



**Hardy Fern Foundation
Quarterly**

Spring 2018

THE HARDY FERN FOUNDATION

P.O. Box 3797
Federal Way, WA 98063-3797
Web site: www.hardyferns.org

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

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

Affiliate fern gardens are at the Bainbridge Island Library, Bainbridge Island, Washington; Bellevue Botanical Garden, Bellevue, Washington; Birmingham Botanical Gardens, Birmingham, Alabama; Coastal Maine Botanical Garden, Boothbay, Maine; Dallas Arboretum, Dallas, Texas; Denver Botanic Gardens, Denver, Colorado; Georgia Perimeter College Garden, Decatur, Georgia; Inniswood Metro Gardens, Columbus, Ohio; Lakewold, Tacoma, Washington; Lotusland, Santa Barbara, California; Rotary Gardens, Janesville, Wisconsin; Strybing Arboretum, San Francisco, California; University of California Berkeley Botanical Garden, Berkeley, California; and Whitehall Historic Home and Garden, Louisville, Kentucky.

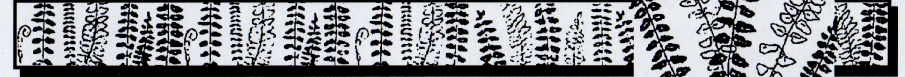
Hardy Fern Foundation members participate in a spore exchange, receive a quarterly newsletter and have first access to ferns as they are ready for distribution.

Cover design by Willanna Bradner

HARDY FERN FOUNDATION QUARTERLY

**THE HARDY FERN FOUNDATION
QUARTERLY**

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Welcome New Members!

Judi Alvau
Alana Chau
Annette Clingman
Danilo Duran
Bruce Eberle
Fieldstone Studio
Sharron A. Fitzgerald

Debby Heid
Michael Heim
Kris LaMar
Jancy Lovell
Bridget McNassar
Geneva Norton
Peter Steiner

President's Message

Spring is always one of the most exciting times in the garden. With every walk there is something new emerging from its winter slumber or bursting into bloom. As of this writing in early April I have just spent time at one of my favorite nurseries for ferns, epimediums and hostas: Sebright Nursery in Salem, Oregon. A number of ferns had crosiers emerging and it was interesting to see which were first on the spring scene! Although, it was a bit early to see most of the ferns in full growth, the timing was perfect to see one of my favorite fern companion plants, epimediums. Sebright's selection is huge and most were in full bloom during my stay. I barely had room for my luggage when I left!

There are few things more fun than looking for that something special for the garden and finding a new and interesting fern. If you are in the Seattle area on Friday, June 1st be sure to stop by the Center for Urban Horticulture at the University of Washington for the Hardy Fern Foundation's annual Fern Fest, Fern and Rare Plant Sale. This year the sale will be shortened to a single day, Friday June 1st, from 10am-4pm. The HFF will have a great selection of ferns that were raised by our curator, Jo Laskowski, along with plants and more ferns from other specialty growers in the area. Over the years my garden has filled with choice selections from this sale. It is definitely one not to be missed!

This summer is also shaping up to be a fun season with several classes our education committee chair, Pat Riehl, has set up. Those members who always wished they could take a decent picture with their smart phone need to sign up for a special class with professional photographer, David Perry. This evening class will be held in a beautiful private garden in Medina, Washington. I cannot think of a better way or a more beautiful place to spend an evening with fellow fern friends! Founding board member, Sue Olsen, will also be teaching a fern identification class this summer. Sue's wealth of knowledge and her ease at conveying it is delightful. This is the perfect opportunity to learn the basics of figuring out how to tell your ferns apart.

For those further afield than the Seattle area I will be speaking for the Birmingham Fern Society on May 16th at the Birmingham Botanical Garden, Alabama and Whitehall Gardens in Louisville, Kentucky on June 17th. If you are in the area I hope you can make it; I am looking forward to seeing lots new ferns and meeting new people.

All the best ~ Richie

2018 Hardy Fern Foundation Fern Fest - Fern and Rare Plant Sale

Friday, June 1st, 2018 10:00am to 4:00pm*
Center for Urban Horticulture, 3501 NE 41st St, Seattle, WA 98105

**Please note that Fern Fest is one-day only this year*

Vendors: Bouquet Banque Nursery, Foliage Gardens, Growing Girls, Hardy Fern Foundation, Keeping It Green Nursery and Sundquist Nursery

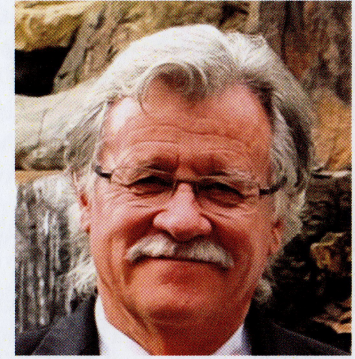
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Hardy Fern Foundation Quarterly

Woodwardia areolata Netted chain fern Narrow-leaved chain fern

James R. Horrocks

Salt Lake City, UT



We're sorry to report that due to health issues Jim will not be writing a feature for this issue. As many of you know he has been contributing interesting articles for us faithfully since our early days. That's 28 years and we're very grateful! We wish him well and look forward to reading his columns again in the future. In the meantime we will be running articles from past years.

