

Hardy Fern Foundation Quarterly



THE HARDY FERN FOUNDATION

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The Hardy Fern Foundation was founded in 1989 to establish a comprehensive collection of the world's hardy ferns for display, testing, evaluation, public education and introduction to the gardening and horticultural community. Many rare and unusual species, hybrids and varieties are being propagated from spores and tested in selected environments for their different degrees of hardiness and ornamental garden value.

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

Satellite fern gardens are at the Stephen Austin Arboretum, Nacogdoches, Texas, Birmingham Botanical Gardens, Birmingham, Alabama, California State University at Sacramento, Sacramento, California, 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, Lewis Ginter Botanical Garden, Richmond, Virginia, 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, Lakewold, Tacoma, Washington, Les Jardins de Metis, Quebec, Canada, University of Northern Colorado, Greeley, Colorado, and Whitehall Historic Home and Garden, Louisville, KY.

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

Cover Design by Willanna Bradner

HARDY FERN FOUNDATION QUARTERLY

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QUARTERLY

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The Spore Exchange Needs You!

Please continue to send spores to:

Shannon Toal
9843 41st AVE SW
Seattle, WA 98136



President's Message

Welcome to a new year and, as of this writing a new spring season.

As is customary the Hardy Fern Foundation participated in the Northwest Flower and Garden Show in Seattle, Washington February 6 through 10, 2002. A very well organized educational booth displayed a variety of hardy ferns as well as a sequence of photographs demonstrating propagation techniques. There were many favorable comments as well as requests for further information and membership applications. Many thanks to Michelle Bundy and all of the generous volunteers who made this happen. (See photo pg 39)

On March first a small group of members met at the Bellevue Botanical Gardens to perform the annual ritual of grooming the ferns. The five year old plants are maturing and filling in nicely.

On March 12th the Hardy Fern Foundation Board Meeting was held at Lakewold Gardens in Lakewood, Washington. As we convened and conversed the rain clouds (*....sleet, ed.*) converged and after a short meeting we donned our rain gear to plant well over 100 ferns all donated by the HFF. With the cooperation of Nancy Dilworth, Katie Burki and Lakewold staff, John van den Meerendonk designed a plan to rejuvenate the existing fern garden and we are looking forward to viewing the results as the planting matures.

The annual Hardy Fern Foundation open meeting, Fern Festival sale and lecture will be Friday May 31, 2002 with the plant sale from 1:00 to 4:00, a brief meeting at 6:30 followed by Richie Steffen's lecture on shade gardening with special emphasis on the woodland plantings at the Elisabeth C. Miller Botanical Garden. Richie brings his enthusiasm and knowledge and the lecture promises to be an informative one indeed. We hope you can attend and look forward to meeting you and your friends to share information and experiences. The sale will continue on Saturday, June 1 from 10:00 to 2:00 with a propagation workshop at 11:00.

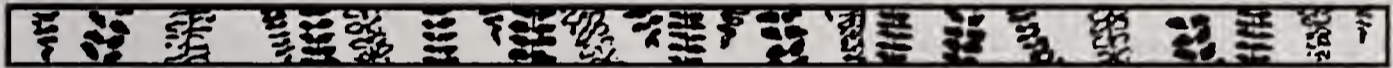
We can always use help in set up, sales support and take down. Please contact Michelle Bundy at (206) 835-1290 or e-mail @ thebundys5@attbi.com to schedule a convenient time.

Thank you all again for your diligent help and we look forward to seeing you soon.

Pat Kennar - Bellevue, WA



The Hardy Fern Foundation booth at the Northwest Garden & Flower Show.
Photo by Bors Vesterby.



Gardening Directory Update

Please note that the phone number for the Birmingham Botanical Gardens has changed to (205) 414-3900.

Spore Exchange Addenda

Sue Mandeville donated 12 *Woodwardia fimbriata* and 16 *Woodwardia areolata*.

From your web mistress... We are looking for volunteers to answer assorted incoming questions from the fern gardening public. There will not be a great deal of time involved but assistance would be greatly appreciated. Thanks to those who have already volunteered. - Sue Mandeville
Sueman@darkwing.uoregon.edu

Perry Creek Day Hike

Richie Steffen

Coordinator of Horticulture

Elisabeth C. Miller Botanical Garden

In late September eight friends of the Hardy Fern Foundation gathered for a day hike at Perry Creek. Perry Creek is located in Snohomish County, Washington, tucked in the lower hills of the Cascade Mountains. This unique location holds roughly 28 species of ferns and fern allies along a two-mile stretch of trail. During our trip we had the good fortune to find 19 of these species.

Over all the day was cool, gray and cloudy. We were lucky to not be rained out at this time of the year. The trailhead was a mix of red alder, big-leaf maple, and Douglas fir; of course, four of our most common ferns were present, *Polystichum munitum*, western sword fern, *Blechnum spicant* deer fern, and *Athyrium filix-femina*, Lady fern and the rambunctious *Pteridium aquilinum*, bracken fern. All four of these were found in abundance throughout the hike.

The beginning of the trail took us through dense conifer woodland. Only sword ferns and deer ferns and scattered clumps of salal, *Gaultheria shallon*, persisted in the dense heavy shade. When we reached more open ground plant life flourished, although most of it was lady fern and thimbleberry, *Rubus parviflorus*. Along these bramble thickets *Adiantum aleuticum*, maidenhair fern peeked out in moist areas along with a few *Polystichum andersonii*, Anderson's holly fern. *Polystichum andersonii* is a beautiful native with deep green upright arching fronds much like a small sword fern. Yet each toothed leaflet is pinnately divided giving a graceful and stately effect. One of the most fascinating traits of this fern is the ability to produce a vegetative bud on the midrib of larger fronds. As the fronds age and flop on the ground these buds can root and create a new plant. It is unfortunate that this plant is not widely available to the average gardener. The first colony we found had a few robust specimens reaching 24 to 30 inches tall, most of the others were between 12 and 18 inches. We saw several colonies during the hike mostly growing in light shade among vine maples or along the edge of the trail.

We crossed several talus slopes during the hike. These boulder covered hillsides provided a home for some of our more temperamental native ferns. The two most common we found in these areas were *Cryptogramma acrostichoides*, American parsley fern and *Asplenium trichomanes*, maidenhair spleenwort. The parsley fern has dark green dense fronds that look like a tight low mound

of parsley, until the stiff thin fertile fronds develop. The wiry fertile fronds remain dark green and upright throughout the winter creating an interesting texture in the rockery. We encountered several colonies of maidenhair spleenwort. This delicate small fern is common in many areas around the world. The dark purple-brown leaf stalk contrasts well with the tiny green leaflets. Many of the plants formed perfect little rosettes scattered among the mossy boulders. Both of these plants have been successfully grown in the Pacific Northwest if provided excellent drainage and bright indirect light.

