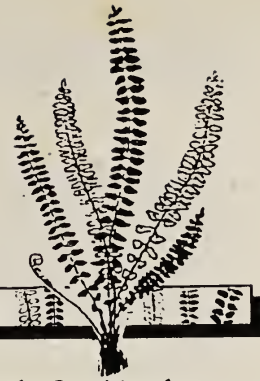


Hardy Fern Foundation NEWSLETTER

Editor Sue Olsen

VOLUME 2 NUMBER 4

FALL 1992



President's Message

GUY HUNTLEY

Fall has finally come to the Pacific Northwest - and what a welcome the rains are! After a dry Summer in our fern gardens, we are all appreciative of the respite from worry and dragging hoses, trying as best we could to fool the ferns into thinking there was no drought. Not so fortunate were those who garden in areas with water restrictions - but thankfully there were no limitations on water use in the HFF's primary garden - the ferns there are in fine shape. A group of dedicated volunteers including Jim Horne, a guest from VA, groomed

the area in mid Sept. so it should be set for the winter.

On October 4th, I had the pleasure of leading a tour of the fern garden at the Rhododendron Species Foundation. It was RSF Members' Day, and the weather was atrocious by any standard. Still, I and those in attendance took a childish sort of joy in stomping through the puddles as we wove through the fern plantings, sharing stories of what did well in our own gardens, and admiring how beautiful the ferns were looking there.

A couple of frosts later, the Athyriums are all a dreadful black - the Thelypterises range from copper to a sort of burnt brown. Several Dryopterises are holding

steady, while the Sensitive fern waves just a couple of still-green fronds - a last hurrah 'til Spring. The ferns are settling in for a winter of rest.

Not so the Hardy Fern Foundation! We just seem to be getting busier! Both Birmingham Botanical Garden and Strybing Arboretum were sent ferns this Fall to plant out and evaluate for hardiness and garden worthiness. The Satellite Garden program is growing ever more tangible and complex - it is an exciting time for us!

Work continues on collections, with new contacts having been made in Australia and New Zealand during Barbara Joe Hoshizaki's latest adventure, and

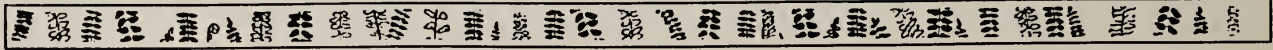
President's Message continued on page 2



L-R James Horne, Jack Docter, Jocey Horder

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President's Message
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tentatively in China through the connections of a new Hardy Fern Foundation member.

The various growers here in the States which are producing new-to-us treasures from spore are doing well with a whole assortment of ferns from every corner of the globe. It is mind boggling to consider the number of species which the Hardy Fern Foundation will be able to send its Satellites and offer its members in coming years.

We will have an educational booth at the Northwest Flower and Garden Show in Seattle over Presidents Day Weekend - please stop by and visit us - or better yet, volunteer to man the booth for a couple of hours! It is great to see the show as well - an event not to be missed! I hope to see many of you there. Until then, I hope you have a great winter!

As most know, Hawaii and Florida were ravaged by storms this past fall. Hurricane Andrew demolished some 75% of the plantings at the Fairchild Botanical Gardens in Florida and Hurricane Iniki destroyed much of the flora at the National Botanical Garden on the island of Kauai in Hawaii. Both of these gardens are being supported by an energetic rescue operation, but both could benefit from public support. Your donations will be welcome and are considered tax deductible contributions. Assistance can be sent to National Tropical Botanical Garden Plant Rescue Fund, c/o Marc Code, National Tropical Botanical Garden, PO Box 340, Lawai, HI, 96765, or to Fairchild Botanical Gardens, 10901 Old Cutler Rd., Miami, FL 33156.

We realize that Hawaii and its climate are not exactly "hardy fern" territory, however most of us enjoy traveling and a little ferning along the way is always welcome. For those of us who were unable to join in this year's AFS outing here's a guideline to some tropical fern trails.

Highlights from a Fern Foray on the Hawaiian Islands of Maui and Oahu

BY: CARL AND JERRY TAYLOR

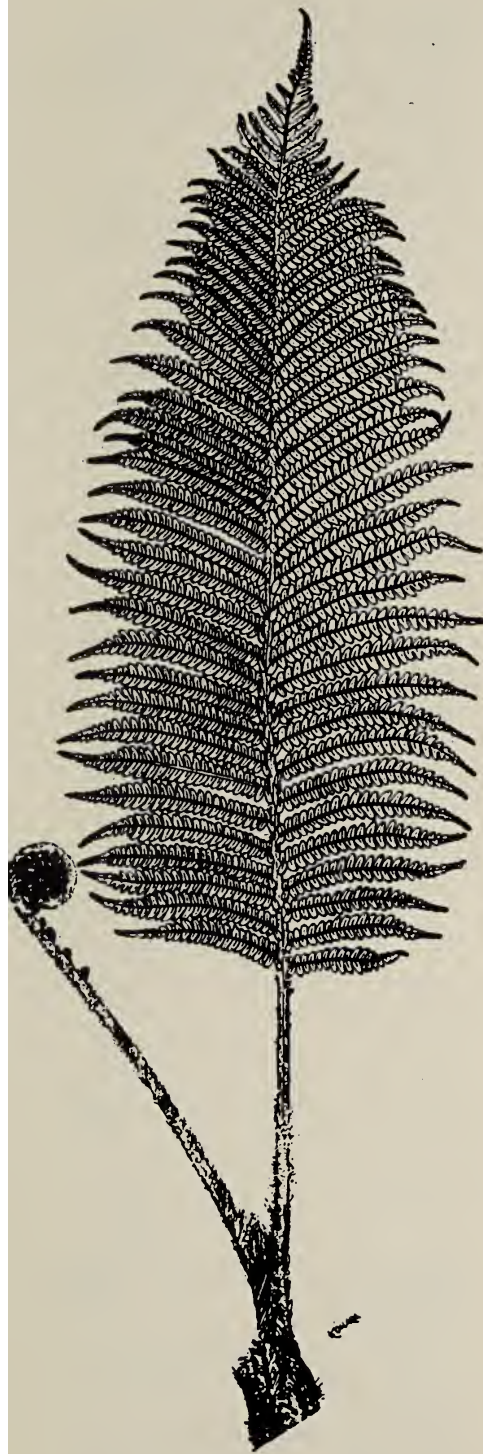
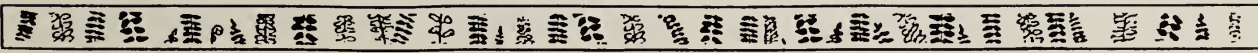
The Hawaiian Islands are emergent volcanic mountain tops in the middle of the Pacific Ocean. Over two thousand miles of ocean separate these islands from the continents of North America and Asia. Thus the Hawaiian Islands exist as one of the most isolated places on earth. This isolation, coupled with adaptation to Hawaii's unique, volcanic landscape, has effected species evolution. Spores have been carried to the Hawaiian Islands by high winds and far-flying birds. Offspring from these spore introductions have evolved into new species through isolation and adaptation. As a result, of the approximately 200 species of ferns and fern allies found on Hawaii, nearly 150 species are Hawaiian endemics.

