proximity there was also much rummaging around the underbrush in a vain attempt to find the hybrid between the two. Carl Taylor came closest, but Ed declared it no cigar.

Now it was time to leave, with about 30 minutes to cover the trail the rest of the group covered in an hour and a half. Layne Hewitt led the adventurers out of the wilderness and we all arrived at the trail head only 15 minutes behind schedule but with many rewards and some scratches for our effort. The bus made a beeline for the Portland Convention Center and our two days hunting ferns in the forests of Oregon's Columbia River Gorge became a pleasant memory.

Polystichum braunii Braun's Holly Fern

James R. Horrocks

According to Wherry, this species was named in honor of Alexander Braun, a 19th century botanist, who devoted much of his career to the study of cryptogams (non-seed-bearing plants). He was Professor of Botany at the University of Berlin and also director of the botanical gardens.

Polystichum braunii is a circumpolar species for the most part, native to eastern Asia, central Europe, and North America, mainly in the northeast from the Canadian provinces down through the northeastern states to the mountains of Pennsylvania. It is disjunct in northern Idaho, British Columbia, and Alaska. North American plants are sometimes named var. *purshii*, which differ from Eurasian stock in chromosome number. Those in North America are diploid whereas Eurasian specimens are tetraploid.



Polystichum braunii.
Photo by Richard Young.

continued on page 70

Polystichum braunii continued from page 69

Polystichum braunii is a terrestrial fern, found in moist open woods, thickets, and hillsides, occasionally among rocks, and also along the banks of cold mountain brooks. The soil is usually circumneutral to somewhat acidic. The subevergreen fronds, which tend to be rather deciduous in colder climates, can grow up to two or even three feet in length. (Some authors refer to it as fully evergreen, while most others describe it as subevergreen to even deciduous. Perhaps specimens from different locales exhibit different traits.) With its bipinnate fronds, it superficially resembles a number of other *Polystichums*, especially Asian species such as *P. makinoi*, *P. retrosopaleaceum*, and *P. polyblepharum*, the latter often mislabeled as *P. braunii* in the nursery trade. It could even be confused with *P. aculeatum*, although in *P. braunii* the auricles are not as sharply pronounced, and it is not leathery. The texture of the fronds of *P. braunii* are closer to *P. retrosopaleaceum* than to the harder textured *Polystichums*. It also resembles *P. andersonii* of the Pacific Northwest but lacks the buds forming on the tip of the frond. Side by side, the two species are noticeably different.

Polystichum braunii hybridizes occasionally with *P. acrostichoides* in eastern North America and in the far west it hybridizes with *P. munitum* to form *P. setigerum*, the true "Alaska fern". (Unfortunately "setigerum" has been confused with "setiferum" and the nursery trade has misidentified the English Hedge fern as the Alaska fern. *P. setiferum* does not occur in Alaska or any part of North America.) Other than the slight distinction var. *purshii*, there are no known true varieties of *P. braunii*.

Description: The rhizome is an erect crown with many black, wiry roots and produces a lustrous vase of bipinnate fronds up to three feet in length. The fronds are more often 12 to 24 inches long, being rather thick-textured but only subevergreen for the most part. The stipe is about 1/4 as long as the blade and bears light brown scales that are a mixture, being both broad and narrow. The lanceolate blade is medium to dark green and tapers toward the base. (Here again, there are differences in descriptions. Some authors refer to pale green fronds; others to olive green or dark green. Again, this may depend on its location and the pH of the soil. Acid soils tend to make it darker green. In my garden, the soil is neutral and the fronds are always a medium green.)

Polystichum braunii is one of the earliest ferns to awaken in the spring and the fiddleheads are enclosed in dense silvery scales which change to light brown as the season advances. The pinnae are oblong lanceolate and the pinnules are bristle-toothed and an auricle is present, though not as prominent as in some other *Polystichums*. The sori are round with the indusium attached at the center. The sporangia, as they mature, swell and darken, gradually obscuring the indusium. The sori are not as conspicuous as in other members of the genus. They are borne mostly on the upper half of the frond.

Culture: This species needs a deep, rich, moist soil if it is expected to thrive. Being a denizen of colder climates, it must be protected if grown where the summers are hot and less humid. It should be planted in a cool, sheltered location and deeply mulched to keep it cool. Do not allow it to heat up. The soil

should always be kept moist. In hot weather, it may need misting to keep it happy. Braun's Holly fern does well in the open ground as well as among rocks. The roots can be rather extensive in older plants so it should be given adequate room. Obviously, it is extremely cold-hardy and may be short-lived in warmer climates, especially if the winters are too mild. It is a very decorative fern and should be in every serious collection of ferns. As has been mentioned, other species of *Polystichum* are often mislabeled as *P. braunii* in nurseries. Therefore, caution is needed in properly identifying them as the true plant.