We stopped for lunch along the third talus slope near some moss covered boulders containing a few healthy patches of *Selaginella wallacei*, Wallace's spikemoss and *Polypodium glycyrrhiza*, licorice fern. The licorice fern continued onto the deciduous trees and downed logs near by, clinging from the mossy trunks. After lunch we explored around the rocks and found two groups of *Polypodium amorphum*, irregular polypody. This little creeping fern clung to the undersides of a few boulders rooted firmly into cracks and crevices in the stone. The foliage looked like a typical *Polypodium*, but with each leaf



B. mutifidum frond. Photo by Bors Vesterby.

scarcely larger than two to three inches long and about an inch to one and a half inches wide. It created a very charming effect, but I do not know how you could successfully cultivate the plant without a tremendous amount of effort.

As we continued on our trail we saw a few new ferns. There were two species

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The Victorian Fern Craze and the American Christmas Fern

by John D. Scott

“The Victorian Fern Craze-A History of Pteridomania” by David Elliston Allen is a delightful little book (83 pp. - 1969) describing the exploits of the European and British fern gardeners and explorers of the 19th Century. One aspect of the “Craze” was the production of very intricate interior Wardian cases. Another was the discovery and naming of hundreds of fern “freaks” or unusual forms of ferns - particularly lady fern (*Athyrium filix-femina*), male fern (*Dryopteris filix-mas*, a complex now comprising several species), and the Hart’s-tongue fern (*Asplenium scolopendrium*).

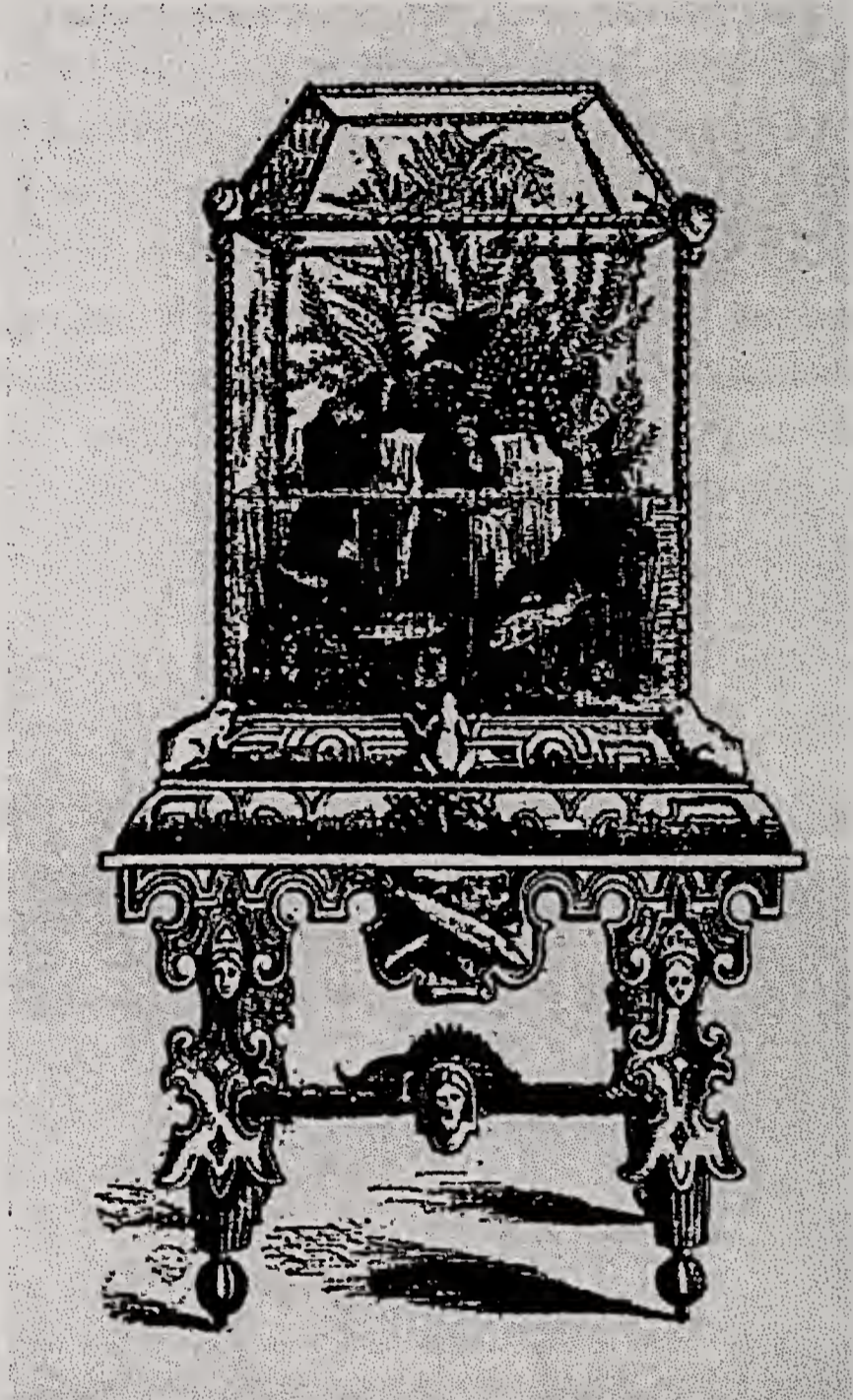


Figure 1. Wardian Case, Allen (1969)

The craze seemed to have passed America by - most likely because these same species in America are essentially free of these “freaky” abnormal forms. It may also be do to the fact the American botanists have been for the most part more interested in unraveling the complexities of the species involved in the fern complexes such as *Asplenium*, *Dryopteris*, and *Botrychium*.

This brings us to the Christmas fern, *Polystichum acrostichoides*. Current fern books have mostly ignored the interesting varieties of this eastern American native. Ferns to Know and Grow (F. Gordon Foster, 1984) states “The Christmas Fern has many variations and some have been named as forms.” He illustrates five variations (unnamed) of pinnae. Mickel’s Ferns for Ameri-

can Gardens (1994) lists, 'Crispum', 'Cristatum' (photo), 'Incisum' and 'Multifidum' (photo). The Plantfinder's Guide to Garden Ferns (Martin Rickard, 2000) lists none. The Fern Grower's Manual (Barbara Joe Hoshizaki & Robbin C. Moran, 2001) states "Various cultivar names are listed in the trade, such as Crispum', 'Cristatum' and 'Incisum'". I've seen the names as 'varieties' or 'forms' in botanies but have never seen them for sale.

The Christmas fern is fairly common throughout its range and has two characteristics that make it easy to recognize - one, its evergreen dark green fronds and two, its discrete pinna form. On any walk through the woods someone will cry out "there's the Christmas Fern". Every one will promptly agree and move on without further notice. They have missed an opportunity to discover perhaps a new and unusual form.

My first wild garden was begun in earnest at age twelve at my parents' house in Marple, Delaware County, Pa. Our woods had a lot of Christmas ferns but they were all similar and the typical form. One day Dr. Edgar Wherry took me to a garden in Newtown Square. There, in a small woods, was lots of variation

in form. Sometime later Dr. Wherry gave me a marvelous plant of the form 'multifidum'.