In conjunction with the 1992 American Institute of Biological Sciences meeting held last August in Honolulu, three days of field trips were organized for those meeting participants interested in Hawaiian ferns. Our expert

leaders were Bob Hobdy from the Department of Lands and Resources on Maui, Dan Palmer, an extremely knowledgeable amateur pteridologist who lives on Oahu, and Herb and Florence Wagner from the University of Michigan, who have studied the ferns of Hawaii for many years. The more than 30 field trip participants also included pteridologists with expertise in various fern genera. It was a joy to be with so many fern experts.

We began on the Island of Maui. The morning of August 7, we drove to the moist forests and rainforests around Olinda on the north slope of Haleakala. Haleakala is the 9,000-foot summit of a gigantic shield volcano which forms East Maui.

Our first stop was along the Waikamoi Road astride a northwest rift at 4,200 feet above sea level. While the western and southern slopes of Haleakala were once covered by mesic forest dominated by *Acacia koa* trees, this northern slope is rainforest primarily of *Metrosidros* (ohia in Hawaiian) receiving between 60 to 100 inches of rainfall per year. This was one of the richest fern habitats on Maui with over 80 species of ferns along a 3 mile stretch of road. Here we stopped to view several species of *Dryopteris* including *D. glabra*, *D. hawaiiensis*, and *D. wallichiana* with its characteristic, blunted ultimate segments. At this stop, and every subsequent stop, we saw mounds of *Dicranopteris linearis* with its distinctive forking fronds covering disturbed soils. This is a beautiful fern but it comes dangerously close to being a weed.



Sadleria

Our second stop, about a half mile east of the first stop, was a wetter forest containing many tree ferns in the genus *Cibotium*, including *C. glaucum* with soft golden hairs covering its stipe bases and *C. menziesii* with coarse black stipe hairs. Here we first viewed the endemic genus *Sadleria*, the chain tree ferns (actually more shrub size) which are related to *Blechnum* and *Woodwardia*. We found *Sadleria pallida* with visible leaf veins, *S. cyatheoides* with invisible leaf veins, and *S. souleyetiana* with basal pinnatifid pinnules strongly overlapping the frond rachis.

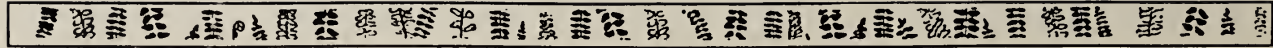
There were also many epiphytic ferns. They included species of *Grammitis*, *Asplenium*, *Elaphoglossum*, and *Lepisorus thunbergianus* with scales covering its sori. Filmy ferns, including a possibly undescribed species of *Gonocormus*, festooned the trunks and branches of trees. Species of *Dryopteris*, *Thelypteris*, *Diplazium*, and *Ctenitis* blanketed the forest floor. One species of *Dryopteris*, as yet undescribed, was characterized by four to five times pinnate fronds over ten feet long, the largest *Dryopteris* in the world.

In the afternoon we walked the Waikamoi Flume. The Waikamoi Flume is a redwood box about two feet square which runs through the rainforest for about a mile. The flume carries water from springs in the rainforest to a reservoir which releases water to the central valley of Maui thousands of feet below where it is used for drinking water and for irrigating crops. As the flume traverses the rainforest it forms a convenient, although sometimes slippery, elevated path and platform from which to view

ferns, if you are not too afraid of heights. Numerous species of ferns are easily observed, examined, and photographed directly from this structure. A small sample of what we saw along the flume were: the lycopods *Palhinhaea cernua*, *lycopodium venustulum*, and *Huperzia serrata X sulcinervia*; the gleichenias *Dicranopteris linearis* with smooth rachises, *Sticherus owhyhensis* with scaly rachises, and *Diploterygium pinnatum* with each large frond producing a fiddlehead uncoiling above two very large, opposite pinnate-pinnatifid pinnae; grammitids in the endemic genus *Adenophorus*, *A. hymenophylloides*, *A. tamariscinus*, and *A. tripinnatifidus* all small ferns with delicately cut fronds; *Polypodium pellucidum* with pinnately lobed fronds and pellucid veins; *Sadleria squarrosa* with its leathery, bead-like pinna segments; several species of *Asplenium*, including *A. unilaterale* with strongly asymmetrical pinnae; *Hypolepus punctata* looking very much like a *Dryopteris*, but with naked medial sori; *Thelypteris globulifera* with free veins and an upright rhizome; and several species of *Dryopteris* including *Dryopteris fusco-atra* with blackish stipe scales, *D. wallichiana* with orange to brown stipe scales, and the rare *D. acutidens* which looks like *Hypolepus*.

The next morning we piled into our four-wheel-drive vehicles and drove up the southwest side of West Maui. We bumped and bounced through rocky pastures for several miles then through grassy meadows to an elevation of 2,800 feet. At our first stop we hiked into a ravine and entered

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Highlights from a Fern Foray on the Hawaiian Islands of Maui and Oahu
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interesting remnant mesic forest. Along the way we saw beautiful specimens of *Pityrogramma austroamericana* with bright yellow farina on the lower surface of its fronds and *Adiantum hispidulum*. In the forest remnant we found the beautifully intermediate interspecific hybrid between *Psilotum complanatum* with flattened, pendulous stems and *P. nudum* with 3-angled, erect stems; *Pteris X hillebrandii* the hybrid between *P. cretica* and *P. irregularis*, *Pteridium decompositum*, the Hawaiian Bracken which looks very much like ours; *Odontosoria chinensis*, with highly dissected fronds bearing cup-like terminal sori; *Doodia kunthiana* with fronds nearly two feet long, *Debaria fenziiana*, with pinnate-pinnatifid fronds bearing dark scales only at the base of the stipe; and *Coniogramme pilosa* with a beautiful network of sporangia tracing the interconnecting leaf veins on the lower surfaces of its fronds.

