



**Hardy Fern Foundation
Quarterly**



Winter 2010

THE HARDY FERN FOUNDATION

P.O. Box 3797

Federal Way, WA 98063-3797

Web site: www.hardyfernfoundation.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 Birmingham Botanical Gardens, Birmingham, Alabama, California State University at Sacramento, California, Coastal Maine Botanical Garden, Boothbay, Maine. Dallas Arboretum, Dallas, Texas, Denver Botanic Gardens, Denver, Colorado, Georgeson Botanical Garden, University of Alaska, Fairbanks, Alaska, Harry P. Leu Garden, Orlando, Florida, Inniswood Metro Gardens, Columbus, Ohio, New York Botanical Garden, Bronx, New York, and Strybing Arboretum, San Francisco, California.

The fern display gardens are at Bainbridge Island Library, Bainbridge Island, WA, Bellevue Botanical Garden, Bellevue, WA, Lakewold, Tacoma, Washington, Lotusland, Santa Barbara, California, Les Jardins de Metis, Quebec, Canada, Rotary Gardens, Janesville, WI, 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

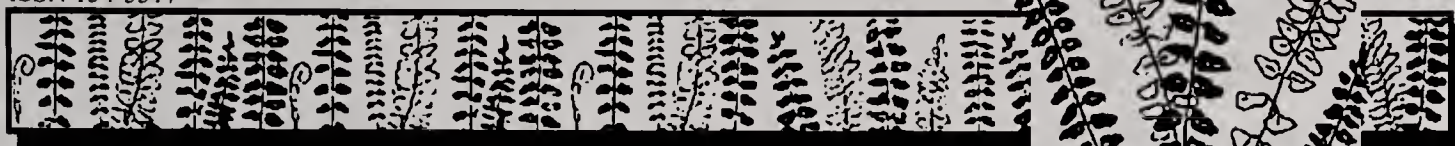
THE HARDY FERN FOUNDATION QUARTERLY

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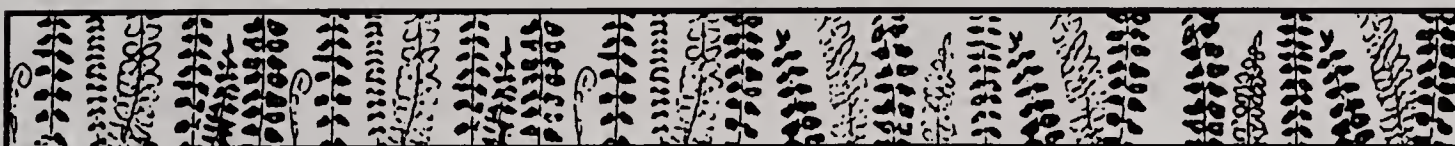
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President's Message

January 1, 2010 was a very special day, the beginning of the third decade of The Hardy Fern Foundation, the second decade of the New Millennium and yes, the weather was mild and inviting. New projects are coming to mind as prior accomplishments become part of our history and legacy.

An established and maturing stumpery at the Rhododendron Species Botanical Garden and evolving fern garden in the Bellevue Botanical Garden, are but two of recent happenings for our organization this past year.

Our new and enlarged hoop house at the Hardy Fern Foundation headquarters provides greater capacity to accumulate more and greater varieties of ferns: perhaps, even some of the less temperate tree ferns and taxa from the Southern Hemisphere.

Presently, we are focusing on the upcoming Northwest Flower and Garden Show, February, 4th to 9th, 2010, with an educational display, featuring our new stumpery. To our pleasant surprise, a flurry of interest has occurred in the local gardening community concerning this new garden feature.

Under consideration, are ways to replace capital expended for the stumpery. This includes interest in a second fern sale, perhaps, in the fall. An increase in the amount of ferns at sales is also being considered. "To be a success at gardening, one must be daring, be first and be different!"

We are nearing completion of a long term operating agreement with the Rhododendron Species Foundation, documenting the terms and conditions governing our presence at this location which we have occupied for the past 20 years. All items, materials and services utilized by our operation, will be spelled out in detail, thus recognizing all things which were previously, taken for granted or just assumed.

In early October, 2009, members of the Hardy Fern Foundation accompanied by members of the British Pteridological Society, embarked on a two week tour in Central California. This proved to be both enjoyable and extensive. We visited numerous arboreta, state and federal parks and private fern gardens. Please see related articles in this and future issues of the Quarterly.

We will be revisiting our Affiliate (Satellite) Garden program in an attempt to facilitate and analyze collected data. This could involve a different and easier method for participating gardens to report findings.

I would like to thank all of our Board members for their loyal support this past year and especially, so many of the generous volunteers who provided so much needed assistance with our numerous projects. We will always welcome any and all participation by members of the Hardy Fern Foundation, as this is your organization too.

Happy New Year to everyone.

Best Regards,
Patrick D. Kennar
President, Board of Directors

Ohiophyle - A Botanical Treasure in Western Pennsylvania

Joan Eiger Gottlieb
Pittsburgh, PA

Fifty miles southeast of Pittsburgh PA, in the Laurel Highlands section of the Appalachians, lies the tiny town of Ohiopyle. This dot-on-the-map destination is actually a glorious gateway to world-class whitewater rafting, amazing Ohiopyle State Park (including botanically-rich Ferncliff Peninsula), Bear Run Nature Reserve, the most scenic section of the 150-mile Great Allegheny Passage (a rail-trail system), the southern terminus of the 70-mile Laurel Highlands Hiking Trail, Markleysburg and Chalk Hill bogs, and two architectural masterpiece homes by Frank Lloyd Wright (Fallingwater and Kentuck Knob). If that does not suffice, the area in which the town nests is home to 40 recorded pteridophyte taxa (roughly one tenth of the North American total), more than 125 species of shrubs and trees, and quite a few rare and unusual herbaceous seed plants.

The high biodiversity level here results partly from climatic moderation proffered by the protected valleys of Bear Run and the Youghiogheny* River (Yawk-uh-gay-nee) – fondly called “the Yawk.” The species richness of the region also derives from its wide range of habitats – moist riparian banks, shaded woodlands, open fields, and large outcrops of shale, sandstone, and limestone, all sedimentary rocks laid down during the coal ages (particularly the Pennsylvanian period 300 million years ago) when the area was covered by a shallow inland sea. Uplifting of the Appalachians and subsequent down cutting by fast-flowing streams formed the rolling hills scenery of today. Abundant fossils emboss trail rocks along the Yough, including *Sigillaria*, *Lepidodendron*, and other carboniferous era pteridophytes.

Erosion-resistant Pottsville sandstone on the edge of the path to Fallingwater is home to two rare ferns – mountain spleenwort (*Asplenium montanum*) and Appalachian gametophyte (*Vittaria appalachiana*). The latter is an ice age relic, existing on shaded sandstone ledges in the northern Appalachians, but only in the sexual, gametophyte stage. Sporophyte plants, if occasionally produced, apparently do not survive. The gametophytes persist and spread by natural fragmentation and asexual gemma production. One must peer into flat, dark, sandstone crevices with a flashlight and hand lens to see the tangled, green strips of tissue paper-thin plants. At the base of the trail flows the swift water of Bear Run, a tributary of the Yough. Here, in 1936, Frank Lloyd Wright set Fallingwater, a summer place for Pittsburgh’s Kaufmann Department Store founders. The house is



Frank Lloyd Wright's Fallingwater

Photo courtesy of Joan Gottlieb

cantilevered over a natural waterfall in a perfect “integration of man and nature,” as architecture critic Paul Goldberger wrote in the New York Times in 1986. Thanks to timely conservation by the Western Pennsylvania Conservancy and the personal generosity of Edgar Kaufmann, Jr., son of the original owners, Fallingwater, the adjacent Bear Run Reserve, and Ohiopyle State Park are open to the public – priceless treasures.

The forest in the Laurel Highlands is an intermingling of Mixed Mesophytic and Hemlock-White Pine-Northern Hardwood types, a response to elevations ranging from 2500’ on Laurel Hill to 1100’ in the Yough River Gorge. At the lower elevations goldie’s fern (*Dryopteris goldiana*), silvery glade (*Deparia acrostichoides*) and glade (*Homalosorus* [*Diplazium*] *pyncocarpon*) ferns can be found near the Great Gorge Trail. *Botrychium virginianum* and both forms of *B. dissectum* literally line the sides of the Allegheny Passage hike/bike trail heading north from Ohiopyle. *B. matricariifolium* is an occasional early season treat here as well. The Laurel Highlands Trail (access from State Route 381 at Ohiopyle) goes to several outstanding overlooks and, after the two mile marker, offers nice populations of blunt-lobed cliff fern (*Woodsia obtusa*), ebony spleenwort (*A. platyneuron*), and walking fern (*Asplenium* [*Camptosorus*] *rhizophyllum*), the latter on limestone outcrops visible to the south of the trail toward the river. Ferncliff and the falls area in Ohiopyle State Park are rocky sites for the fertile spleenwort hybrid *Asplenium pinnatifidum* (*A. montanum* x *rhizophyllum*) and its sterile backcross with *A. montanum* – *A. x trudellii*. All the necessary, promiscuous participants are found in the area and aspleniums will be aspleniums, after all.