Recently I decided to actively find as many forms as I can. I began with a literature search and a survey of the specimens in the Herbarium of the Academy of Natural Sciences in Philadelphia. The list of named and unnamed forms currently numbers twenty-three. **I request that anyone who can provide living specimens of unusual forms contact me.**

"The Dodecatheon" newsletter of the Delaware Valley Chapter, North American Rock Garden Society v. 25, #6, p. 44 Nov.-Dec. 2001.

John D. Scott Rockland Botanical Garden 55 Hertzog School Road Mertztown, PA 19539 email: johndscott@mindspring.com

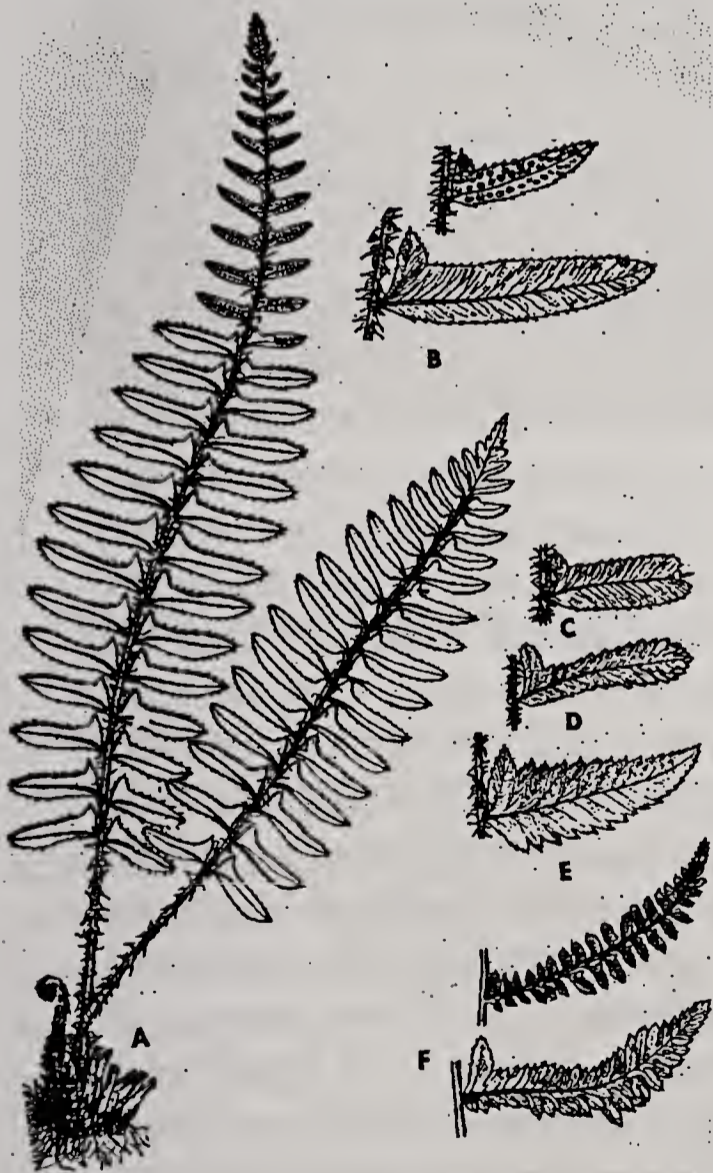


Figure 2. The Fern Guide, Wherry (1961)

Polystichum tsus-simense

Tsus-sima Holly Fern – Korean Rock Fern

James R. Horrocks - Salt Lake City, Utah

This rather neat and attractive fern is named for the island of Tsus-sima off Korea where it was supposedly first recognized. It is in many respects a miniature version of *P. rigens* or even *P. neolobatum* and dainty in its appearance. It is most similar to *P. luctuosum* from South Africa but is more finely divided and the pinnae are spaced further apart. Some authors treat this species as *P. tsus-simense* var. *tsus-simense* to distinguish it from the larger and more foliaceous *P. tsus-simense* var. *mayebarae*. Others feel there is but one species and *P. mayebarae* is an entirely separate species. *P. tsus-simense*, being a small-medium fern, was popular in years past grown in dish gardens, terrariums and as a houseplant. Its hardiness has been verified in many locations. It has thrived in the author's garden for over 20 years, taking temperatures well below zero. It remains somewhat evergreen if the fronds are protected by snow or leaves but turns brown if exposed to extremely cold air. *P. tsus-simense* is native to Japan, Korea, China, Taiwan and, according to Hoshizaki, ranges through Indochina, Thailand, and also the Himalayas. In Fraser-Jenkins monograph on Himalayan *Polystichums*, it is incorrectly listed as *P. luctuosum*. It is found in wooded areas among rocks and even growing in the open ground, preferring neutral to slightly acid soil.

Description: The rhizome is rather stout, short, and clump forming. It is covered with the basal stubs of old stipes. The stipes are pale green to straw-colored, brownish at the base with dense black-brown scales which become rather sparse upward. The scales are linear to nearly filiform above but oblong-lanceolate near the base. The blade is oblong-triangular, twice pinnate, with black veins, 8 to 18 inches long and ending in a long tapered point. The rachis is prominently scaly. The pinnae can be up to 2 inches in length and taper sharply. The pinnules are oblique, ovate to oblong-ovate, acute and spine tipped, sessile, grey-green and hairless above, with scattered hair-like scales on the underside. The pinnules also have spiny-toothed margins. The basal acroscopic pinnules of the pinna are enlarged and conspicuously separate. The auricles are occasionally free from the rest of the pinnule, a trait found more extensively in *P. xiphophyllum*. The author has noted the interesting similarity that exists in the emerging fiddleheads of *P. tsus-simense*, *P. xiphophyllum*, *P. mayebarae*, and *P. luctuosum*. (I have often wondered if there is some connection between fiddlehead appearances and how closely they are related.) The sori are in two rows on the pinnules, embedded in a sort of shallow pit. The indusia are flat, depressed in the center, and deciduous. The sporangia are very dark. The spores are dark brown. This species, like its



Polystichum tsus-simense. Photo by Richard Young, Salt Lake City, Utah.

close relative *P. neolobatum*, is an apogamous triploid and is easily grown from spore. Bumper crops are practically guaranteed.

Culture: *P. tsus-simense* does well in a cool, shaded location in humus-rich soil with good drainage but kept damp. As its common name suggests, it certainly is at home among rocks where its roots stay cool. It awakens rather early in the spring, so it may need protection from frosts. Old brown fronds should be cut away for neatness before new growth appears. It can be tucked away in little nooks and corners of the garden but makes a great companion to larger *Polystichums* as well as any of the *Cyrtomiiums*. In the author's garden,

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A Fern Foundation

Catharine W. Guiles - New Gloucester, ME

Very shortly after the end of World War II, my parents fulfilled a long-deferred dream by building a rustic, three-room summer cottage on the coast of Maine. Sometime during the 1950s they added a wing, comprising a screened porch, a new living-dining room, and kitchen. Alas, the quality of the construction work on the new wing gave problems year after year, particularly the chimney, which leaked constantly despite patching jobs.