In the afternoon, and about a mile further up the trail, we hiked into a cloud forest. This forest possessed an eerie atmosphere with gnarled ohia trees (*Metrosideros*) and tree ferns (*Cibotium* and *Sadleria*) silhouetted and looming in the passing mist and clouds. The understory of the forest was dominated by ferns. There were numerous species of *Dryopteris*, *Thelypteris*, and *Asplenium*. There were large specimens of *Athyrium microphyllum* with lacy, 3-5 times pinnate fronds and *Marattia douglassii* with large, twice pinnate,

succulent fronds bearing sporangia fused into boat-shaped synangia. There were also many filmy ferns and grammitids covering tree trunks and branches. We were overwhelmed by the number of different kinds of ferns. It was difficult to leave this beautiful, enchanting forest, drive back down the mountain through areas severely damaged by grazing and subsequent erosion, and think of what Hawaii must have been like before man came.

We then flew to Honolulu on the island of Oahu and the next day, 9 August, we visited Mount Tantalus just north above the city. Here we saw a mixture of both native and alien fern species. Some of the pteridophytes along an easy hiking trail included: *Thelypteris hudsoniana* with pinnate-pinnatifid, glabrous fronds having veins fused to the excurrent veins; *T. cyatheoides* with pinnate, glabrous fronds having veins interconnecting with the excurrent veins; *T. dentata* with pinnate-pinnatifid, hairy fronds having dark stipules and lower pinnae reduced in size; *T. parasitica* with pinnate-pinnatifid, hairy fronds having green stipules and no reduction in size of lower pinnae; *T. cyatheoides X dentata*, *T. dentata X parasitica*; and *Elaphoglossum crasifolium* with thick, leathery, simple dimorphic fronds. In the trees above we spied *Psilotum nudum*, *Phlegmariurus phyllanthus*, and *Ophioglossum pendula* a close relative to *Ophioglossum*, but with drooping strap-like fronds and pendulous sporangiophores. Filmy ferns included *Vandenboschia cyrtotheca* with fronds over 6 inches long and *Gonocormus minutus* with fronds less than 1/4 of an inch

long. We also found *Debaria prolifera* with curious sori stalked beyond the edge of the pinnae; and *Tectaria circutaria* with bipinnate-pinnatifid fronds. Beautiful, naturalized specimens of *Nephrolepis multiflora*, *N. exaltata*, *Microsorium scolopendra*, *Adiantum raddianum*, and *Blechnum occidentale* were everywhere.

Our few notes and frond recollections permit only these highlights of the foray. Much more could have been detailed, but we'll bet by now you also believe that Hawaii is a great spot for ferns as well as for fun. You are correct. We hope you can enjoy a similar trip sometime.

Our leaders and the participants on field trip eagerly shared their knowledge and enthusiasm with us. We consider ourselves indeed fortunate to have had the opportunity to visit with so many fine pteridophytes and pteridophiles.



ASPLENIUM adiantum nigrum

JAMES R. HORROCKS

As plen' i um ā di an' tum - nī
grum

Black Spleenwort

The name "Asplenium" (Greek) is derived from "splen", a spleen. At least one species of European spleenwort was believed to have medicinal value in treating diseases of the spleen. The species name "adiantum" refers to the attributed water-repelling quality of the fronds. The name "nigrum", meaning "black", refers to the nearly black stipes which give way at about the level of the lowest pinnae to the green rachis.

This is an attractive small to medium sized evergreen fern with fairly finely cut distinctively triangular fronds borne on shining deep red-brown or black stipes. Varying from three to eighteen inches in length, depending upon conditions, this species is found growing on a wide variety of well-drained, mostly basic, sandy soils or clay banks and in rock crevices and drywalls of mainly non-acidic rocks. It has a preference for open areas where there is not dense tree overgrowth. It occurs over a wide range in the British Isles, Europe, the Mediterranean area, and extends eastward into western Asia and northward across the Himalayas. Its southern range includes the high mountains of Africa. It is rare in North America, having been collected in northeastern Colorado, northeastern Arizona, and in Zion National Park in



Asplenium adiantum-nigrum

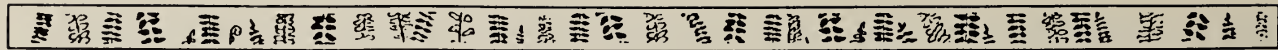
southwestern Utah. There is more recently a report of its growing in almost pure chalk in a Denver, Colorado garden and no one is quite sure how it got there. It is also reported from Hawaii by one author. There may be other places where it has been sighted, but it is certainly elusive, being entirely absent from many areas that would be to its liking.

This species can be highly variable, not only in size, but also in the cut of the frond, including the individual pinnae, and in the frond form. There are extreme examples with narrowly acute or broadly rounded pinnae. Of particular interest are specimens with broadly triangular fronds and very blunt, almost fan-shaped pinnae which occur on serpentine rocks. Occasionally there are plants closely approaching the finely-dissected and comparatively narrow, acutely-tapering pinna form of the much rarer *A. onopteris*. However, *A. onopteris* lacks the scattered dark scales of *A. adiantum-nigrum* on its

frond surface and midribs. Small specimens of *A. adiantum-nigrum* can also be confused with *A. billotii*, but the latter has distinctively ovate-lanceolate outlined fronds, with usually quite short basal pinnae, a shorter stipe, and sori shorter and set nearer to the frond margins. Complicating matters further, *A. adiantum-nigrum* hybridizes with both species mentioned, producing intermediate forms.