Canopy species of the mixed forest include dominant oaks (black, red, scarlet, white, and chestnut), maples (red and sugar), hickory (shagbark and pignut) tulip poplar, beech, slippery elm, basswood, sour gum, and black locust – an incredible color kaleidoscope in the fall. The large trees are so valued that Wright designed Fallingwater so that the house would not interfere with a large white oak at the upper (bedroom) level. Understory trees, particularly in shady ravines, include striped maple, cucumber tree (*Magnolia acuminata*), sassafras, witch-hazel, hop hornbeam, and flowering dogwood. In addition, the area is home to some interesting southern species whose seeds travel with the north-flowing Yough and settle out as the river makes a long horseshoe curve around Ferncliff Peninsula (a Natural Heritage site). Here umbrella magnolia (*M. tripetala*) is at its northernmost station. Pawpaw (*Asimina triloba*), an eastern North American endemic, is one of only two genera of the tropical custard-apple family (Anonaceae) to have made it into the temperate zone, and there are nice populations of it in the woods around Ohiopyle. Probably the most interesting southern species on Ferncliff Peninsula is oil or buffalo nut (*Pyrularia pubera*) a shrub in the generally tropical sandalwood family (Santalaceae). It is semi-parasitic on the roots of mountain laurel and other woody plants. Alas, despite its poisonous oil, it is a favorite appetizer on the menu of a burgeoning white-tailed deer population.

Other shrubs of the mixed and open forest are rosebay (*Rhododendron maximum*), pinxter azalea, spicebush, wild hydrangea, maple-leaved viburnum, silky dogwood (*Cornus amomum*), *Vaccinium* and many other berries. The northern forest on ridge tops and in cool, moist ravines provides suitable conditions for eastern hemlock, yellow

birch, quaking aspen, and striped and mountain maple. Red-berried elder, large-leaved holly, shadbush, and beaked hazelnut are among the shrubs.

The spring and summer displays of wildflowers in the Ohiopyle area are unexcelled and far too numerous to include here. However, note must be taken of painted trillium, Canada mayflower, trailing arbutus, Canadian burnet, wild sarsaparilla, and at least seven orchids (common ladies-tresses, pink lady's-slipper, yellow-fringed and round-leaved *Platanthera*, green adder's mouth, autumn coralroot, and rose pogonia). Along the sandstone rocky edges of the Yough additional herbaceous treasures include rarities like Barbara's buttons (*Marshallia grandiflora*), Carolina tassel-rue (*Trautvetteria caroliniensis*), swamp candles (*Lysimachia terrestris*), and water willow (*Justicia americana*). This is also a good place to see cardinal flower (*Lobelia cardinalis*), buttonbush (*Cephalanthus occidentalis*), and large stands of royal fern (*Osmunda regalis* var. *spectabilis*), including gametophytes and all sporeling stages. Nearly all of western Pennsylvania's more common spring wildflowers can be found in riotous abundance along the Peninsula Trail in Bear Run Nature Reserve.

Fallingwater and the Ohiopyle area are true botanical and recreational treasures, unique and beautiful. Southwestern Pennsylvania is fortunate to call them its own and to be charged with the responsibility for their permanent preservation.

*Youghiogheny is reportedly derived from a native American word "ohiopehla," meaning "white, frothy water."

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PTERIDOPHYTES OF THE OHIOPYLE AREA:

OSP = Ohiopyle State Park BRR = Bear Run Reserve F = Falling
FC = Ferncliff Peninsula

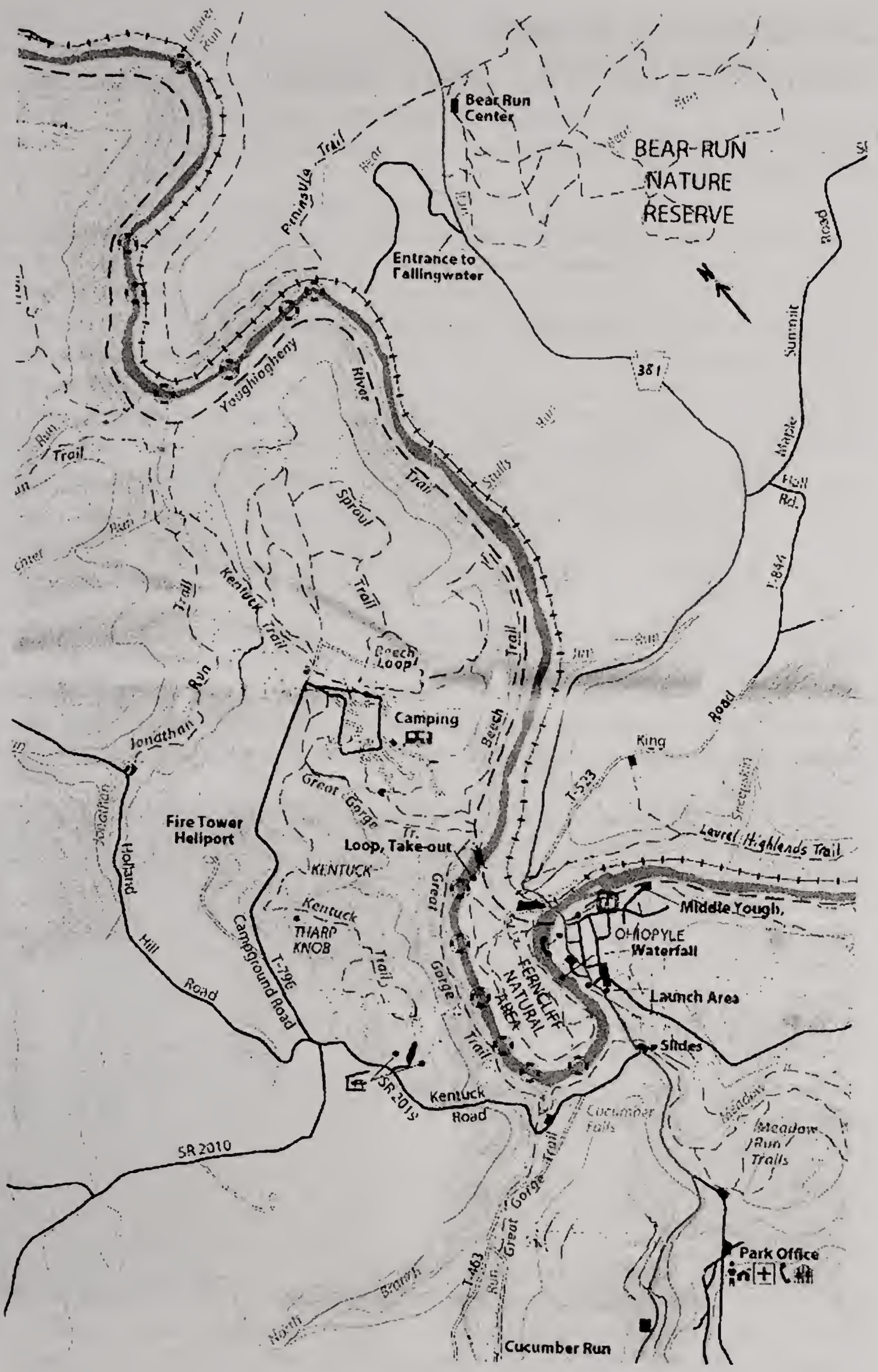
| | |
|--|----------------------------|
| <i>Adiantum pedatum</i> , northern maidenhair | Cucumber Run (OSP) |
| <i>Asplenium montanum</i> , mountain spleenwort | Beech Tr. (OSP); (F) |
| <i>Asplenium pinnatifidum</i> , lobed spleenwort | FC |
| <i>Asplenium platyneuron</i> , ebony spleenwort | Laurel Highlands Tr. (OSP) |
| <i>Asplenium Xtrudellii</i> , Trudell's spleenwort | Falls area (OSP) |
| <i>Asplenium (Camptosorus) rhizophyllum</i> , walking fern MP2 | Laurel Highlands Tr. above |
| <i>Athyrium filix-femina</i> var. <i>angustum</i> , eastern lady fern | Meadow Run Tr. (OSP) |
| Ibid. forma <i>rubellum</i> , red-stiped lady fern | Meadow Run Tr. (OSP) |
| <i>Botrychium dissectum</i> forma <i>dissectum</i> , dissected grapefern | Bike Tr. north from OSP |