The house and its pleasures and shortcomings became the responsibility of my brother and his wife when they took ownership of it after my parents built themselves a (sturdier) home in the 1960s on the same property. As I watched from my own abode (1970s) in this commune, my brother added, first, a sec-



The north-east corner of the house before work commenced. Note the row of interrupted ferns along the house's foundation. Photograph by Howard Chittenden.

ond floor to the 1940s wing, and then made plans for an expansion of the 1950s wing which, in addition to replacing the troublesome chimney and fireplace, involved redoing part of the foundation. This is, literally, where the ferns come in.

The foundation had, surprisingly, been built of concrete blocks and covered with stucco! Now anyone from New England knows that this is an unwise choice, and I do not understand why my parents' contractor chose this method of construction. The yearly freezings and thawings can crack the cement of such a foundation and cause the blocks to heave. In the nineteenth century, foundations here were built of enormous granite slabs; they rival the monuments of Egypt in solidity. Now, foundations are made of reinforced concrete. Yet why did this shabby foundation last for some 40 years? The answer is ferns!

When the 1950s wing was built, my mother transplanted Interrupted ferns (*Osmunda claytoniana*) from the adjacent woods to the east and north sides of the house. When my brother's contractor and his crew started work on the damaged portions of the foundation (having propped the house up with pressure-treated wood), they found that on the northern end of the house, the roots of these plants had invaded the cracks and crannies of the concrete-block wall to a depth of two feet and had literally replaced the cement and destroyed the cement blocks.

As Howard Chittenden, the leader of the effort, reported to me: "The fern roots had, over time, penetrated completely the porous surfaces of the masonry concrete block foundation to a depth of over two feet. As the roots grew and swelled, the composition of the masonry was broken down to one of its basic filler ingredients, sandy aggregate. The roots had fully replaced the porous cement-rich areas and had, in effect, Oremanufactured the masonry by binding and holding the aggregate together in a semi-structural form, still sufficient to hold up the building. But when we removed the ferns, the sandy aggregate making up the concrete block crumbled and could be scooped up by the hand full . . . as one would with beach sand."

The roots were packed in everywhere, he reported, and had caused the foundation to bow inward. They could not be removed with garden tools: I learned that a workman weighing 250 lbs tried and failed. The only way the crew could get these roots and masonry out was with a backhoe.

Why did these plants thrive so well? The drainage patterns of the land funneled water under the northern end of the house, thus creating a damp environment, and it must be pointed out that the coast's worse storms come from the northeast. The roots had plenty of moisture, enough to keep the plants green even in times of little rain. There is a mystery, though. Why did the

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Montane Ecuador – Ferns and Flowers for All (Part II)

Joan Eiger Gottlieb

August 25 – We bade goodbye to Maquipucuna after a pancake breakfast and were on the “road” back toward Quito. A stop at the Marianitas settlement (population ca. 500) allowed us to explore its new, bamboo-framed Community Center and view the Alambi River Valley behind it. Then it was on to 1800 hectare (4450 acre) El Pahuma Orchid Reserve, which lies in lower to upper montane transition forest at about 2000m (6560’). Orchid and fern numbers increased in this zone, and many examples of both were seen at the reserve. Among the ferns were *Adiantum patens*, *Asplenium cristatum* and *A. harpeodes*, *Dennstaedtia sprucei*, *Polypodium dasyleuron*, *Pteris fraseri*, and *Thelypteris cinerea*, all first time sightings for the trip. Also found were two ferns new for the area - *Megalastrum pulverulentum* and a *Diplazium* sp. A new education center was under construction near the entrance, and a pleasant waterfall splashed into a stream along the well-developed trail. *Guzmania* bromeliads bloomed alongside many native orchids. A blood-red angiosperm (Balanophoraceae,) which made its living as a root parasite, caught everyone’s eye, and large, white-tailed hillstar hummingbirds sipped at flowers (there are 1700 species of birds in Ecuador). 25 fern species were found at the orchid reserve, 12 new for our trip, and 2 new records for the area.

In Quito, a stop at the National Herbarium enabled Dr. Webster to drop off pressed specimens from Maquipucuna for proper drying and storage. The personal library of the famous botanist Al Gentry is here, along with about 160,000 specimens. The herbarium is operated by the Jatun Sacha Foundation, and funds are desperately needed to compensate for government budget cutbacks. Overnight was spent comfortably at the authentic, Spanish colonial Hacienda Carriona in Sangolqui, a town in the Valle de Los Chillos just south of the capital.

August 26 – Papallacta Pass at the edge of the Antisana Reserve is a páramo ecosystem 40km (25 mi) southeast of Quito at about 3140m (10,300’). The steady uphill drive to the pass was relieved by a stop at the natural hot springs (Aguas Termales) and restaurant at Papallacta village. Snow-capped Antisana volcano formed an imposing backdrop for this volcanically heated area, and we relished the fresh, local trout we had for lunch. Traveling closer to the pass, and wearing everything we owned against the cutting wind at this elevation, we made several exploratory stops. The first was at an upper montane forest remnant where a yellow *Calceolaria* (Scrophulariaceae) bloomed amidst wild *Fragaria*, *Peperomia*, *Oenothera*, *Geranium*, and other familiar flowering plant genera. *Pellaea ternifolia*, *Polypodium (Pleopeltis) murorum*, *Adiantum poiretti*, and *Asplenium castaneum* were our first-time fern finds. The trans-Andean oil pipeline crosses this part of Ecuador, an OPEC member.

The second stop at about 3350m (11,000’) in the *Polylepis* (tree Rosaceae) Forest Zone yielded our first sightings of the fern genus *Jamesonia*. Its 19

neotropical species are found in páramo ecosystems from southern Mexico to Bolivia, plus a few high spots in Brazil. *Jamesonia goudotii* had disc-shaped, simple pinnae crowded on linear fronds, a morphology that gives this weird fern genus the look of pipe-cleaners with coiled, indeterminate tips. Other interesting pteridophytes at this site were *Polystichum orbiculatum* (very xeric, compressed fronds), *Elaphoglossum mathewsii* (virtually a weed on roadside banks), and *Lycopodium magellanicum* (a club-“moss” of variable form, but similar in general appearance to the widely occurring *L. clavatum*).

Leaving all tree species behind, the third stop of the day was at Papallacta Pass near 3500m (11,500'). We had clear, sunny skies and fairly mild temperatures in which to enjoy heroic specimens of *Puya hamata*. The spiny-leaved rosettes of this unusual bromeliad resembled small century plants, except for the very “wooly” flowering spikes studded with small blue flowers. Mound plants (Asteraceae) cushioned the ground, their tiny white flowers making up in abundance what individually they lacked in size. Gentians bloomed abundantly alongside wild lupines. Among the xeric pteridophytes was the amazing, red-colored *Huperzia crassa* var. *manus-diaboli* (“hand of the devil”). Fertile clumps of *Elaphoglossum ovatum* and stiff-fronded colonies of *Melpomene sodiroi* were common. The páramo is the equatorial equivalent of an alpine zone in temperate parts of the earth. The ground does not freeze, and there is little or no snow, but wind, cold air temperatures and high solar intensities prevail all year. It is a starkly compelling place, with unique floristic features.