Description: The rhizome is short creeping with dark scales and numerous fibrous roots. The fronds can be from three to eighteen inches in length, confusingly variable, but mostly ovate-lanceolate to triangular lanceolate in outline, bipinnate below becoming pinnatifid above. The pinnae are deltoid-ovate to oblong-lanceolate, obliquely inserted, the lower ones narrowed at the base. The lower pinnules are pinnatifid, segments various, ovate to oblong or cuculate, the margins sharply serrate.

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Ferns in a Garden in Maine

By CATHERINE W. GUILLES

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The spring 1992 "Hardy Fern Foundation Newsletter" announced, "We'd like to hear from you!" As I seem to be the only member of the organization from Maine, I feel a duty to speak up for the northeastern corner of our country. The northwestern corner may have enjoyed a "benign" '91-'92 winter, but that was not the case here. We had very little snow cover and several episodes of rain followed by plummeting temperatures, resulting in lots of ice. Everyone I've talked to mourned the loss of perennials, and this applies to ferns as well.

My fern garden—kindly called a "test garden" by a friend who is a landscape designer—is on the wooded property of my seaside summer cottage in Blue Hill, Maine, not far from Acadia National Park (which, by the way, has a fine fern collection at The Wild Gardens of Acadia). The forest is primarily oak, with ash, spruce and balsam fir as well. Many species of ferns grow on the property, which is characterized by rocky, acid soil, and over the years, I've tried to introduce ferns that are native to Maine but which do not grow on our land or in the immediate vicinity. At the end of this essay are lists of my successes (thus far) my failures, and those ferns found

naturally on the property. There is some overlap between the first and third lists.

In developing the garden, I also wanted to try to include ferns that are becoming rare in Maine. Several of the ferns in my garden are on a list prepared by The Garden Club Federation of Maine and the Josselyn Botanical Society of Maine, and distributed by the Maine State Department of Education, which identifies ferns which should not be disturbed when found growing in the wild. These ferns are marked with an asterisk. I hasten to add that I have purchased all my plants except the very common ones growing on our land. I cannot, however, vouch for the source of the seller.

This very informal effort has expanded to include species not found in Maine as well. How could I resist the Japanese painted fern?

Four factors have limited my efforts. First, I am at the cottage only sporadically, our home being in New Gloucester, near Portland. Thus garden care is intermittent. Second, I found that slugs just love many of the non-local species. Little fences of screening, slug bait, and lots of beer are my main weapons in this fight. Third, with two exceptions, I have not been able to grow those species that require alkaline, as opposed to acid, conditions. To do so would require landscaping efforts that seem impractical at present. The two exceptions are the fragile fern and the bulblet fern. I worked marble chips into their soil and applied lime when I think of it, and

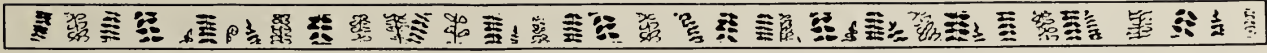
somehow they hold on to life.

Fourth, recently our summers have been characterized by long weeks of drought. The summer of 1992 has been something of an exception to this rule, though it was very dry in May.

In addition to the 20 ferns in the test garden, I have used some of the native ferns in landscaping the cottage. Here are the most successful. The Cinnamon fern is a wonderful, if tallish, ground cover because unlike its cousin the Interrupted fern, it does not collapse on the first cool night but rather turns a warm gold and bears up through the fall, adding to the season's color. Unfortunately, the Interrupted fern is the more common on the property. Interestingly, the beds of combined Cinnamon and Interrupted ferns have created a happy home for New York fern volunteers, and these provide an understory to the taller species.

The Marginal Woodfern is my choice for shaded, rocky sites because it is evergreen and always smart and crisp looking. The same goes for the Christmas fern. The Oak and Maidenhair ferns provide good groundcovers in the same environment. Finally, my little patch of Rusty Woodsia has been growing ever so slowly in a quite sunny rock-garden site. I also added Broad Beech ferns to this location. They are more weedy but welcome.

I am trying an experiment of growing Ostrich ferns as a border to a woodland garden at our New Gloucester property, where the soil is much richer. I hope that there,



they will produce spore-bearing fronds; they do not do so in Blue Hill.

As for ferns of low value, I find it hard to pass judgment on the flora on the property, however lowly, but Bracken and the Sensitive ferns belong in the "weed" category.

My present ambition is to expand the test garden and to that end I recently planted three species which I ordered from Fancy Fronds: *Athyrium filix-femina* 'Fancy Fronds' strain, *Polystichum braunii*, and *Dryopteris celsa*. Edith Bolan Ogden's The Ferns of Maine also gives me ideas for future introductions, such as the Massachusetts fern; however, I see that it requires a boggy habitat, which would be a problem.

For now, I hope the coming winter will be kinder than the last. I also hope the participants in the Fall Fern Foray enjoyed their trip, especially the stop at Bartholomew's Cobble, a choice spot.

FERN LIST
Ferns in the Test Garden

Note: An asterisk indicates that, according to the Garden Club Federation of Maine, working in cooperation with the Josselyn Botanical Society of Maine, these species should not be disturbed when growing in the wild.

Maidenhair Fern
Adiantum pedatum
L. subsp. *pedatum*
Found in Maine *

Dwarf Fibriate Lady Fern
Athyrium filix-femina
"Fancy Fronds" strain.
Cultivar (?): Planted summer 1992

Japanese Painted Fern
Athyrium niponicum 'Pictum'

Silvery Glade Fern
(Silvery spleenwort)
Athyrium thelypteroides (Michx.)
Desv.
Found in Maine *

Bulblet Fern
Cystopteris bulbifera (L.) Bernh.
Found in Maine *

Fragile Fern
Cystopteris fragilis (L.) Bernh.
Found in Maine *

Spinulose Woodfern,
Toothed Woodfern
Dryopteris spinulosa (O.F. Muell.)
Watt
Found in Maine

Log Fern
Dryopteris cristata (L.) A. Gray
Fertile allotetraploid between *D. goldiana* and *D. Ludoviciana*.
Planted summer 1992

Crested Woodfern
Dryopteris cristata (L.) A. Gray
Found in Maine

Robust Male Fern
Dryopteris filix-mas
'Undulata Robusta'
The Male fern is considered endangered and threatened in Maine; however I am sure the experts refer here to the species plant.