| | | |
|---|---|-----------------------------|
| Ibid. | forma <i>obliquum</i> , lobed grapefern | Bike Tr. north from OSP |
| <i>Botrychium matricariifolium</i> , | daisy-leaf moonwort | FC |
| <i>Botrychium virginianum</i> , | rattlesnake fern | Bike Tr. north from OSP |
| <i>Cystopteris protrusa</i> , | fragile fern | Cucumber Run (OSP) |
| <i>Dennstaedtia punctilobula</i> , | hay-scented fern | FC |
| <i>Deparia acrostichoides</i> , | silvery glade fern | Great Gorge Tr. (OSP) |
| <i>Diphasiastrum (Lycopodium) digitatum</i> , | running pine | FC, Peninsula Tr. (BRR) |
| <i>Diphasiastrum tristachyum</i> , | blue ground-cedar | FC |
| <i>Dryopteris carthusiana</i> , | spinulose wood fern | Great Gorge Tr. (OSP) |
| <i>Dryopteris goldiana</i> , | goldie's wood fern | Great Gorge Tr. (OSP) |
| <i>Dryopteris intermedia</i> , | evergreen wood fern | Arbutus Tr., (BRR) |
| <i>Dryopteris marginalis</i> , | marginal wood fern | FC |
| <i>Homalosorus (Diplazium) pycnocarpon</i> , | glade fern | Great Gorge Tr. (OSP) |
| <i>Equisetum arvense</i> , | field horsetail | Bike Tr. north from OSP |
| <i>Huperzia lucidula</i> , | shining fir-moss | FC |
| <i>Lycopodiella inundata</i> , | northern bog club-moss | FC |
| <i>Lycopodium clavatum</i> , | common club-moss | Peninsula Tr. (BRR) |
| <i>Lycopodium dendroideum</i> , | prickly tree club-moss | FC |
| <i>Lycopodium obscurum</i> , | flat-branched tree club-moss | FC; Peninsula Tr. (BRR) |
| <i>Matteuccia struthiopteris</i> var. <i>pensylvanica</i> , | ostrich fern | Bike Tr. south from OSP |
| <i>Onoclea sensibilis</i> , | sensitive fern | FC |
| <i>Osmunda claytoniana</i> , | interrupted fern | F; FC |
| <i>Osmunda regalis</i> var. <i>spectabilis</i> , | royal fern | F; Meadow Run (OSP) |
| <i>Osmundastrum cinnamomea</i> , | cinnamon fern | F; FC |
| <i>Phegopteris hexagonoptera</i> , | broad beech fern | Peninsula Tr. (BRR) |
| <i>Polypodium virginianum</i> , | rock polypody | FC |
| <i>Polystichum acrostichoides</i> , | Christmas fern | FC; Beech Tr. (OSP) |
| <i>Pteridium aquilinum</i> , var. <i>latiusculum</i> , | bracken fern | Cucumber Run (OSP) |
| <i>Thelypteris noveboracensis</i> , | New York fern | FC; BRR |
| <i>Thelypteris palustris</i> , | marsh fern | FC |
| <i>Vittaria appalachiana</i> , | Appalachian gametophyte | F |
| <i>Woodsia obtusa</i> , | blunt-lobed cliff fern | Laurel Highlands Tr. at MP2 |

Asplenium montanum
on Pottsville sandstone.

Photo courtesy of Joan Gottlieb





Cheilanthes lindheimeri

Lindheimer's lip fern ~ fairy swords

James Horrocks
Salt Lake City, UT

Named for Ferdinand Lindheimer, a plant collector in Texas, this charming little fern would be perfect in an outdoor model railroad layout. It is also called fairy swords, which is an apt description for this upright grower. Native to northern Mexico and the southwestern United States (Texas, New Mexico, and Arizona), fairy swords are epipetric, colonizing mostly igneous rocks but also found along the damp edges of granite, sandstone, and terrestrial among boulders on talus slopes. Considered one of the most striking of the xeric ferns, it is frequently encountered in its native habitat, but rarely cultivated. At the University of California at Berkeley, it is grown in the Botanical Garden and a beautiful color photograph of it can be found in Sue Olsen's splendid "Encyclopedia of Garden Ferns", depicting its upright growth. This species could be mistaken for certain other cheilanthines that have the same vertical habit. Fairy swords are considered semi-evergreen and hardy in Zones 7 through 9.

Description: The rhizome is long-creeping, producing scattered fronds with dark reddish-brown to purplish black stipes. The stipes, half the length of the frond, are covered with lanceolate concolorous or at times bicolorous scales, pale reddish-brown with an occasional central dark brown stripe. The scales exhibit long curly hairs, most abundant near the base. The tripinnate, pale-blue fronds are eight to fourteen inches long with ten to fifteen pairs of pinnae, thickly covered with white curly hairs on the upper surface. The lower surface displays an abundance of rust-colored hairs. The bead-like segments are strongly under rolled to produce a continuous false indusium along the margin, covering the sori. As are many desert ferns, and particularly in the genus *Cheilanthines*, this species is apogamous.

Culture: Charming would be the word for this upright fuzzy grower. Fairy swords will grow in desert gardens among rocks and cobble but it must be sheltered from winter drip. Lellinger lists it as "not cultivated" while Hoshizaki mentions that it is "relatively easy to grow". It does well in pot culture if protected. Being apogamous, it could be grown from spore and if there is a good crop, then experimented with in gardens with a more mild climate. It should be given a site similar to its natural habitat.



Cheilanthines lindheimeri
at Berkeley Botanical Garden

Photo courtesy of Sue Olsen

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Encyclopedia of Garden Ferns, (2007) Sue Olsen, Timber Press, Inc. Portland

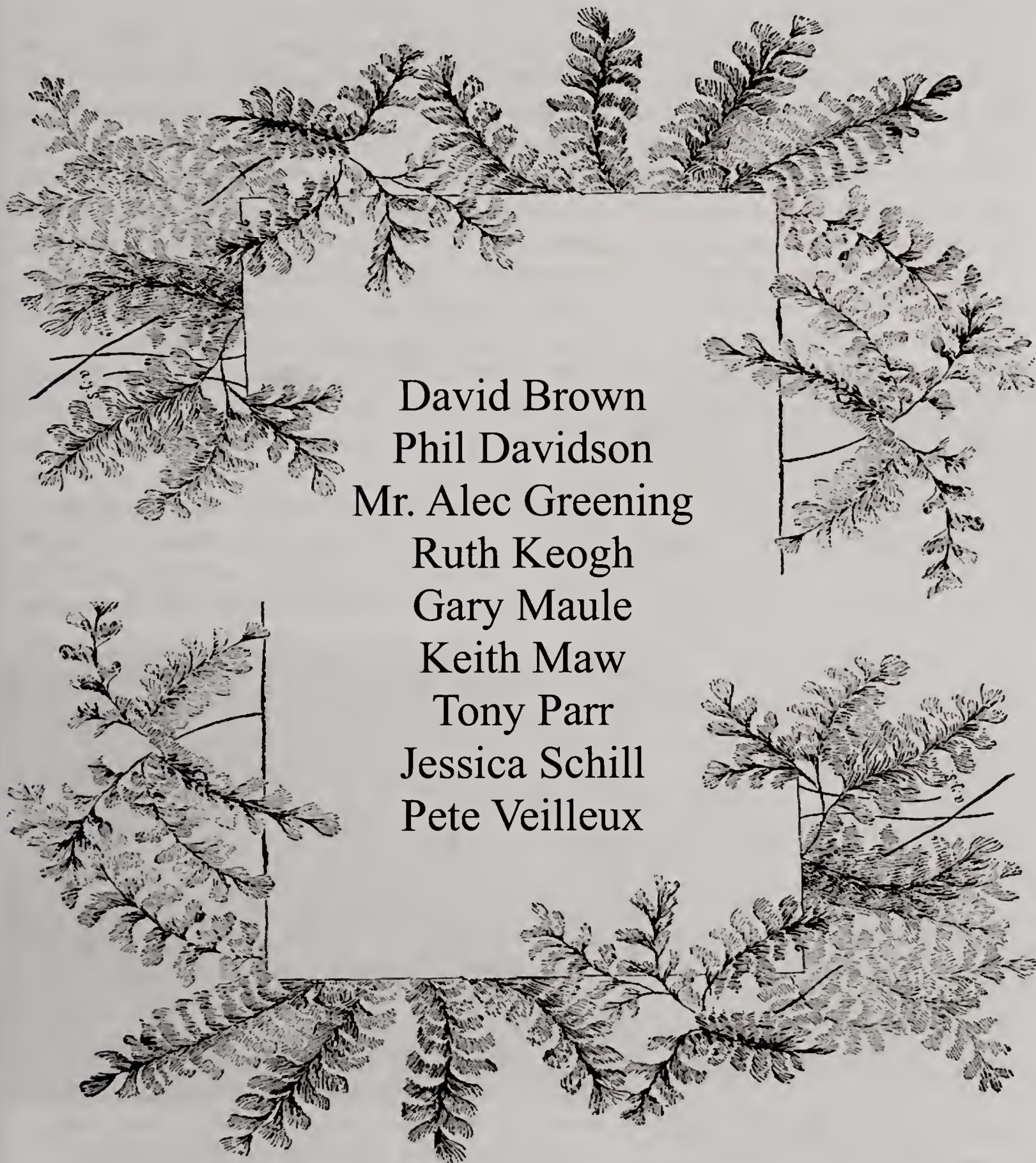
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Fern Grower's Manual, (Revised - 2001) Barbara Joe Hoshizaki and Robbin C. Moran,
Timber Press, Portland

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Macmillan Publishing Co., New York

Welcome New Members!