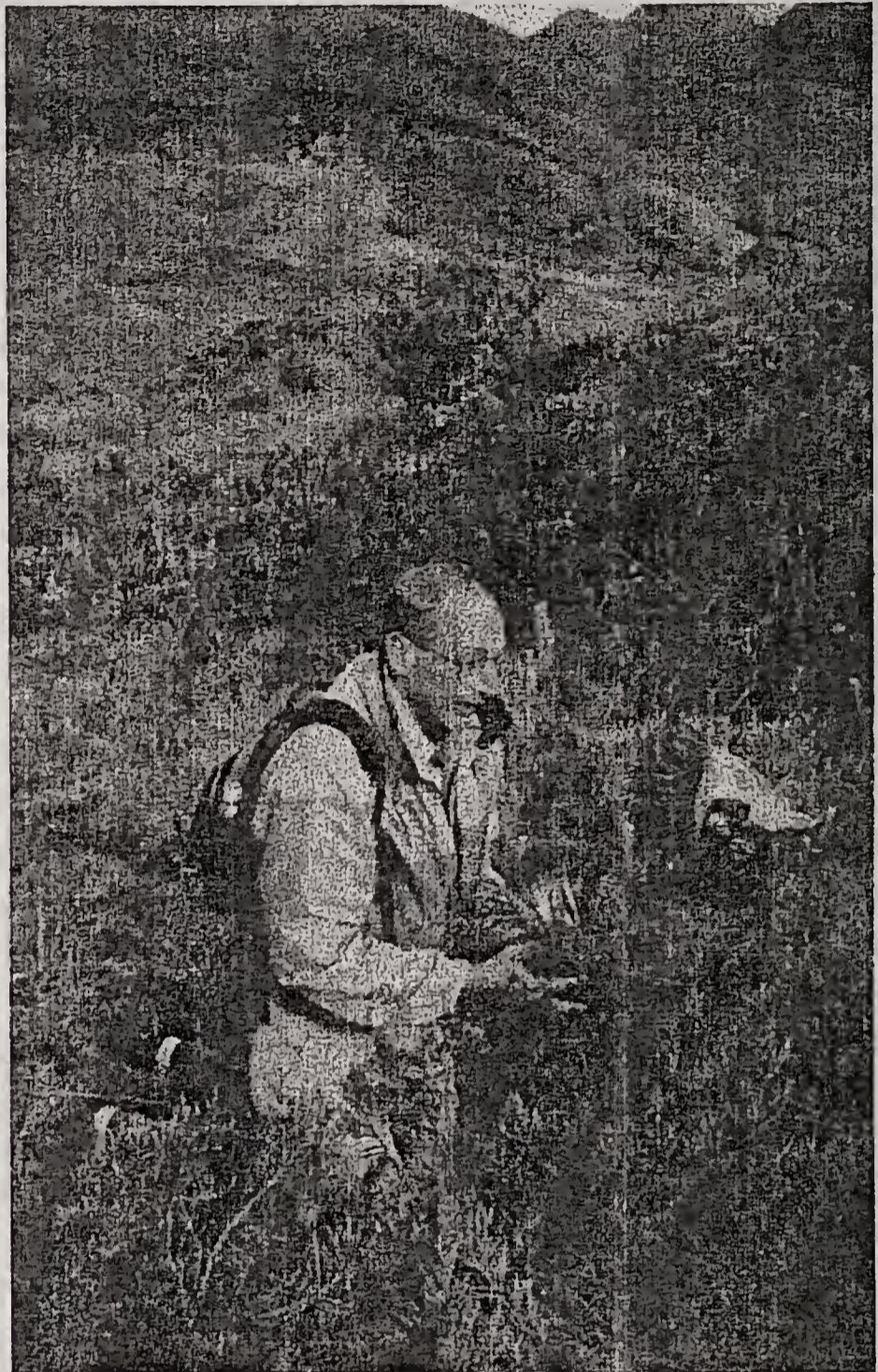
Lophosoria quadripinnata was spotted at our lunch stop below the pass. It had a short, creeping stem, but its huge foliage gave it the look of a tree fern. *Thelypteris pilosula*, new to the area, was also present. Along Lake Papallacta fertile colonies of *Asplenium polyphyllum*, together with *Polypodium wiesbaueri*, hung from a road bank; neither had been seen previously. A mistletoe in the genus *Psittacanthus* (Loranthaceae) had bright red flowers that contrasted with the soft pink blossoms of *Macleania* shrubs (Ericaceae). The rest of the afternoon was spent back at the pass where Alan Smith and Carl Taylor (“Dr. Quillwort”) found populations of *Isoetes andina* growing in páramo meadow seeps. This amazing quillwort was a showstopper, with tough, dark-green leaves radiating from corms the size of large turnips. It was the most robust *Isoetes* I had ever seen. Considerable elbow grease and a sturdy trowel were needed to dig out a specimen, while Dr. Taylor grinned like a Cheshire cat with his catnip prize. We were all smiling after such a satisfying foray as we headed back to the warm comfort of the Hacienda Carriona. 30 pteridophytes were seen this day, 23 for the first time on the trip, and 1 new for the area.

August 27 – After a morning in Machachi (pop. ca.10,000), 35km (27 mi) south of Quito in the central valley, where an outdoor farmer’s market presented a colorful array of fruits and vegetables (including at least a dozen different varieties of potatoes), we were off to Cotopaxi National Park on the

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Montane Ecuador - Part II *continued from page 49*

eastern slopes of the Andes. Cotopaxi, at 5897m (19,348'), is reputedly the highest active volcano on earth, although its activity has been minor since its last big eruption in 1877. National parks in Ecuador are much less pristine than those in the U.S. There was an entry pay station, a tiny museum, some undeveloped camping and picnicking areas, and protection for several volcanic peaks. Otherwise, the lower elevations were farmed, ranched and fenced. That said, there was excellent páramo to explore on the way to our lunch stop at Lake Limpio (3830m, 12,566'). Carl Taylor found a population of another *Isoetes* at wet edges of



W. Carl Taylor with *Isoetes andina* at Papallacta Pass.

the lake. Six different *Elaphoglossum* species, at least 3 of which we had not seen at other locations, were identified near rock bases. Xerophytic ferns-like *Polypodium pycnocarpon* and *Jamesonia imbricata* were also new for the trip.

Red, berry-like seed cones of *Ephedra americana* were the only visual clues to spotting the miniature, green-twiggy, gymnosperm shrub that produced them. Two other shrubs near this elevation were *Chuquiraga jussieui* (Asteraceae) with bronze-colored, woody bracts surrounding large inflorescences, and *Valeriana macrophylla* (Valerianaceae) with spires of tiny white flowers. Shrubs were rare parts of the páramo flora, confined to the protection of large outcrops. Most of the seed plants were of the rosette or cushion type, growing flat on the gravelly soil and exposing attractive, often disproportionately large flowers to the few available pollinators – true “alpine” jewels. Among them

were two distinctive gentians - lavender-pink *Gentianella cerastioides* and yellow, spurred *Halenia weddelana*. *Werneria nubigena*, a ground-hugging composite with outsized, white daisy blooms, had rose-striped undersides. The floral biodiversity was not high, but there were sizable populations of the species that had adapted successfully to the harsh ambient conditions. It would be a challenge to bring such highly modified plants into the horticultural trade, but there would surely be great demand for these beauties. On clear days, excellent views of the glaciers that cover the flanks of Cotopaxi above 4500m (15,000') can be enjoyed from the high elevation plateau that is the páramo around the lake.