Crested Male Fern
Dryopteris filix-mas Cristrata
'The King'

(Doing very poorly). See note under "Robust Male Fern."

Goldie's Woodfern
Dryopteris goldiana
(Hooker) A. Gray
Found in Maine. Listed as of "special concern" in a brochure entitled "Maine's Endangered and Threatened Plants," May 1990.
Grows only about 18" high.

Marginal Woodfern
Dryopteris marginalis (L.) A. Gray
Found in Maine and on our property.

Dryopteris Wallichiana
Planted in 1992
I have been unable to determine the origin of this plant.

Oak Fern
Gymnocarpium dryopteris (L.)
Newm.
Found in Maine and on a nearby property.

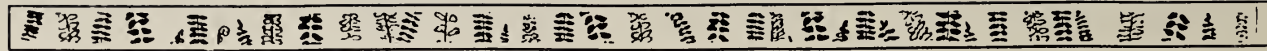
Ostrich Fern
Matteuccia struthiopteris (Wild.)
Morton
Found in Maine. Used frequently in landscaping.

Royal Fern
Osmunda regalis var. *regalis*
'Purpurascens' (?)

Royal Fern
Osmunda regalis var. *spectabilis*
(Wild.) A. Gray
Found in Maine and on a nearby property.

Christmas Fern
Polystichum acrostichoides (Michx.)
Schott
Found in Maine and on an adjacent property.

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Ferns in a Garden in Maine

continued from page 7

Braun's Holly Fern
Polystichum Braunii (Spenner)
Fee Planted summer 1992

Broad Beech Fern
Thelypteris hexagonoptera (Mich.)
Weath.
Found in Maine and on our property.

Rusty Woodsia
Woodsia ilvensis (L.) R. Brown
Found in Maine *

Netted Chain Fern
Woodwardia virginica (L.) J. E.
Smith
Found in Maine

Failures

Ebony Spleenwort
Asplenium platyneuron
Found in Maine *

Holly Fern
Cyrtomium falcatum (?)

Japanese Red Shield Fern
Dryopteris erythrosora

Purple cliff-brake
Pellaea atropurpurea

Hart's-tongue Fern
Phyllitis scolopendrium

A fern unidentified by the dealer,
glossy fronds. Unknown species.
Possibly of the *Polystichum* genus.

Sword Fern
Polystichum munitum

Woodwardia Japonica

Ferns which grow naturally on the property or in adjacent areas.

Note: I have followed J. T. Michel's book for the identification of the Dryopteris species. Even after hours of studying individual fronds with a magnifying glass, I cannot claim that they are correctly identified. I take some heart in noting that these ferns bedevil the experts as well as amateurs.

Lady Fern
Athyrium filix-femina subsp.
angustum (Willd.)

Hay-scented Fern
Dennstaedtia punctilobula (Michx.)
Moore

Marginal Woodfern
Dryopteris marginalis (L.) A. Gray

Evergreen Woodfern
Dryopteris intermedia
(Muhl. ex. Wild.) a. A. Gray

Clinton's Woodfern
Dryopteris Clintoniana
(D. C. Eaton) Dowell

Sensitive Fern
Onoclea sensibilis L.

Cinnamon Fern
Osmunda cinnamomea L.

Interrupted Fern
Osmunda claytoniana L.

Rock Polypody (Common Polypody)
Polypodium virginianum L.

Bracken
Pteridium aquilinum var. *latiusculum*
(Desv.)

New York Fern
Thelypteris noveboracensis (L.)
Nieuwl.

Marsh Fern

Thelypteris palustris var. *pubescens*
(Laws.)

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The Rhododendron Species Foundation

TOM GILLIES

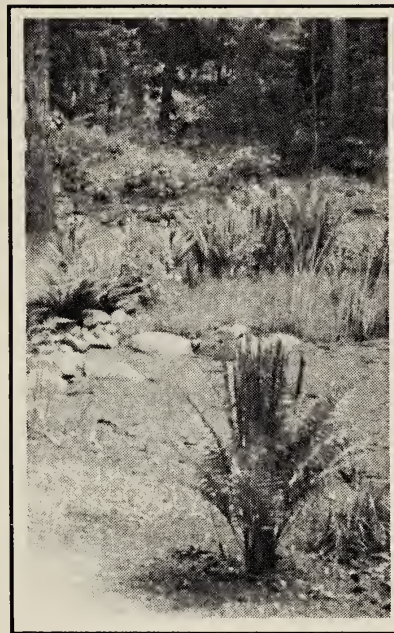
The Rhododendron Species Foundation (RSF) was formed in 1964 by a small group of American Rhododendron Society (ARS) members in Eugene, Oregon. Its basic goal was to "create one of the outstanding centers in the world for growing rhododendron species". The group also sought to conserve species rhododendrons through "documented distribution of plant material". While it was distinctly separate from ARS, all its directors were prominent members of the society.

RSF was incorporated as a non-profit organization in the state of Oregon in 1964 by Milton V. Walker, who also provided space in his garden for the Foundation's original collection of plants. Subsequently, because of Dr. Walker's failing health, the collection of some 2,000 plants was moved to the garden of P. H. Brydon in the Willamette Valley near Salem in May of 1971. In addition to the plants moved to the Brydon garden, acquisition of plant material continued actively. The work involved in maintaining the rhododendron collection was substantial, and had to be accomplished without special funding for help in maintenance.

Moreover, it was recognized that the collection was too valuable to be limited to the space available in the Brydon garden, and also too valuable to be managed by only one person.

That the collection of plants and continuing acquisitions of new forms (especially from the generous cooperation of growers in England and in British Columbia) would expand vigorously was never doubted. By 1974, Brydon's estimate was that about five thousand plants were on hand.

The need to find more space and a permanent home for the species



Osmundas Pond Area - RSF

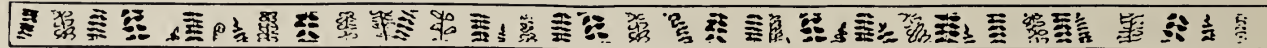
foundation was urgent. Accordingly, the Foundation president, Fred Robbins, the finance chairman, Corydon Wagner, and Brydon arranged a meeting with George Weyerhaeuser, president of the Weyerhaeuser Corporation in Federal Way, Washington. That meeting led to an agreement whereby the corporation would provide a site of twenty-four acres adjacent to its headquarters. The corporation would also make available a propagating house, a

lath house, office and nursery space, in addition to providing power, water, roads. They also volunteered to clear the planting area of unwanted trees and brush. Thus, to a setting of Douglas firs, vine-maples, dogwood, near Weyerhaeuser's architectural-award winning headquarters building, RSF had come, not to rest, but to flourish.