David Brown
Phil Davidson
Mr. Alec Greening
Ruth Keogh
Gary Maule
Keith Maw
Tony Parr
Jessica Schill
Pete Veilleux

Fern Discovery Hikes at Mount Baker and Yellow Aster Butte Trail - Day One

Carolyn Doherty
Puyallup, WA

In early September of 2009 a small group of Hardy Fern Foundation members took a discovery trip to the North Cascades of Washington State. We were headed for the Mount Baker area about 60 miles east of Bellingham, Washington .

Our long awaited fern-seeking adventure began Friday, September 11, 2009, on one of the most beautiful weekends of the summer. The six hardy souls—Michelle Bundy, HFF Curator; Richie Steffen, Curator of the Elisabeth Miller Garden and Past President of the HFF; Don Naylor, amateur enthusiast from Illinois; Jerry and Carolyn Doherty, HFF volunteers; and Tim McNitt, trained naturalist and very able leader, met at a very nice, comfortable lodge “The Logs” which the group had rented outside the tiny hamlet of Glacier 30 miles east of Bellingham, WA in the Cascade foothills of Whatcom County. We quickly unloaded all the food Michelle had brought and started pouring over the wealth of books, maps, charts, and other materials Tim had provided to educate ourselves about what we would be seeing on our hikes over the next two days.

After a wonderful dinner at Graham’s Restaurant/Pub in Glacier, we returned to our lodge and finished our preparations for the next day. Due to a bicycle race and road closures east of Glacier, we decided to do our main hike to Yellow Aster Butte on Sunday.

Saturday morning, after feasting on Michelle’s excellent breakfast, we set off up the road to our first stop at Picture Lake (photo pg. 14). It is perfectly named due to the beautiful reflections of Mt. Shuksan on its surface and the colorful vegetation surrounding it including all the wild blueberries one could possibly eat. We walked around the lake observing the view and vegetation which included some interesting lycopodiums and enjoyed tasting the blueberries.

We then set off again driving further up the Mt. Baker Highway to Heather Meadows above the ski slopes where we embarked on another hike down and around one of the Bagley Lakes. Here we took our time to identify several ferns including the mountain fern, *Thelypteris quelpaertensis*, and two parsley ferns, *Cryptogramma cascaden-sis*, and also the more commonly



From left to right - Richie Steffen, Don Naylor, Jerry Doherty, Carolyn Doherty, Tim McNitt and Michelle Bundy

known *Cryptogramma acrostichoides* which can be distinguished from the former by the way it retains its “skirt” of old dried foliage. We also enjoyed trying to identify many other plants including sitka valerian, paintbrush, a saxifrage, both white and pink mountain heathers, and pink monkey flower, and *Mimulus lewisii*. Especially interesting were the insect-eating butterworts, *Pinguicula vulgaris*, growing on a seeping rock wall and the stalks of the spent native orchids.

After sliding down a snowbank (garbage bags work really well) and returning to the parking lot where the weather was really getting warm, we rested in the shade and ate our box lunches. We then piled back into the cars for the 3-mile drive higher up the highway to its terminus at Artist Point where the views were even more spectacular.

Setting off from there on what Tim called “a short hike,” we climbed up, up, and up to the top of Table Mountain. It was a strenuous, hot hike on rock rubble-lined switchbacks, but each time we stopped to catch our breath, the views got better and better. Tim explained that a volcano existed here long ago. We could see evidence of ash layers from multiple eruptions. We could also see the unbelievable erosion of the softer rocks and deposits leaving only the hardest materials to survive today. When we finally reached the top after a scramble up a rocky slope, we had a long rest while enjoying the views. We learned from Tim that this “top” used to be the bottom of a valley with steep walls soaring above it. There remains today only vague evidence of that long-gone volcano around us. Our minds had difficulty comprehending how it had been eons ago.

Sitting up there in the perfect weather between Mt. Baker (elev. 10,785 ft.) and Mt. Shuksan (elev. 9,127 ft.) in all their glacier-clad glory made that very rigorous one mile climb worth all the effort even though we knew that going back down would also be challenging.

Returning to our lodging after the steep, but rather quick downhill and the beautiful drive down the mountain, we only had time to quickly refresh before dinner at an excellent Italian restaurant in Glacier.

After dinner Tim explained the significance the geology plays in the ferns that grow at Yellow Aster Butte, including serpentine soil areas and gneiss. We also studied about moonworts, botrychiums, which would be one of the highlights of tomorrow’s hike.



Botrychium minganense

Photo courtesy of Timothy McNitt

Ferns of Yellow Aster Butte continued ~ Day 2

Jerry Doherty
Puyallup, WA

The next day the group of pteridophiles had our main adventure ahead of us. 30+ species of ferns and allies were waiting for us in the Yellow Aster Butte area of the North Cascades in Washington State close to the US and Canadian border at the 49 degree parallel. Incidentally, there are subalpine flowers that are yellow like daisies and there are flowers that are asters but no yellow alpine asters. Yellow aster is a misnomer.

We left "Log Lodge" at 7:00 am in order to beat the Mount Baker Highway (State 542) road closure. (Bike races today till noon). At 8:15 am five of us were eager to start at the Yellow Aster Butte trailhead. (3600 ft. elevation.) The group continued under the leadership of naturalist Tim McNitt and proceeded up the steep switchback trail through beautiful old growth forest with patches of green mosses hanging from logs, trees and rocks, as well as emerald blankets of moss on the ground. (How many different shades of green are there?) The other part of the switchback was a trail through a brushy old avalanche chute fully exposed to the hot sun. The sky was a pristine blue all day and the temperature was above 70 degrees most of the day.

After a mile of solid trail climbing, the path leveled off into a bronzed colored blueberry filled meadow. We caught our breaths and ate some blueberries which were deliciously sweet and then proceeded onto a less steep trail to the serpentine rock and gneiss rock areas. Incidentally, gneiss is pronounced nice.

On the way the group saw subalpine wildflowers. Some still had flowers while others had only seeds. Most were dried and spent. My favorite was the pasqueflower (*Anemone occidentalis*) with its beautiful cotton ball looking seed head. Our party also saw lupines (*Lupinus latifolius*), mountain heather (*Phyllodoce empetrifomis*), huckleberry, and the pretty little penstemon (*Penstemon procerus*), as well as several other species.

At the split in the trail (elevation 5150 ft.) we took the left trail up the hillside to our first stop containing unique plants. At this location some ferns were rooted in what appeared to be solid rock. They had really squeezed into cracks in the rock which help to protect their roots from the freezing winter weather.

Richie took some photos of these ferns growing from the fissures in the rock. That day Richie took several photos with his tripod setup while this writer used my cell phone camera between calls from home and no reception.

After a little walk we reached our final destination below Yellow Aster Butte. It was a big flat open area the size of a small park but with very few trees and no grass- just small subalpine plants. The area had big bus-size boulders and a small almost dried up lake. Some rocks were gneissic and others were serpentine. Tim, our geological expert, explained that serpentine rocks can contain many minerals, such as, magnesium, iron, magnesium, chromium, and nickel which most plants cannot tolerate. He went on to point out that many of the ferns we would see today are able to absorb some of these minerals and not harm themselves. In fact, as I understand it, these ferns have adapted and they are chemically dependent on the serpentine rocks and will only grow in the serpentine areas. A good example of this is the *Adiantum aleuticum* (serpentine ecotype) which is slightly different from the *Adiantum aleuticum* we had seen the day before in the other locations. Each of us used a 20x power hand lens to observe the

difference in the pinna. These ferns are nearly impossible to cultivate outside their environment

Another group of ferns was, according to Tim, quite unique. He pointed out an area on the serpentine boulder about 20 feet wide where one parent (*Polystichum lemmonii*), (photo p.14), was close to another parent (*Polystichum lonchitis*) and the offspring (*Polystichum kruckebergii*), (photo p.15), was between them. There were many other unique plants among the boulders. Tim took the little group of fern lovers around the area. A number of ferns were rooted in the splits and cracks of the rocks. Other plants, such as the green spleenwort (*Asplenium trichomanes-ramosum*), were rooted by themselves in lonely looking spots in the boulders several feet away from the next fern. We were able to climb among the rocks to get closer looks and take pictures. Tim led us around to see other unusual and quite unique plants. My favorite was the Indian's dream (*Aspidotis densa*). No one seems to know why it has this common name.