The wisdom of our shift to two vans that morning was confirmed as we drove onward over an increasingly bumpy, dirt track toward our evening destination. A welcome roadside stop yielded such páramo treasures as the rare grammitid fern *Terpsichore heteromorpha* under a rock overhang. *Melpomene moniliformis*, another grammitid, shared the shelter. Two species each of *Jamesonia* and *Huperzia* were abundant, including the eye-catching, red variety of *H. crassa*. Angiosperms included the strange *Lasiocephalus ovatus* (Asteraceae) with a single yellow "flower" atop each nodding stalk, a species of *Crassula* that was a *Huperzia* look-alike, and *Baccharis prostrata*, a yellow-flowered, composite shrub whose species name said it all. We saw 27 pteridophytes that day, 13 for the first time during the trip and 1 new to the area.

At 8km (5 mi) per hour (maximum speed for the "road" conditions) it took over 3 hours to cover the 25km (15.5 mi) from Cotopaxi N.P. to Hacienda Yanahurco, the 65,000 acre ranch at 3500m (11,480') that was to be home for the next two nights. The ranch is owned and run by Fernando Cobo and his wife Edu, along with Ecuadoran Indians who live there and serve as ranch hands, guides, cooks, and housekeepers. This private "ecological reserve" has the lofty motto "Nature First – We Mean It". However, the pounding and grazing impact of hundreds of hooved herbivores on the fragile Andean landscape is all-too-clear and quite unpleasant for hikers. To enhance nutrition for the cattle, imported forage grasses are being planted. On the positive side, there are parts of the ranch that remain as páramo, and there is a sizeable high elevation forest at the far end of the Tamboyacu River that runs through the property. Four imposing volcanoes surround the ranch: Cotopaxi, Antisana, Quilindaña and Sincholagua – altogether an awesome Andean scene.

Fishing, horseback riding, hiking, and nature study are major activities for guests at the ranch. The rare Andean condor, as well as the variable hawk, black-faced ibis, carunculated caracaras, and other birds find sanctuary here. Andean black bear, white-tailed deer, and puma can be found. Unfortunately, there is a large herd of wild horses roaming the ranch. These animals, as well as the ones corralled at the Hacienda, are descendants of horses brought to the area by the Spanish conquistadors in the 1500's. They are rounded up each November for hoof trimming, since the terrain does not provide enough natu-

continued on page 52

Montane Ecuador - Part II *continued from page 51*

ral abrasion to prevent grotesque overgrowths that can cripple the animals. Clearly the area is not suitable for these non-native animals, and the conservation ethic of the ranch is not a complete reality. Our rooms were very comfortable, with wood fireplaces or propane heaters in each. Electrical generators were turned off from 10 PM to 8 AM to conserve fuel. The large game/living/meeting room had a rustic décor and a large fireplace (much needed against the night cold). The dining room was mostly open, so there was some competition for tables close to the central fire pit where large beef fillets were grilled for us the night we arrived. Advertised as the “best beef in Ecuador,” it did not disappoint. Even the vegetarians among us could not resist. It was mind-bending to think that all the wood, fuel, furnishings, and most of the food had to be hauled in over the same bone-jarring vehicular track we had traversed to get here.

August 28 – A full day was ours to explore Yanahurco. Since the principal activities were done on horseback, most members of our intrepid group mounted up after breakfast (making for some interesting photos) and set out for a 3-4 hour ride each way to Sebretana Waterfall and the woodland area near the edge of the ranch. Their principal reward for a hard day in the saddle was *Blechnum auratum* (= *B. buchtienii*), a cycad look-alike that grew as a small tree in open, boggy areas of páramo. It is a dimorphic species with a fat trunk and a crown of leathery, sterile fronds and narrower, fertile ones. Large, albeit trunkless specimens of *Blechnum loxense* also thrived, along with two new (to us) *Elaphoglossum* species, *E. squamipes* and *E. papillosum*. *Jamesonia rotundifolia* and *J. alstonii* were abundant, the former a large species with chunky segments and a rusty coloration. Several of us, who were horse-averse, elected to hike the Tamboyacu River Trail, allowing us to find clumps of thin, sharp-angled *Huperzia tetragona* on steep banks, and a colony of *Botrychium schaffneri* among the native *Stipa* grass hummocks that dominated the plateau. At a hut about 4km (2.5 mi) from the Hacienda our Ecuadoran guide prepared a hot lunch for us over an open fire. It was typical of the special, solicitous service we enjoyed at the friendly hands of our hard-working Ecuadoran hosts everywhere we went. The return walk over gently rolling terrain in warm afternoon sun was an indelibly pleasant experience; the elevation made even short hikes quite exerting. The total pteridophyte catch for the day was 24, with 11 of those species new for the trip.

August 29 – Before leaving Yanahurco there was a flurry of plant sharing between equestrians and walkers and plant pressing by the pros. The long trip back to Quito through Machachi was punctuated by a lunch stop at a small roadside reserve, where 9 of the ferns we had seen earlier in the trip were found and “frondled” for the last time. Back in Quito the serious botanists visited the fine herbarium at Catholic University (Pontificia Universidad Católica del Ecuador), not far from the Hotel Quito where we spent our last night. A banquet that evening at the “restaurant with a view” atop the hotel gave us a chance to say our goodbyes and thank our leaders. It was their

patience, expertise, energy, and friendship that made Montane Ecuador such a fantastic journey. Most of the group left the hotel at 4 AM the next day for their flight home, but 5 of us went on to another great adventure in Ecuador's Galapagos Islands. But that is a story for another time.

Special thanks go to Dr. Alan Smith for his much appreciated help with this trip report. His willingness to review and correct the text was my security blanket for the project. Layne Huiet, fellow fern enthusiast and trip participant, provided valuable help, particularly with plant lists.