Responsibility for maintenance and development of the collection remains with RSF. A membership program, through which both funds and volunteers could be solicited was begun in 1974. The plants in Brydon's garden were moved that same year. One measure of the success the Foundation has met with over the past 18 years is the *Plant Distribution Catalog 1992 (No. XXI)*. It runs to 37 pages of listings for rhododendron species available for distribution to their members. Each plant offered has been propagated by cuttings or grafts to ensure an exact duplicate of plants from the garden. Each new plant bears a RSF number and is thereby guaranteed for its authenticity. That kind of assurance of reliability had, from the beginning, been an important aspect of the founders' plans.

Negative numbers can also be convincing in the reverse of success. In a description of the Annual Garden Campaign, the RFS president, Donald King, noted that the 1992 spring plant distribution had been such a success that they were unable to fill \$21,000 in orders because of insufficient propagating facilities.

Continued on page 10



The Rhododendron Species Foundation
continued from page 9

When Weyerhaeuser prepared the site for the RSF move into its new location, underbrush, such as the ever-present blackberry vine, was removed. However, many appropriate companion plants for rhododendrons were preserved, among them the native salal, trilliums, ferns, Oregon grape, huckleberry. Rotting tree trunks and windfalls were saved to enhance the natural setting and to provide nourishment for plants then, and in future. Besides plants indigenous to the local forest floor, other companion plants indigenous to native areas of rhododendrons being newly added to the garden have been added. Among these are *Acer griseum*, *Amerlanche* 'Saskatoon berry', *Cercidiphyllum japonicum*, *Enkianthus companulatus*, *Fothergilla monticola*, *Hamamelis mollis*, *Stewartia*, and *Styrax*. On the same basis, additional plant material will be included in future plantings.

The Hardy Fern Foundation (HFF) has also participated in development of the RSF garden. With encouragement from RSF, its display garden has been expanding in recent years. The total number of ferns now in the HFF display garden has reached 313. Among these are 91 different kinds of ferns, and new species and forms are being added from time to time. The setting is, of course, remarkably congenial to ferns, as they thrive in the kind of forest duff that is characteristic of the RSF garden.

The RSF garden is open to the public from 11:00 a.m. to 4:00 p.m.

Saturday to Wednesday in March through October, and Sunday to Wednesday, November through February. For members, the garden is open seven days a week if arrangements are made in advance of the day on which they plan to visit. Membership is available to anyone, in nine different categories, ranging from Student membership at \$15 annually to Patron membership at \$1,000.

The membership program was initiated in 1974. Interest in it was fairly immediate, and there are now 1,060 active members, who enjoy a variety of benefits of membership, as well as the pleasures of supporting an institution in which they have special interest. Further evidences of RSF maturity are regularly seen in the Newsletter. Recently, for example, there have been two articles on "Master Planning" for a public garden. An announcement has been made that RSF has been awarded a General Operating Support Grant from the Institute of Museum Services. The July 1992 issue reported that a new director for RSF had been appointed, and the October 1992 issue notes he has joined the staff.

The recently appointed director is John T. Fitzpatrick, whose most recent post was at Monticello, where he oversaw the establishment of the Thomas Jefferson Center for Historic Plants. Before directing that enterprise, he has been Assistant Director of Horticulture at White Flower Farm in Litchfield, Connecticut, and the Garden Curator at Bressingham Gardens near Diss, Norfolk, England, where he worked under the direction of Alan Bloom. That

he has now taken up new duties and has expressed enthusiasm for RSF activities, personnel, and site bode well indeed for the Foundation's continued development as a world-wide horticultural institution.

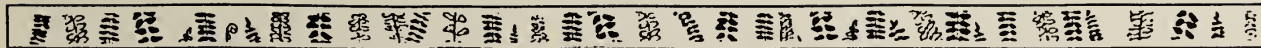
Fern Garden Directory

The HFF is launching a long term project in an effort to produce a Directory of Fern Gardens in the US. The intent is to include both public and private gardens that include ferns and fern allies; whether the gardens are open to the public or by appointment; whether or not there is a charge and other pertinent information. Would you please send information about your garden, your neighbor's garden or public gardens in your vicinity to Sue Olsen, 2003 128th Ave. SE, Bellevue, WA 98005. (I have a chairperson in mind for this, but since I've not yet fielded the request my address will do!) Please don't be shy and please don't assume that someone else will volunteer the information for your area. We want this to be a complete compilation. Thanks.... it will be a visitor's guide for us all.

Articles Welcome

Please send any articles to:

Sue Olsen
2003 128th SE
Bellevue, WA 98005



Asplenium adiantum nigrum continued from page 5

The undersurface of the blade bears sparsely scattered, small, narrow dark scales, visible under a hand lens, and found especially along the pinna midribs. The sori are oblique, at very acute angles, oblong, and found over much of the undersurface of most fronds. The indusia are pale, linear, entire, and opening inward. The spores are sooty black and produced in abundance.

Memorial

It is with great sadness that I share this letter from Jeremy and Linda Kaye, the son and daughter-in-law of the late Reg Kaye. Reg was an outstanding contributor to the world of fern knowledge, and his 1968 book HARDY FERNS is still the reference of choice for most enthusiasts. He was a kind, loving and generous man with a wonderful sense of humor. It was a privilege to have known him and we shall all miss him. Our sincere condolences to his family.

Waithmans House, Silverdale 29-9-92

Dear Sue Olsen:

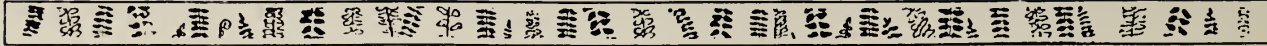
I am writing to let you know the sad news of my father's death, on 31 August. As you know, he had not been at all well for the last year, having to go in for transfusions every three or four weeks, for his acute anaemia. We were glad that we were able to look after him at home amongst his familiar surroundings. Sadly he was not able to get out into his garden very much, but we took him out several times to see friends and relations, and also into his beloved Lake District, where so many of the ferns grow that he loved. He remained very cheerful, and slipped quietly away in his sleep, by his own fireside with his family around him.