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Protecting Tree Ferns for the Winter

Alastair Wardlaw
Glasgow, Scotland

In response to an inquiry from Willanna Bradner, Bellevue, WA

Dear Lan:

Thank you for your e-mail. Jackie and I have very happy memories of our visit in September 1999, to your delightful garden with its many delights. Also of your hospitality.

Recalling your tree fern, then growing in a pot, I believe you told me it was *Cyathea australis*, but I was not sure of this and thought it might be *C. cooperi*. The latter is the fastest growing of the tree fern species, is propagated on a large scale in the LA area and is widely planted there. I also was told that *C. cooperi* may be sold under the name of *C. australis*. So let's be cautious and assume you have *C. cooperi*. *C. australis* would be much more frost-hardy but would still require winter wrapping.

My experience in Scotland is that *C. cooperi* will not survive unprotected through our Scottish winter with its typical minimum temperature of minus 5°C. I reckon I am in USDA Zone 9a, which should be about the same as you.....*Ed. note: We are cold zone 8.* I would recommend that you 1) gently gather up the fronds vertically and loosely tie them in a bundle. You are likely to damage them, but it can't be helped; 2) construct a wigwam frame of 6, or so, bamboo canes to reach above the top of the fronds and tie them together; 3) get say 4 or 5 plastic 1-litre soft drink bottles and three-quarters fill them with water and assemble them inside the canes and close to the trunk or base of the fern. They are to act as a temperature 'buffer' for preventing the interior of the wigwam getting below freezing point (except in a very prolonged frost). 4) Wrap several layers of

continued on page 72

Protecting Tree Ferns for the Winter *continued from page 71*

bubblewrap, to a thickness of maybe 1-2 inches on the wigwam so as to make a tent, and cover the top with a cap of bubblewrap so that rainwater does not enter. I would build the structure maybe in late October - early November and be prepared to take it off at the end of March, or when Spring sunshine would overheat it. If you have short frosts outside these times when the fern is unwrapped, I would simply have a loose sheet of bubblewrap to throw loosely over the whole plant, to prevent too much chilling.

If the tree fern already has a trunk, I would protect only the trunk with wrapping, and be prepared for the fronds to become frosted and withered, and therefore sacrificed. The essential thing is to protect the apical area from which the fern grows.

I have 6 (different species) of trunked (up to 6 feet) tree ferns planted in the ground, and too big for wigwaming. I wrap the trunks first in aluminum foil (on the same principle of reflecting radiation, as in a thermos flask) and then with a 1.5 - 2 inch thickness of bubble wrap. I shall be particularly careful to cover the crown with both waterproofing and insulation, first with a fringed cap of aluminum foil pushed down around the frond bases, and then with a little cushion of horticultural fleece tied down on top of that. I think the main thing is to prevent winter rain soaking down into the crown and then getting frozen. This system worked very well with a 6-foot trunked *Dicksonia fibrosa* last winter. With this plant I had, in addition, the probe of an electric thermometer inserted in the crown throughout the winter. On cold nights the external temperature registered down to minus six° Celsius, but the apex did not get colder than plus zero point five° C. I think *D. fibrosa* may be the best species, along with *D. antarctica*, for over wintering in our type of climate, and probably yours also.

Tree ferns with 6-foot trunks are readily available in Britain, albeit expensive. A 6-footer costs the equivalent of about \$200 -250.

By the way, the fronds of the *D. fibrosa* stayed green all winter, with only minimal browning at the edges. This tree fern is not in an understory area, and so the fronds were fully exposed to loss of heat to the sky, on a clear night.

I should mention that I have 5 *D. antarctica* with short trunks, about 9 inches and fronds of 3-4 feet in an understory area. I used to wigwam them each winter but then got lazy and did not bother last winter. All of them came through fine, although the fronds were withered after the first hard frost in mid-November. But the main point I want to make is how different these 5 plants are in their vigor. One has put out 9 fronds this summer and one plant has put out only one frond, the rest being in between. Yet they are all within about 1-yard spacing of each other. So one can not generalize on the experience of a single plant. If the only plant had been the one with the single frond I could have reached a very unfavorable conclusion about *D. antarctica*.

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