SUMMARY OF PTERIDOPHYTA for the Montane Ecuador Trip, Aug. 21-29, 2001

Genera	# species Seen	(# primarily páramo)	Genera seen	# species	(# primarily páramo)
<u>Fern Allies:</u>					
<i>Equisetum</i>	1		<i>Lycopodiella</i>	1	
<i>Huperzia</i>	7+	(4+)	<i>Lycopodium</i>	3	(3)
<i>Isoetes</i>	3	(3)	<i>Selaginella</i>	4+	
<u>Ferns:</u>					
<i>Adiantum</i>	6		<i>Megalastrum</i>	4+	
<i>Alsophila</i>	2+		<i>Melpomene</i>	4	(2)
<i>Asplenium</i>	18	(4)	<i>Microgramma</i>	2	
<i>Azolla</i>	1		<i>Micropolypodium</i>	1	
<i>Blechnum</i>	10	(3)	<i>Nephrolepis</i>	2	
<i>Botrychium</i>	1	(1)	<i>Niphidium</i>	3	
<i>Campyloneurum</i>	8+	(1)	<i>Olfersia</i>	1	
<i>Cheilanthes</i>	1		<i>Pecluma</i>	4	
<i>Cochlidium</i>	1		<i>Pellaea</i>	1	
<i>Ctenitis</i>	1		<i>Pityrogramma</i>	1	
<i>Cyathea</i>	5+		<i>Pleopeltis</i>	1	
<i>Cystopteris</i>	1	(1)	<i>Polybotrya</i>	3+	
<i>Danaea</i>	2		<i>Polypodium</i>	15	(5)
<i>Dennstaedtia</i>	6		<i>Polystichum</i>	3	(2)
<i>Didymochlaena</i>	1		<i>Pteridium</i>	1	
<i>Diplazium</i>	12		<i>Pteris</i>	7	
<i>Diplopterigium</i>	1		<i>Radiovittaria</i>	1	
<i>Elaphoglossum</i>	30+	(10+)	<i>Saccoloma</i>	1	
<i>Gleicheniella</i>	1		<i>Sphaeropteris</i>	1	
<i>Hymenophyllum</i>	4		<i>Sticherus</i>	3	
<i>Hypolepis</i>	4+	(1)	<i>Stigmatopteris</i>	1	
<i>Jamesonia</i>	4	(4)	<i>Tectaria</i>	4	
<i>Lastreopsis</i>	1		<i>Terpsichore</i>	7	(2)
<i>Lellingeria</i>	2		<i>Thelypteris</i>	21+	(4)
<i>Lophosoria</i>	1		<i>Trichomanes</i>	4	
<i>Macrothelypteris</i>	1		<i>Vittaria</i>	1	

TOTALS for the trip: 58 genera, 240+ species of pteridophytes seen
27 of the species seen were new listings for the areas visited

Oaxaca Journal by Oliver Sacks

Review by Jeanie Taylor - Seattle, WA

When Oliver Sacks was on a book tour for his *Uncle Tungsten: Memories of a Chemical Boyhood*, I heard an interview with him and was struck by his engaging, warm, self-effacing, even retiring style. In passing, he mentioned that another book of his would be published soon, a journal he had kept on a trip to Mexico with “some botanists” to look for ferns. Botanists, a fern foray, Oliver Sacks – what could be better? *Oaxaca Journal* can be enjoyed during a rainy weekend or a trip to the beach. This small volume, one of a series put out by the National Geographic Society, will be found in the travel writing section. That’s a clue that you might not find all the fern information you expect in an account of a trip devoted to them, led by John Mickel, fern authority and co-author with Joseph Beitel of *The Pteridophyte Flora of Oaxaca, Mexico*.

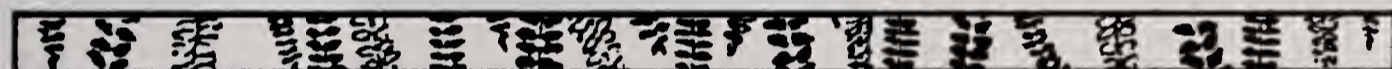
In this journal (charting an “intermediate course” as he says in his preface, between unmodified journal entries and an expanded and edited book form), Sacks takes the reader on his ten day journey to visit another country as well as the flora and fauna. In entries which are like letters home, he relates bits of conversation with which anyone who has been on a few botanical field trips might be familiar: speculations about why this or that occurs, evolutionary relationships, fauna interactions; also much more: chemistry, childhood memories, observations about Sacks’ own personality, ancient cultures of the area, pre-Columbian history and archaeology.

Sprinkled throughout the journal are introductions to some (but not all?) of the field trip participants. Little by little, one realizes that the people he is travelling with are authorities in many fields - some are towering figures. There is a wealth of ideas percolating and a level of erudition that makes this trip truly special, although what drew Sacks to document it was (to paraphrase his preface again) the open, noncompetitive, adventurous atmosphere of the American Fern Society. Eagerly jumping out of the tour bus to exclaim passionately over birds, ferns, plants, whatever their particular interest may be, all are congenial, open, and always curious. Some like Sacks, are focusing their interest on subjects other than those of their professions.

Sacks himself, a well-known author and neurologist has somewhat arcane interests which, in his understated manner, he scarcely discusses but which a reading of the dust jacket reveals: his memberships include the New York Mineralogical Club and something call the New York Stereoscopic Society.

He mentions that he is the only one who has brought a stereo camera. Unfortunately, we never get any information about how it works, or if he used it much. Likewise, Sacks mentions early on that more than ferns, he is interested in bryophytes, but we learn very little more about them. But no matter, really - this is Oliver Sacks' journal, and he states in the preface that what drew him to write about it was the people. Perhaps because he is primarily interested in people, and because this is apparently his first visit to the region, Sacks dwells more and more on the human aspect of the landscape and less on the botanical as the trip progresses and this enriches the experience for the reader.

Thankfully, there are botanical nuggets, and he adds the illustrations of Robert Rauh, an illustrator with the New York Botanical Garden, to give a taste of the ferns. Learning the origins of the species names *beitelii* and *halbergii* made that information personally meaningful. There is a scientifically satisfying, yet concise discussion of subjects like cacao and cochineal among others he expanded upon to flesh out the journal style, which is much appreciated. This enjoyable, truly personal and thought provoking account conveys the atmosphere and enjoyment of an interesting trip written by a scientist with a scientist's enthusiasm, precision, and wide ranging curiosity.



Polystichum tsus-simense continued from page 45

it is a handsome companion to the larger and lighter green *P. rigens*. It is hardier than many realize. In over 20 years not a single clump has been lost in even the coldest of winters in Salt Lake City. For a most elegantly beautiful little rock fern, *P. tsus-simense* fills the bill.

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Flora of Japan (1965) Jisaburo Ohwi, Smithsonian Institution, Washington, D.C.

Fern Grower's Manual (revised 2001), Barbara Joe Hoshizaki & Robbin C. Moran, Timber Press, Portland, OR

The Plantfinder's Guide to Garden Ferns (2000) Martin Rickard, Timber Press, Portland

Ferns for American Gardens (1994) John T. Mickel, Macmillan Publishing Co. New York

Himalayan Ferns, A Guide to Polystichum (1997) C. R. Fraser-Jenkins, International Book Distributors, Dehra Dun, India

A Fern Foundation *continued from page 47*

ferns thrive in the alkaline environment of this foundation? Their cousins in the woods grow in a forest dominated by oak trees, which create a highly acidic condition.

When all the renovation work was done, the ferns along the north side of the now extended wing were not replanted; there is an attractive terrace around the area which has been landscaped differently. However, along the east side, which was a little drier, the foundation was not attacked in the same way, and the ferns continue to grow as they have for the past 40-odd years.