We had a great 90th birthday party for him in April, which he really enjoyed, the house was full of family and friends.

Fortunately, he was well enough this summer to go to Lancaster University to receive an Honorary Master of Science Degree from Princess Alexandra. Linda and I took him and we all had a great day. He really enjoyed himself

Best wishes from us all here at Silverdale. Linda & Jeremy





A Fern Reserve

By JOAN E. GOTTLIEB

The greatest challenge to preserving biodiversity is the conservation of appropriate habitat.

For some species, like grizzly bears, square miles of space are required; for others, like the robin, a suburban back yard suffices.

Often, it is the quality, rather than the quantity of the space that is paramount. A Venus' Flytrap grows on a mere fist-size piece of land, but that land must be acidic, moist, sandy savannah without



Walking-Leaf
(*Camptosorus
rhizophyllus*) x½

severe frost. By contrast, a Walking-Leaf Fern requires about the same amount of space, but it must be on an alkaline rock such as limestone.

In western Pennsylvania, about a thirty minute drive west of downtown Pittsburgh, lies the Raccoon Creek Wildflower Reserve. It is only 314 acres in size but contains such a variety of habitats that it supports twenty-five species of Pteridophyta (ferns and allied

plants). That's more than six percent of the 385+ species known from all of North America. The reserve is also home to over 500 species of flowering plants, some of which are now quite rare in the state (Snow Trillium, Closed Blue Gentian, Lily-leaved Twayblade, Pink Lady Slipper, Dwarf Larkspur and others). The tract was purchased in the early 1960's by the Western Pennsylvania Conservancy and was subsequently transferred to the Department of Environmental Resources which administers all of Pennsylvania's State Parks.

The Wildflower Reserve has five miles of developed trails which meander through oak-hickory forest, pine and spruce groves, an abandoned field undergoing succession to meadow/prairie, shale rock outcrops and a long stretch of flood plain forest and riparian bottomland along Raccoon Creek. All in all, it is a gem of a place, where habitats exist to satisfy some of the most fastidious plants of the area, and where they thrive and can be enjoyed by the casual naturalist or the serious scientist alike.

Most of the reserve's pteridophytes can be seen in one easy stroll starting behind the Visitor Center on the Wagon Trail and then turning left onto the Jennings' Trail which soon parallels the broad creek. The first, and most exciting fern one encounters is the Adder's Tongue (*ophioglossum vulgatum*) which covers a sizable plot of second growth woods just past the building at the start of the Wagon Trail. An intermittent seep feeds the area with vital moisture, and by the end of July the fern fanatic can

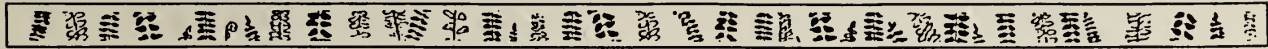
delight in flicking clouds of pale spores from the Adder's fertile spike (the tongue). This charming and elusive plant is only three to eight inches tall and blends in exquisitely with surrounding grasses and herbs, so is easily overlooked. It is a "prayer bones" find.

Another rare fern in the reserve is Goldie's Fern (*Dryopteris goldiana*).

A stand containing several vigorous specimens is found in a trough along the Jennings Trail which fills with runoff water during heavy rains, but then drains fairly quickly. The large fronds (three feet long and twelve inches wide) with their deep blue-green color and sori (spore clusters) near the midvein distinguish this striking wood fern from the related and abundant Marginal Shield Fern (*Dryopteris marginalis*). The latter is easily



Adder's Tongue
(*Ophioglossum
vulgatum*) x½



recognized by its smaller leaves (up to two feet long and ten inches wide) bearing sori along the frond margins. Perhaps in the future a botanist will find the hybrid of these two wood ferns (*Dryopteris x neo-wherryi*) which has sori half way between the midvein and the

margin of the leaf. This wonderful hybrid occurs in nearby Ohio.

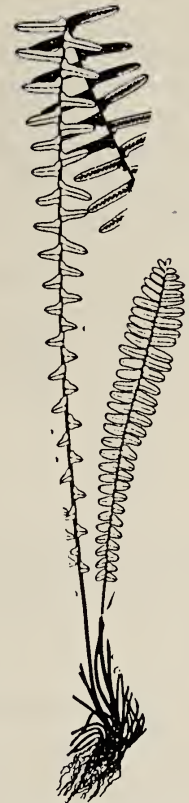
On steep, sedimentary rock cliffs above Goldie's Fern grows a robust stand of Walking-Leaf Fern (*Camptosorus rhizophyllus*). It is impressively fertile in mid to late summer with distinctly elongated sori scattered over the leaf undersides. Especially

eye-catching are its attenuated frond tips which uncoil in the fiddlehead pattern so typical of ferns, but then arch back toward the supporting calcareous rock, nestle into tiny, soil-filled fractures and produce baby plants in famous "walking-leaf" fashion. Thus, this population of hundreds of plants may be a clone of one successful, ancestral spore which colonized the cliff a long time ago.

Festooning the same rock ledges



Maidenhair Spleenwort (*Asplenium trichomanes*) x1



Ebony Spleenwort (*Asplenium platyneuron*) x1

Spleenwort (*Asplenium platyneuron*). Perhaps one day a dedicated pteridomaniac may find the sterile hybrid between these two spleenworts (*Asplenium X virginicum*), and/or the hybrid of the Ebony Spleenwort and the Walking-Leaf Fern known as Scott's Spleenwort (*Asplenosorus x ebenoides*). The

are some magnificent specimens of Maidenhair Spleenwort (*Asplenium trichomanes*). Their leaf rosettes ring the rock crevices in near-perfect circles. Nearby, along the trail, grow many plants of a cousin species - the Ebony



Glade Fern (*Athyrium pycnocarpon*)



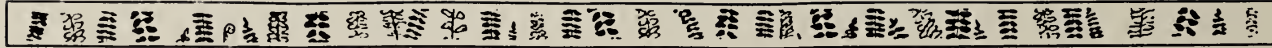
Silvery Glade Fern (*Athyrium thelypteroides*) x1/8

once pinnate fronds, broad and compact if sterile, narrow and elongated if fertile, and with the linear sori characteristic of the genus. The related Silvery Glade Fern (*Athyrium thelypteroides*) is harder to find in the reserve, but several plants grow in damp, low-lying sites, displaying their sharply tapered fronds and the characteristic silvery coverings (indusia) over the young sori. The common Lady Fern (*Athyrium filix-femina* var *angustum*) is also present as is its striking forma *rubellum* with wine-red stalks. Thus, all three of Pennsylvania's native Lady Ferns (*Athyrium*s) are found in this one, small area.