After awhile our leader pointed out it was getting late for two of us who had to leave early for a family surprise birthday party for Don (oops, who told?), and the choice was either eat lunch or look for the elusive *Botrychium* (moonwort) plants in the small field. This writer usually doesn't skip lunch too often but this time the decision was a no brainer. After spending an hour studying one of Tim's books on moonworts the previous evening, I was ready to see real plants in nature. Luckily, Tim was with us or we would never have discovered any of the elusive plants. He showed us a spot in the small subalpine plants where he had eaten his lunch several times over the last two years before discovering a moonwort right at his feet. We were able to see several moonworts that we photographed by getting down on our hands and knees and putting a penny near the plant to give the perspective of size. These moonworts have been seen in this area: *Botrychium lanceolatum* var. *lanceolatum* (triangle moonwort); *Botrychium multifidum* (leathery grape-fern); *Botrychium pinnatum* (northern moonwort); *Botrychium simplex* var. *complanatum* (least moonwort).

It was time for two of us to go home. It took us an hour and a half to reach the parking lot with the thrill of victory and the agony of the feet and knees.

All in all we had a wonderful adventure. We had excellent weather, excellent fellowship, excellent knowledge of the plants, excellent planning and leadership, and finally spectacular views of Mt. Baker and Mt. Shuksan and their surroundings.

Other ferns and lycophytes that have been seen on this hike are *Asplenium trichomanes* ssp. *quadrivalens*; *Athyrium alpestre* var. *americanum*; *Athyrium filix-femina* ssp. *cyclosorum*; *Blechnum spicant*; *Cryptogramma acrostichoides*; *Cystopteris fragilis*; *Diphasiastrum complanatum*; *Diphasiastrum sitchensis*; *Dryopteris expansa*; *Dryopteris filix-mas*; *Equisetum arvense*; *Equisetum telmateia* ssp. *braunii*; *Huperzia haleakalae* *Gymnocarpium*



Polypodium amorphum Photo courtesy of Michelle Bundy

disjunctum; *Lycopodium annotinum*; *Lycopodium clavatum*; *Polypodium amorphum*; *Polypodium glycyrrhiza*; *Polystichum lemmonii* x *munitum*; *Polystichum munitum*; *Pteridium aquilinum* var. *pubescens*; and *Selaginella wallacei*.



Picture Lake
Mt. Baker, Washington

Photo courtesy of
Michelle Bundy

Ballinger Garden (below)
Photo courtesy of Sue Olsen



Aleuritopteris
tamburii
(above)

Photo courtesy of
George Yatskievych



Polystichum
lemmonii

Photo courtesy of
Richie Steffen





Cryptogramma cascadensis

Photo courtesy of
Richie Steffen



Pellaea mucronata

Photo courtesy of Sue Olsen



Polystichum kruckebergii
(above)

Photo courtesy of
Richie Steffen



Aleuritopteris hybrid

Photo courtesy of Lisa Hooper

Hardy Fern Foundation Spore Exchange List 2010

To Order: Please print your selections in alphabetical order. Include 50 cents for each fern requested, postage (Check made payable to Hardy Fern Foundation) and a self addressed bubble envelope (please do not attach the postage to the envelope). If you are ordering more than a half dozen packages, please send additional postage up to one dollar's worth. There are no additional charges applied to overseas members, but please enclose an international postage coupon (2 for large orders) and an envelope. Please list a first and second choice. Some items are limited, so order early for best selection. If choices are unavailable, would you like to donate the money to the foundation, or hold it for another order? If neither is indicated, we will consider it a donation to our endowment fund. At this time orders are not taken from the internet, so please follow instructions above. Orders will be sent within a month of post mark date.

Your fresh spores are always appreciated!!! We are trying to restock our inventory this year, so please consider collecting spore and donating it to the exchange. (Please package with collector's last name and year collected on package - individually packaged spore is much appreciated)

Mail requests to:

Katie Burki

HFF Spore Director

501 South 54th Street

Tacoma, WA 98408

| <u>Genus species</u> | <u>var. or cv.</u> | <u>Year</u> | <u>Donor(s)</u> |
|--------------------------------|------------------------|-------------|-----------------|
| <i>Adiantum aleuticum</i> | 'Subpumilum' | '07, '09 | Olsen, RSF |
| <i>Adiantum poiretii</i> | | '09 | Olsen |
| <i>Athyrium filix-femina</i> | | '07 | Peachy |
| <i>Athyrium niponicum</i> | 'Pictum' | '07 | Olsen |
| <i>Blechnum appendiculatum</i> | | '09 | Olsen |
| <i>Blechnum chilense</i> | 'Red Form' | '08 | RSF |
| <i>Blechnum niponicum</i> | | '09 | RSF |
| <i>Blechnum spicant</i> | | '08 | Weesjes |
| <i>Cyrtomium caryotideum</i> | | '08 | Weesjes |
| <i>Cyrtomium fortunei</i> | 'Clivicola' | '08 | Weesjes |
| <i>Cyrtomium macrophyllum</i> | var. <i>tukusicola</i> | '08 | RSF |
| <i>Doodia media</i> | | '08 | Weesjes |
| <i>Dryopteris arguta</i> | | '07 | RSF |
| <i>Dryopteris cordata</i> | | '07 | Wolfram |
| <i>Dryopteris decipiens</i> | | '07, '09 | Olsen, RSF |
| <i>Dryopteris dilatata</i> | 'Jimmy Dyce' | '08 | Weesjes |
| <i>Dryopteris erythrosora</i> | | '08 | Weesjes |
| <i>Dryopteris filix-mas</i> | | '07 | Peachy |
| <i>Dryopteris filix-mas</i> | 'Crispatissima' | '08 | Weesjes |
| <i>Dryopteris formosana</i> | | '08, '03 | Weesjes, RSF |

| Genus species | var. or cv. | Year | Donor(s) |
|--|--------------------|---------------|--------------------------|
| <i>Dryopteris lepidopoda</i> | | '05, '07, '08 | RSF, Olsen, Weesjes |
| <i>Dryopteris ludoviciana</i> | | '02, '03, '06 | RSF, Hay- |
| <i>Dryopteris marginalis</i> | | '03, '08 | Weesjes, Hay, Briegel |
| <i>Dryopteris namegatae</i> | | '05, '09 | Olsen, RSF |
| <i>Dryopteris polyblepharum</i> | | '08 | Weesjes |
| <i>Dryopteris pycnopteroides</i> | | '03, 04 | RSF, Gassner |
| <i>Dryopteris remota</i> | | '00 | RSF |
| <i>Dryopteris scottii</i> | | '03 | RSF |
| <i>Dryopteris sieboldii</i> | | '01, '05, '08 | Hill, Weesjes |
| <i>Dryopteris spinulosa</i> | | '03 | Briegel |
| <i>Dryopteris sublacera</i> | | '05, '04, '09 | RSF, Gassner, Olsen |
| <i>Humata pectinata</i> | | '07 | Wolfram |
| <i>Llavea cordifolia</i> | | '03 | Swartz |
| <i>Lygodium scandens</i> | | '03 | Briegel |
| <i>Matteuccia struthiopteris</i> | | '03 | Briegel |
| <i>Onoclea sensibilis</i> | | '03 | Briegel |
| <i>Pellaea cordifolia</i> | | '00 | Swartz |
| <i>Phyllitis scolopendrium</i> var. <i>americana</i> | | '07 | Cady's Falls Nursery |
| <i>Phyllitis scolopendrium</i> | | '01 | RSF |
| <i>Polypodium glycyrrhiza</i> | | '03 | RSF |
| <i>Polypodium interjectum</i> | | '09 | RSF |
| <i>Polypodium polypodioides</i> | | '03 | Briegel |
| <i>Polypodium scouleri</i> | | '01 | RSF |
| <i>Polystichum acrostichoides</i> | | '03 | Briegel |
| <i>Polystichum aculeatum</i> | | '04, '05 | RSF, Gassner |
| <i>Polystichum braunii</i> | | '07 | Peachy |
| <i>Polystichum californicum</i> | | '05 | RSF |
| <i>Polystichum dracomontae</i> | | '09 | Olsen |
| <i>Polystichum imbricans</i> | | '07 | RSF |
| <i>Polystichum makinoi</i> | | '05, '08 | Weesjes, RSF |
| <i>Polystichum neolobatum</i> | | '08 | Weesjes |
| <i>Polystichum piceopaleaceum</i> | | '06 | RSF |
| <i>Polystichum retrosopaleaceum</i> | | '04, '06 | Gassner, RSF |
| <i>Polystichum tsus-simense</i> | | '03, '05 | Duryee, Hill |
| <i>Polystichum xiphophyllum</i> | | '05, '08, '09 | Duryee, Weesjes, RSF |
| <i>Pteris vittata</i> | | '03 | Briegel |
| <i>Thelypteris palustris</i> | | '03 | Briegel |
| <i>Woodsia intermedia</i> | | '05 | RSF |
| <i>Woodsia polystichoides</i> | | '09 | RSF |
| <i>Woodwardia areolata</i> | | '03 | Briegel |
| <i>Woodwardia fimbriata</i> | | '02 | Mandeville |