It occurred to me that one or another of the general reference books on ferns might have something relevant to say about fern roots, particularly those of the Osmundas. I found an apt passage in Edward Frankel's *Ferns: A Natural*



Work in progress. Note the badly damaged concrete blocks. Photograph by Howard Chittenden.

History . He writes: "Ferns that live in swamps, such as the cinnamon fern, grow large clumps of surface rootstocks and rhizomes that look like big old shoe-brushes half submerged in mud. Some of these rootstock masses are as much as one hundred years old and look it-shabby, partially decayed, and withered, but with enough vitality to put forth beautiful bunches of tall, bright-green fern fronds every spring."¹ My brother's clumps were half the age of those Frankel describes, but, with omission of the mentioned swamp habitat, this description suits them very well.

If you have an old house with a bad foundation, and if your budget does not permit replacement at this time, just plant a few ferns and let nature take her course!


Acknowledgment

I wish to thank Howard Chittenden, of Blue Hill Falls, ME, for his detailed explanations of the above phenomenon and for his photographs.

Reference

1. Frankel, Edward. 1981. *Ferns: A natural history*. Brattleboro, VT: The Stephen Greene Press, p. 23.





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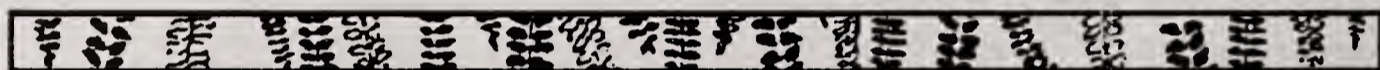
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Perry Creek Day Hike *cont. from page 41*

of *Botrychium*, *Botrychium multifidum*, leather grapefern and *Botrychium virginianum*, common grapefern. Both of these species were growing within a few feet of each other. Not too far from these were was a small patch of *Cystopteris fragilis*, fragile fern and some small *Dryopteris expansa*, spreading woodfern. Along the trail we also found two isolated *Dryopteris filix-mas*, male ferns.

Further up were small colonies of *Polystichum lonchitis*, northern holly fern. It has the appearance of a smaller more refined sword fern. Scattered in the moss and holly ferns was a species of *Lycopodium*, probably *Lycopodium clavatum*, running clubmoss.

We reached our final destination a dramatic waterfall. We took a break and enjoyed the good weather and noticed one more fern to add to our list, a large spreading patch of *Gymnocarpium disjunctum*, western oak fern. We returned to our cars and reflected on the trip, looking forward to our next hike at Perry Creek.



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NEW JERSEY FERNS AND FERN-ALLIES, by James D. Montgomery and David E. Fairbrothers, Rutgers U. Press, 109 Church St., New Brunswick NJ 08901, 1992. 293 pp., \$50.

Review by Joan Gottlieb

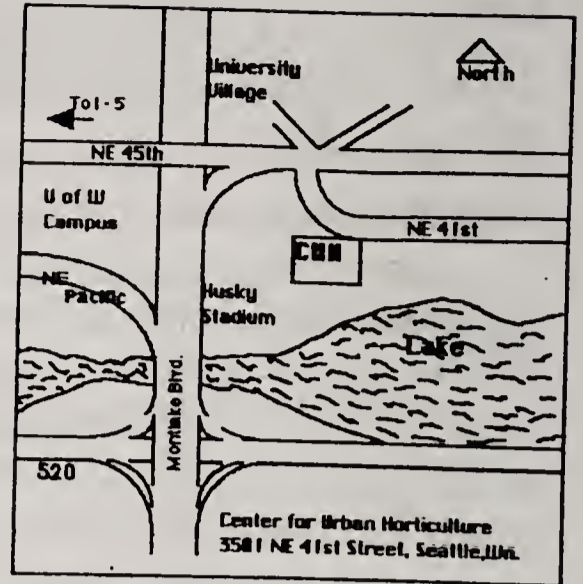
An upcoming field trip to New Jersey sponsored by the HFF in July offers a welcome excuse to spend some quality time with my much-used copy of *New Jersey Ferns*... It is still the most current reference work for the pteridophytes of this densely populated, yet floristically diverse state where the coastal plain commands the landscape, but the Appalachian Mountains come closest to the ocean in its northwest corner. The beginning of the book contains a description of the ecology, classification (with keys), and distribution of New Jersey's ferns, including a very helpful discussion of the major geological regions and their associated plant communities. There is even a history of fern collecting in the state spanning 250 years by such famous botanists as John Bartram, André Michaux, Thomas Nuttall, and John Torrey. A section explaining hybrids is not unexpected, since Montgomery is an expert on *Dryopteris* hybrids, and because the book covers 32 hybrid pteridophytes (including, on p. 76, the first known hybrid clubmoss – *Lycopodium X copelandii* Eiger – that I described from New Jersey's pinelands in the 1950s).

In addition to this amazing array of hybrids, the book covers 83 species of New Jersey ferns and fern-allies. The plants are presented phylogenetically (by relationship), rather than alphabetically (which would have been a tad more user-friendly for non-scientists). Each species is given double page treatment. On one page there is an excellent description of the plant, its habitat, range, chromosome number, endangerment status, and other items of interest to naturalists, gardeners, conservationists, et al. On the facing page are line drawings (including enlarged diagnostic details) by Kathleen L. John-Alder, and a state map with known locations for the species indicated by dots graduated in size to indicate how recently collections were made.

If one needs to be critical of this excellent book, it would be about the stingy size of these distribution maps. Enlarging them to fill the abundant blank space would make them a lot easier on the eye. Also, it should be noted that *Flora of North America, Vol. II*, 1993 has updated scientific names for several of the taxa reported in *New Jersey Ferns*... For example, the silvery glade fern *Athyrium thelypteroides* is now *Deparia acrostichoides*, and my own little bog clubmoss hybrid is now in the genus *Lycopodiella*. To paraphrase and "update" the bard – a fern by any name is just as sweet to find. And in New Jersey, this book will help you do just that. The volume ends with a useful checklist, references, and complete index. - Joan Eiger Gottlieb.

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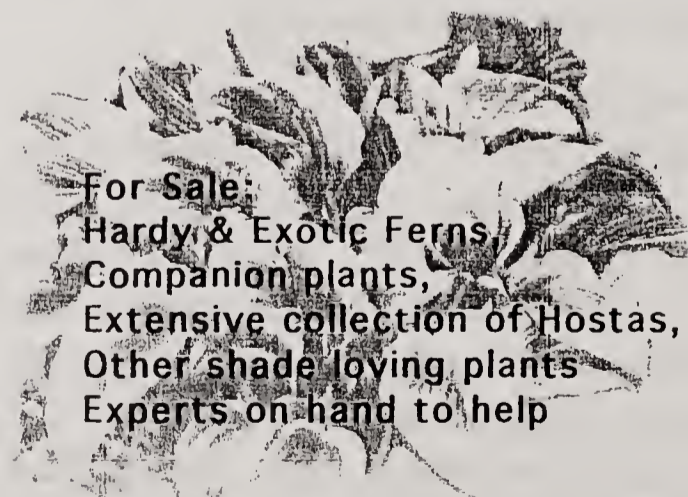
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