Among the fern allies there are carpets of Running Cedar (*Diahasiastrum [Lycopodium] digitatum*) at woodland edges, pockets of Field Horsetail (*Equisetum arvense*) in sandy areas near streams and large clumps of Meadow Spikemoss (*Selaginella*

latter is generally sterile, but it propagates asexually in the manner of its Walking-Leaf Fern parent.

Other uncommon ferns of note that can be found at trailside include the Glade Fern (*Athyrium pycnocarpon*) with its handsome



apoda) co-mingling with the grass near the Visitor Center. A complete list of the twenty-five species and their varieties found at the Raccoon Wildflower Reserve follows.

The fact that a rich diversity of ferns and higher plants have found a home at the Raccoon Reserve suggests the great value of identifying and preserving these rich habitats before they are claimed by the bulldozer for yet another mall or still more suburban sprawl. By demonstrating how many species (including rarities) live in such places, land conserving organizations like the Nature Conservancy or The Western Pennsylvania Conservancy can become active in the purchase of these key properties at critical times. Then they can be turned over to government administrative entities to remain forever wild while allowing educational and compatible recreational uses by the public. Each area preserved must be self-sustaining, i.e. have a sufficient watershed share, no influx of toxics, harmful sediments or other pollutants. The Raccoon Reserve, by example, is adjacent to sizable Raccoon Creek State Park, giving it a well protected buffer zone from future land development.

Humans have played a dominant role in claiming much of the earth for our own needs or wants. It is time to look to the needs of the other species with which we share the planet and to preserve the habitats needed for their survival. The next generation of food crops, medicines, useful chemicals and an irreplaceable genetic "bank" are represented by these species. This bio-diversity is vital to our own

survival, enjoyment, scientific advancement and last, but hardly least, our conscience. Our grandchildren will not forgive our failure to act wisely in matters of their natural heritage.



Lady Fern (*Athyrium filix-femina*) x1/8

FERNS OF RACCOON STATE PARK WILDFLOWER RESERVE

Most of the park's ferns and allies can be found along the Jennings and Wagon Trails.

ADIANTUM PEDATUM - Maidenhair Fern

ASPLENIUM PLATYNEURON - Ebony Spleenwort

ASPLENIUM TRICHOMANES - Maidenhair Spleenwort

ATHYRIUM FILIX-FEMINA "ANGUSTUM" - Lady Fern, Northeastern variety

ATHYRIUM FILIX-FEMINA "ANGUSTUM RUBELLUM" - Lady Fern, Northeastern variety with wine-red rachis and stipe.

ATHYRIUM PYCNOCARPON - Glade Fern

ATHYRIUM THELYPTEROIDES - Silvery Glade Fern

BOTRYCHIUM DISSECTUM "OBLIQUUM" - Grape Fern, Broad Pinna Form

BOTRYCHIUM DISSECTUM "DISSECTUM" - Grape Fern, Dissected Pinna Form

BOTRYCHIUM VIRGINIANUM - Rattlesnake Fern

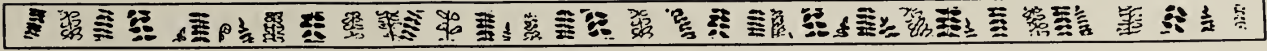
CAMPTOSORUS RHIZOPHYLLUS - Walking-Leaf Fern

CYSTOPTERIS FRAGILIS - Fragile Fern

DENNSTAEDTIA PUNCTILOBULA - Hay-Scented Fern

DIPHASIASTRUM DIGITATUM - Running Cedar
(*Lycopodium digitatum*; *Lycopodium flabelliforme* are alternate names)





DRYOPTERIS CARTHUSIANA - Spinulose Wood-Fern

DRYOPTERIS CRISTATA - Crested Shield-Fern

DRYOPTERIS GOLDIANA - Goldie's Wood-Fern

DRYOPTERIS INTERMEDIA - Glandular Wood-Fern

DRYOPTERIS MARGINALIS - Marginal Shield-Fern

EQUISETUM ARVENSE - Field Horsetail

MATTEUCIA STRUTHIOPTERIS - Ostrich Fern

ONOCLEA SENSIBILIS - Sensitive Fern

OPHIOGLOSSUM VULGATUM - Adder's Tongue Fern

POLYPODIUM VIRGINANUM - Rock Polypody

POLYSTICHUM ACROSTICHOIDES - Christmas Fern

SELAGINELLA APODA - Meadow Spikemoss

THELYPTERIS NOVEBORACENSIS - New York Fern

*If you have not renewed your membership, this will be your last issue.
If you have, please pass this along to a friend.*



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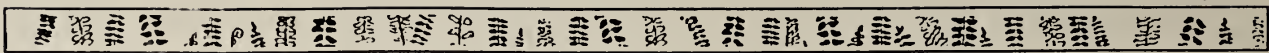
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I would like to help. How can I volunteer?



Volunteers Needed

The Hardy Fern Foundation will be sponsoring a booth at the Northwest Flower Show at the Seattle Convention Center from Feb. 11 to Feb. 15. This is a wonderful opportunity to promote our society's goals to the public, display our accomplishments and encourage community participation. However, we must man the booth during the entire five day period. Bring your enthusiasm and join our promotional group. In addition to helping the HFF you will receive a free pass to the show for your 2/4-hour commitment. For further information or to volunteer your help please call Anne Holt, 842 4103.

COMING IN APRIL!!

The Rhododendron Species Foundation Sale

April 3, 1993

Federal Way, WA

Aboretum Foundation Sale

April 17th, 1993

Seattle, WA

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