| Donors | From |
|---------------------------------------|------------------|
| Kevin Briegel | Ohio |
| Imre Burka | Hungary |
| Cady's Falls Nursery | Vermont |
| Sylvia Duryee | Washington |
| Wolfram Gassner | Germany |
| Terry Hay | Alabama |
| Arlen Hill | Washington |
| Jocelyn Horder | Washington |
| Wilfried Limberger | Austria |
| Sue Mandeville | Oregon |
| Peggy McGill | Alabama |
| Sue Olsen | Washington |
| Harold Peachy | New York |
| Rhododendron Species Foundation (RSF) | Washington |
| David Schwartz | California |
| Amy Schmidt | Wisconsin |
| Jeanie Taylor | Washington |
| Evelyn Weesjes | British Columbia |
| Christian Wingard | Louisiana |
| Charles Wolfram | Virginia |

2009 California Ferning Report

Introduction

Pat Acock

30 September

From about 2pm onwards people started to arrive from various American states, Canada and the UK for the HFF and BPS California tour. We were hosted by Sue Olsen, Dan Yansura and his wife Patricia Tanttilla in an apartment the hotel had allowed Sue for that day only. Here we were introduced to those new to these tours and met up with old friends from around the world to enjoy a cheese and wine reception. At the reception we were given individualised books, prepared by Dan and Patricia, containing our notes, routes, tickets, maps, fern-guides and instructions so that we could come prepared to enjoy each day to the full. We then went to dinner and those who had travelled far took the opportunity of an early night.

1 October

Alan Ogden

We gathered at 8 am, as instructed, in the lobby of the Best Western Lighthouse Hotel, Pacifica in various states of temporal disorientation but in good humour and ready for the day's adventures. We made our first acquaintance with the large and comfortable coach and its cheerful driver Danny for the short journey to the home of Dan Yansura and Patricia Tanttilla who had invited us for breakfast.

An inviting spread was laid out for us in the garden with some trays of frittata, Italian omelets, and other goodies and lots of welcome tea and coffee. In the provided folder was a list of ferns that Dan had prepared for us, 93 different species and varieties in the greenhouse and 103 outside in the garden! It was a bit overwhelming and a wonderful achievement in this very dry part of the country. The garden was on a sloping site with the conservatory tucked in behind the house and the plants outside in terraced beds. There were many other plants apart from ferns and a delightful jungle experience was created with many mature tree ferns. I was impressed by the large banana coloured slugs which Dan assured us only ate decaying plant material and the odd *Asplenium*. I particularly liked the *Drynaria* in hanging baskets, the *Lygodium* climbing from floor to roof of the greenhouse and the *Phlebodium pseudo-aureum* with huge furry rhizomes. I was impressed by the *Ophioglossum pendulum* which looked very happy hanging from its suspended containers.

We were supposed to leave at 10am but it was half-past when we boarded the bus to go to the Golden Gate Park, traveling along the coastal road where acres of Hottentot fig, *Carpobrotus edulis*, had carpeted the land on both sides of the road. San Francisco is built on a peninsula and the large park traverses half of the northern part. We entered the Strybing Arboretum by a path beside a lake bounded by an avenue of huge *Dicksonia antarctica* and beneath a luxuriant growth of *Hypolepis* and *Athyrium filix-femina*. This was maintained by an automatic watering system as was the tree fern dell which was our next stop. Here were more than a hundred tree ferns, mostly *Dicksonia antarctica* but also *Cyathea cooperi* and *D. squarrosa* growing in a boggy area which was wet enough to support *Gunnera* and *Woodwardia fimbriata* beneath the trees.

Next we came to the Conservatory of Flowers which was reminiscent of the glasshouse at Kew but this one was American, possibly designed in New York but built of California redwood in 1878. This beautiful large structure was divided into ecological sections and stuffed with plants including many ferns and orchids.

After lunch we had a tour of the Strybing Arboretum led by Don Mahoney. We were joined by an ex-member of our Society, Philip Hammond, who was known to many of us. Don explained that they are beginning a collection of tree ferns and produce enough *Cyathea medullaris* to supply other gardens there being no commercial source. He was assisted by a volunteer, Nani Fitzpatrick, a striking young lady from Hawaii, who grows many ferns from spores. The garden, like the glasshouse, is divided into ecological zones – cloud forest, primitive plants with a stream and boardwalk and a desert area. Many plants were suffering from the drought but the desert ferns looked very happy.

A redwood grove completed our tour and *Polystichum munitum* with occasional *Dryopteris expansa* was growing well beneath them as it does in the wild. It was interesting to see that redwoods, unlike most conifers, can sprout from the roots when felled, forming a circle of new trees. We ended up at the propagation houses where there was a wonderful range of healthy plants for the arboretum and for sale. There was a section for ferns, mostly grown by Nani who told us she uses several methods, spores, tissue culture plugs and divisions etc.

Several people bought ferns despite the daunting prospect of coping with them for the rest of the tour and we even managed to scrounge a cup of tea! Martin formally thanked the staff who had given us an excellent tour and they responded by giving the less mobile of us a ride back to the gate on the electric buggy.

Back on the bus we journeyed back to Pacifica where we had a 'Welcome dinner' at the High Tide Restaurant.

2 October

Martin Rickard

Another day looking at local gardens, but what gardens! The first was a very small private garden created by Tom and Jeong Ballinger neither of whom unfortunately could be there on the day of our visit. In retrospect, I guess the garden might only be 45 by 30 feet but it was literally packed with treasures.

The front garden was fairly hot and dry but the vast majority of the ferns were in the green oasis that is the back garden. Here ferns were planted under various broad leaved trees and several palms. One or two tree ferns also helped provide a canopy e.g. *Dicksonia antarctica*, *Cyathea cooperi* and *Cyathea tomentosissima* - although we have been told that DNA sequences show *C. tomentosissima* and *C. cooperi* are the same species! Other untrunked specimens of tree ferns included *Dicksonia blumei* and *Sadleria cyatheoides*. In the more open areas several xeric species flourished, e.g. *Pellaea andromedifolia*, *P. calomelanos*, *P. breweri*, *Cheilanthes lendigera*, *C. eckloniana* - which is one of my favourites, *C. grisea*, *Astrolepis sinuata* and no doubt others I did not note. Other species rarely if ever seen in the UK were: *Polypodium squamatum* and *P. bombycinum* both with silvery hairs: *Arachniodes aristata* 'Okoze', a beautiful dwarf congested form, *Anemia tomentosa*, *Coniogramma gracilis* - with narrower leaf divisions than the more familiar *C. japonica* and *Blechnum falciforme* with elegant pink young arching fronds. Slightly more familiar were the beautiful hybrid maidenhair *Adiantum x tracyi*, *Osmunda banksifolia* and *Dryopteris formosana*. *Pyrrosia* seems to be a popular genus in the US and here was no exception with several cultivars of *P. lingua*, including 'Monsterifera' and 'Cristata'.

Apart from ferns and other open ground plants I must mention that there was a large collection of epiphytic orchids all grown in pots and cultivated in a small shade area. Although this is a very interesting fern **collection**, it is also a wonderful fern **garden**. It was a delight to see ferns beautifully grown, well-labeled **and** attractively landscaped in a small but perfect setting.

This garden was always going to be a hard act to follow but Dan and Sue were inspired in making the University of California Berkeley Botanical Garden our next stop. With the resources of the university behind it and a large space to plant it holds one of the best collections of ferns I have seen for some time.

We were extremely pleased and fortunate to have Alan Smith to guide us around. Alan recently retired from the university staff although he still works in a voluntary capacity in the herbarium. He was ably assisted by the various staff members responsible for the different garden areas, notably Chris Carmichael, Elaine Sedlack and Peter Clement. The tour started by admiring the collection of large specimen xerics including

Cheilanthes notholaenoides, *Pellaea mucronata*, *Notholaena candida*, *Cheilanthes fendleri*, *C. distans* and *C. wootonii*. Nearby we all poured into a small heated fern house where a wide range of well grown non-hardy ferns were on display. I loved the *Cibotium* sp., *Cyathea mexicana*, *C. poeppigii*, *Pronephrium simplex* - it is not often I find anything in the *Thelypteridaceae* attractive, - the beautiful silvery fronded *Polypodium rosea* and *Deparia lancea*. Once more out into the open we explored areas of the garden covering different parts of the world. We started with California and we were pleased to make early acquaintance with some natives, notably *Polystichum californicum*, *Polypodium glycyrrhiza*, *P. calirhiza*, *P. californicum*, *Aspidotis densa*, *A. carlotta-halliae* and *Polystichum imbricans*.

Moving on we explored Central America where *Dicksonia sellowiana* attracted my attention, it did **look** different from *D. antarctica*. We also saw *Polypodium guttatum*, *Arachniodes denticulata*, which we saw last year in Costa Rica and untrunked plants of *Blechnum schiedianum*, Central American *Asplenium scolopendrium* - looking exactly like our European form despite the discrepancy in chromosome numbers, as well as many more Central American species. These gardens have such wonderful fern collections it is impossible to do them justice in the space available here but I will mention a few more interesting plants well established and obviously happy here near San Francisco: *Llavea cordifolia* with its curious dimorphic fronds, *Dryopteris decipiens* with attractive pink young fronds, *Pentarhizidium orientalis* (*Matteuccia orientalis*), *Angiopteris lygodifolia* and *Microlepia platyphylla* which Judith Jones in Seattle, later assured me was more or less hardy?

Later Alan Smith arranged to meet us in the Jepson herbarium. Several interesting specimens were pulled out but we did not have enough time to investigate the collection as fully as we would have liked. Alan gave us an introductory talk and touched on the 'hot' subject of DNA sequences! Apparently some species and genera formerly thought to be distinct or similar have now been reassigned in the overall classification - running completely against morphological evidence! Interesting times! Alan has written a full article on this which was published in 2006 in *Taxon* 55(3). I feel it would be very useful if this article could be made more widely available to pteridologists or perhaps be reprinted in a fern journal somewhere.

The day wound up with a fish supper nearby before rushing back to Pacifica to see the sun set over the Pacific. Needless to say we were running late and missed the sunset completely!



To be continued...

Conservatory of Flowers

Pat Acock (left) and Tom Stuart

Photo courtesy of Sue Olsen

Hardy Fern Foundation

Index of Articles Update---2009

Jerry Hudgens
 Fern Dell
 Churchville, Maryland

The Winter 2009 issue of the Hardy Fern Foundation (HFF) Quarterly (Vol. 19, No. 1) contained a prepared index of all articles published by the HFF over its first 19 years. The index below updates the index to include articles published in 2009.

The Index of Articles and an Index of Ferns mentioned in those articles, both in searchable forms, can be accessed on the HFF website (www.hardyferns.org). The two indexes, which will soon be updated on the website, can be used together to allow interested users to find information about particular ferns in articles published by the HFF. To obtain back issues contact Sue Olsen. foliageg@juno.com

| Ref | Vol(No) Pg | Year | Authors | Title |
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| 606 | 19(1)28 | 2009 | | Announcement: Summer Fern Course in Maine [by Robbin Moran] |
| 607 | 19(2)30 | 2009 | Steffen, Richie | President's Message Spring 2009 |
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| 609 | 19(2)31 | 2009 | Black, Lyman | How You Might Get Started with Ferns |
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| 618 | 19(2)64 | 2009 | Schenk, George | A Fern Table, Pro and Con |
| 619 | 19(2)66 | 2009 | | Welcome New Members |
| 620 | 19(2)67 | 2009 | HFF Newsletter 7(2) & Rickard, Martin | How to Provide Winter Care for Tree Ferns |
| 621 | 19(2)69 | 2009 | Steffen, Richie | Container Gardening with Ferns |
| 622 | 19(2)73 | 2009 | Avery, Don | Growing Lime-Loving Ferns in Tufa in Vermont |
| 623 | 19(3)All | 2009 | Laskowski, Jo, Olsen, Sue & Peterson, Rick | SPECIAL EDITION: Directory of Fern Gardens, Nurseries, and Preserves in the United States and Canada |
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A Sad Tale

Tom Stuart
Croton Falls, NY
tstuart@westnet.com

Once upon a time botanical gardens used to champion horticulture and botany. In recent years the circus has come to town. As I write in October, some upcoming events are:

Los Angeles County Arboretum & Botanic Garden: Goblins in the Garden

Fairchild Tropical Botanic Garden: Scarecrow Contest

Callaway Gardens: The Steeplechase

Chicago Botanic Garden: Spooky Pooch Parade

Brooklyn Botanic Garden: Ghouls and Gourds

New York Botanical Garden: Halloween Parade and Bats!

Cleveland Botanical Garden: BOO-tanical Bash

Morris Arboretum: Garden Railway

What all of these events have in common is an utter lack of pertinence to science, to plants. Their purpose is entertainment. They are the Fox news of the educational world. Just in case you're thinking this must be a North American syndrome, it takes no effort at all to discover RBG Kew's Treetop Walkway, 18 meters up, more properly called the Xstrata Treetop Walkway. What is Xstrata? See xstrata.com.

How refreshing was a visit earlier this month to the University of California Botanical Garden at Berkeley. No ghouls, no railway, no goblins, no parades. Just plants, thrilling, well-grown plants, well-labeled plants. Despite California's woes, this place is still a treasured educational resource. The lucky people who live near Berkeley: do they know what they have?

To the point. The most amazing thing about this botanical garden from a pteridophile's view is that it gives full recognition to ferns. They are as plentiful in this garden as in the flora it elucidates, and they are spread all over the collections, not stuck off in the usual corner. I suspect pteridologist Alan Smith of the University Herbarium is at least part of the reason.

You can read more about this visit in this issue of the Quarterly or the upcoming Bulletin of the British Pteridological Society, but I do want to make you aware of one need at this premier garden. Chris Carmichael, Associate Director of Collections and Horticulture, says that they'd like to expand the availability of their collection to gardeners. To that end Chris is looking for additional volunteer propagators to work with ferns. If you grow ferns and live near Berkeley, consider volunteering. If you don't live near them, but have a friend who does, make them aware of this opportunity. Details on contacts and volunteering can be found at <http://botanicalgarden.berkeley.edu>.

And next time you can, visit Berkeley and see this very fine collection for yourself.

A Short Fern-Foray in Nepal

Christopher Fraser-Jenkins
Kathmandu, Nepal

I've just had a rather exhausting but most enjoyable week fern-trekking in Nepal. I was showing Dr. George Yatskievych and Lisa Hooper from the USA some of the different Silver Ferns (*Aleuritopteris*) around Nepal for their molecular work on cheilanthoid ferns. It is an interesting genus I have worked on in detail in South Asia and elsewhere, separating the species and clarifying their nomenclature, also finding their range and detecting spontaneous hybrids between them.

The two Doctors came from Missouri Botanic Garden with an invitation from Tribhuvan University, Kathmandu, where they did some seminar-lecturing, and I had worked out an itinerary to allow them to see and collect as many species as possible in the short time they had available. Professor Krishna Shrestha and Jyoti Gajurel (the latter also accompanying us) from the University Botany Dept. arranged permits to collect limited amounts in National Parks - nowadays permits are almost universally required under the Convention on Biodiversity, which, if truth be told, actually does nothing to stop destruction of wildlife, but certainly makes botanical research very hard to cooperate in! As in so many countries it is used chiefly to block foreign scientists and indeed it has also become impossible in Nepal now for anyone but Nepalese organisations (and then with difficulty) to get permits, though export permits for some duplicate material which will be investigated were obtained for the team by Prof. Shrestha.

First we made an excursion up the highest mountain of the Kathmandu Valley, Phulchowki Hill, and found *Aleuritopteris anceps*, (photo pg. 28), *A. bicolor*, the mysteriously intermediate species, *A. dubia*, and the hairy *A. rufa* on old walls below the mountain. There was also a plant I found of the hybrid, *A. bicolor* x *A. rufa*, unable to make the characteristic white powder beneath due to its genetic mix-up. Unfortunately I also managed to stick my hand into a wasp's nest among the leaves and got stung all over my hands and had to run for it!

Up at the top of the mountain (10,000 ft.) the army allowed us to visit the small Shiva temple there with the valley appearing below through the clouds like a view from an aeroplane. There was plenty of *A. albomarginata* up there with its scaly costae and sometimes nearly efarinose fronds and we then collected the more special *A. grisea* and what I have long thought must be the related *A. stenochlamys*, on the rocks there - both high-altitude species with concolorous reddish scales, related to the South and C. American species, *A. mexicana*.

After Kathmandu we headed off west to beautiful Pokhara - I say beautiful, but being the monsoon period it was mostly raining, though still a lovely place.

We admired the very big and handsome species, *Aleuritopteris dealbata* (syn.: *Cheilanthes doniana*), with its 2 foot fronds, bright white beneath, growing on limestone cliffs near the big caves north of the town. It is the spectacular species I put a photo of on the cover of my previous book, "New Species Syndrome in Indian Pteridology". There are some fine cliffs along the river south of Mahendra Cave, with many *A. dealbata* hanging down, and I also found another *A. bicolor* x *A. rufa* plant, *A. bicolor* being the commonest, low to mid-altitude species with very triangular fronds atop long thin stipes. We came up some steps up the cliff after wading the river, which was a bit powerful at this time of year, just at the back fence of the British Gorkha Regiment Camp, rather to my surprise. At Mahendra Cave itself we found the very rare proliferous species, *Bolbitis tibetica*, which I first discovered there 10 years ago as new to Nepal or India. The area was being landscaped, but we were pleaded with the person in charge to try to keep the limestone rocks there with the *Bolbitis* and he seemed receptive to the idea. George noticed that it produces new plants from its roots - also shown in our area by *Diplazium sikkimense*, but not such a common phenomenon in general.

We had hoped to fly up to Jomsom to see *Aleuritopteris argentea* (I'm not sure yet if it is *A. argentea* or *A. subargentea* - they're difficult to tell apart), a Tibetan species that I found up there a few years ago to my great surprise. But the weather did not allow it as the little planes have to fly right between the peaks of Annapurna Himal and Dhaulagiri Himal; the one before us tried but had to turn back after being buffeted in the storm clouds. Alarming - rather relieved our plane didn't make a try! So instead, our next excursion was up towards the Fishtail Peak of the Annapurna Himal, as I once found *A. chrysophylla* there - the beautiful little highish altitude species with bright yellow powder beneath. We walked up through groves of graceful, waving tree ferns, *Cyathea spinulosa*, in large quantities, and up above to Poiyim village where I recognised the path I had been on years ago - and a friendly farmer's wife sold us a big cucumber, which was most refreshing after a long struggle uphill! A superb deep rocky gorge was just around the corner which I made a beeline (er, waspline?) for and immediately found big filmy plants of *Trichomanes striatum*, the climbing *T. auriculatum* and *T. birmanicum*, also huge fleshy fronds of simply pinnate *Diplazium javanicum* and a totally unexpected *Polystichum* with big glossy segments - a glance at the frond-apices showed it was proliferous - none other than the much more eastern *P. scariosum*, new to Nepal! The rare *Diplazium bellum* was also growing here and there and a filmy *Asplenium* of the unilaterale group - it was too deep and dark to see properly, but I later found it was none other than *A. hondoense*, very rare in India (only in the South I think) and now turned up in Nepal.

A horizontal walk then followed through very heavily leech-infested rainy moss-forest and my leech-socks slipped resulting in a writhing mass of the little blighters and a hundred or more itchy bites for 3 months, as I have a slight leech allergy - not good for ferny people! But an *Antrophyum* growing here and there on tree-trunks was the stalked, ovate fronded *A. obovatum*, not known west of the E. Nepal border until now - due to the anomalously high rainfall area around Pokhara, no doubt. However our leech-baiting promenade, led confidently by yours truly, unfortunately ended us up in a place which I think might have been far too far below where I first found the yellow

Aleuritopteris, with a path that petered out down an ever steeper drop - so I suppose we were lucky to find a way down at all, and had to abandon the search for the mythical yellow species, though I had found it in Bhutan earlier this year.

Our last morning revealed the whole Annapurna range of snow peaks and the impressive Matterhorn-like Fishtail Peak, gleaming up high in the morning sun above Pokhara - just so we knew the glorious Himalaya really did exist behind the monsoon clouds! So back to Kathmandu for pressing and putting the molecular samples in packets in silica gel. George had also made some cytological fixings for chromosome counting - important as there are various reports of aneuploid base-numbers in the genus, some of which are not quite clear as to identity or perhaps accuracy, and it would be good to reconfirm them and look for anything else occurring.

Our last trip was due north of Kathmandu, up a proverbial steep and rocky road to Dhunche in the Langtang Himal - a very fine National Park area on the Tibetan border, but also an all-day jeep drive through landslips and up umpteen zig-zag bends into the high Himalayan peak area. We stayed at a nice little Hotel "Langtang View" (superb view the last morning, again - of jagged Langtang Peak towering above, just like they said!), in Dhunche town - a sort of wild-west Bazaar perched on the great steep slopes of the upper Trisuli river, in the middle of, well, nowhere, really! Our climb began the next morning up a steep path by some big cliffs where I knew a very rare and spectacular *Aleuritopteris* grew - *A. tamburii*, once misreported as a *Doryopteris* from Nepal due to its leaf-shape. I crossed the ice-cold river to beneath the big cliffs where I first found it - only to find absolutely nothing! But a bit further on I knew it was right by the path, so we continued on up. The grapevine (my sister-in-law!) heard some mumblings about throwing F-J into the river if it didn't turn up, so I was rather wondering where I could quickly get a plant to stick in a crevice in the cliff before the rest of the party came up! However my hereditary primaeval dread of cold water was allayed when a small plant soon appeared up the cliff, just nicely out of reach - then George and Lisa found another one or two within reach to snip a frond off for molecularology, and I was let off the hook! It has a less divided, very triangular flat frond at the apex of a jet-black stipe, with broad segments, gleaming bright white beneath - and is only known from a handful of herbarium collections. It is a truly lovely fern. Further up George and Lisa finally found a big, fertile plant to collect some spores of. We then went on up the path to Deurali Lodge on the ridge above, overlooking miles of dense forest, for a refreshing Red Bull and potatoes, plus some local real bull-prancing challenges from Jyoti ('til the genuine bull turned, and one has seldom seen anyone retreat so rapidly!), then down



Aleuritopteris tamburii
underside

Photo courtesy of George Yatskievych

through populations of rather variable *Aleuritopteris albomarginata* and *A. formosana*, and back to a fireside feast at Dhunche.

Next morning we went back to Kathmandu - having found all except four of the Nepalese *Aleuritopteris* (*A. duthiei* - very rare in the north west; *A. chrysophylla* - next time, next time, maybe; *A. subvillosa* - up high, mainly in the east; and *A. subdimorpha* - very rare in one place in the Kathmandu Valley near Sankhu, where it was previously unknown so far west - but common around the Khasi hills in NE India). Let's hope the results of the study to come will be fruitful! Many thanks to George, Lisa and Missouri Botanical Garden for a very enjoyable and instructive trip. How about Papua, New Guinea, same time, next year??!! (Ah well! Only dreaming!).



Christopher Fraser-Jenkins Photo courtesy of Lisa Hooper



Aleuritopteris anceps
Photo courtesy of George Yatskievych

PROPOSED SOUTHEAST US FERN FORAY

Preliminary plans are underway for another exciting HFF/BPS tour.

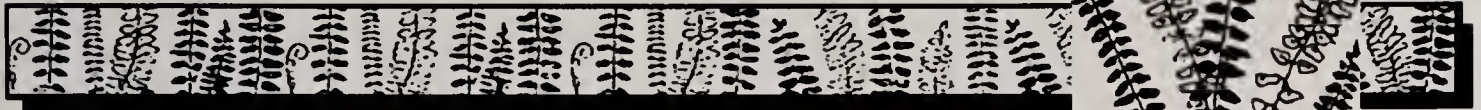
The foray would take place from **June 14 - 27** and take participants to public and private gardens as well as nurseries and field sites.

The tentative itinerary includes Georgia Perimeter Garden; Don Jacobs Nursery; Atlanta Botanical Garden; Birmingham Botanical Garden and private gardens in Birmingham; Huntsville Botanical Garden; nature center, private gardens, wild sites and tourist attractions in Nashville; Mammoth Caves National Park; Whitehall Historic Home and Garden and private gardens Louisville; field sites in eastern KY including aspleniums and their hybrids; wild sites in the Great Smoky Mountains, and along the Appalachian Trail; University of North Carolina greenhouse and fern garden; Sarah Duke Garden with botany specialists in Durham; Plant Delights Nursery, and JC Raulston Arboretum in Raleigh; and Magnolia Plantation Garden and historic buildings and gardens in Charleston, SC. The trip will begin and end in Atlanta, GA.

The tour is being organized by Naud Burnett who treated us to such a fantastic tour in Texas in 2007. He will be ably assisted by Kent Kratz .

For further information and to indicate an interest please contact (preferably prior to Feb. 15): Naud Burnett or Kent Kratz at Casa Flora, PO Box 41140, Dallas, TX 75241 or trip@casafloora.com.

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