The chain ferns of the genus *Woodwardia*, comprising some 14 species and a few hybrids are part of the Blechnaceae family which also includes the deer ferns, *Blechnum* with about 220 species, the rasp ferns, *Doodia* with 12 species, the Hawaiian *Sadleria* with 6 species, and the genus *Stenochlaena*, also with 6 species. *Woodwardia* is named after the eighteenth century British botanist Thomas Woodward. The name "chain" fern refers to the imbedded linear sori that superficially resemble sausage links. *Woodwardia areolata* gets its species name from the netted veins and alludes to the space between the veins in reticulate venation. This species is smaller than its giant cousins *W. fimbriata* from far western North America and *W. radicans* of southern Europe, posing a more modest height of 1 to 2 feet. Usually this fern grows close to the coast in eastern

Canada and the United States, ranging from Nova Scotia to Florida and across to Texas. It is much rarer inland, scattered in the eastern states from Missouri to Michigan, always in swampy areas. Acidic bogs and moist marshy wooded areas are to its liking. It tolerates intensely acid conditions and even considerable sunshine. It is found growing close to oaks and near coniferous trees, especially pines. This



Woodwardia areolata - Photo courtesy of Richie Steffen

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species is extremely cold-tolerant, found in Zone 3 but ranging into Zone 9, proving its climatic adaptability. It differs from other cultivated woodwardias in that the sterile and fertile fronds are quite dimorphic. In springtime and early summer, *Woodwardia areolata* may be confused with *Onoclea sensibilis*, the sensitive fern, but the latter has pinnae with wavy edges that are not toothed on the margins. The fertile fronds of the latter, when they appear are very different from *W. areolata*, consisting of contracted pinnules that enclose the spore cases in small round receptacles. In contrast, the fertile fronds of the netted chain fern, though contracted, are open, displaying the chain-link sori.

Description: The blackish rhizome is slender and long-creeping, just below the surface, criss-crossing to form a dense colony. The rhizome sends up fronds at irregular intervals, the fiddle-heads appearing in late spring, densely covered with light brown scales. The stipes are nearly equal to the rest of the frond in length and bear pale brown scales that become more separated as the frond expands. The fronds, both sterile and fertile are a reddish-brown or even pinkish when young, later turning a deeper semi-glossy green. The network of veins, mentioned earlier, can be most appreciated by studying them with a magnifying glass, the well-defined elongated spaces or areoles between the veins aligning along the midrib. Smaller areoles spread outward toward the edge of the pinnae. Sterile pinnae are attached to the rachis by conjoined wings whereas the fertile fronds are attached with a narrow stalk. In considering the dimorphism between sterile and fertile fronds, of interest is a quote from Lellinger; "The fertile-sterile dimorphism in this species is often incomplete, resulting in laminae that are fertile at the apex and sterile at the base." The sterile fronds are ovate-lanceolate to oblong, pinnate at the base but pinnatifid above due to the connecting wing attachments. The pinnae are oblong to narrowly elliptic and somewhat undulate, tapering to a point at the apex and bearing small sharp serrations on the margins that point toward the apex. The fertile fronds are oblong and fully pinnate, the linear pinnae displaying two rows of elongated sori, one on each side of the midvein. The sori are rather inconspicuous when young and as they mature they swell, forming elongated expanded links in a chain. An elongate protective indusium is attached, being free on the midrib side.

Culture: *Woodwardia areolata* is a deciduous fern but the fronds can persist into late autumn if no hard frosts occur. This species can spread, therefore, it should be planted in a large area and perhaps away from more delicate plants that may be overwhelmed. It is very cold hardy to Zone 3 and is at its best in boggy, marshy ground, the soil acidic. With adequate moisture it can tolerate considerable sun. It is possible to grow it in the woodland garden if the soil is always kept damp although the plants will be smaller and not as spreading. Although rather coarse in appearance, it is still quite attractive in mass plantings.

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Book Review

Ancestors in the attic by Michael Holroyd

Pimpernel Press. 2017. Two volumes in single slip case; *My great-grandmother's book of ferns*, 64 pp., and *My aunt's book of silent actors*, 56pp.

Martin Rickard

Tenbury Wells, England

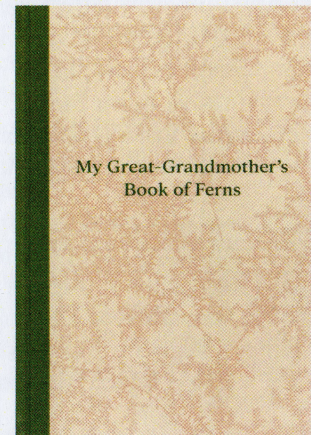
My great-grandmother's book of ferns:

After much toing and froing with Sue, I am with great reluctance sending in this review. I feel it is a rather unethical contribution for me to make because I wrote

the foreword and was instrumental in getting

Christopher Fraser-Jenkins involved. Nevertheless I am the only person with a copy prepared to do it, so here is my account. If you take most things I say with a pinch of salt, so be it!

I should start by saying that Sir Michael Holroyd CBE, FRHistS, FRSL is a very distinguished biographer, acclaimed for in depth biographies of George Bernard Shaw, Lytton Strachey, Augustus John etc. Among many honours the one that most impacts me is that he was President of the Royal Society of Literature from 2003 to 2008. (Source Wikipedia). Embarrassingly when I wrote the Foreword I did not realise Michael was such a distinguished author, by comparison to his text my Foreword is clunky!



The central point of the first part of the double volume is the account by Michael Holroyd of how he discovered an old album of Indian ferns in the attic of his childhood home. The album had belonged to his great-grandmother, Anne Eliza Holroyd. This surprise discovery prompted Michael to look back into his family history. It is a happy/sad story, but not without charm – all instigated by the chance discovery of an album of pressed ferns.

The album contains 21 full page designs created with pressed fern fronds. All are reproduced here and all are beautifully executed and remain to this day in excellent condition. I was approached by Jo Christian, the publisher at Pimpernel Press, to try identifying the ferns. I promised I would have a go but when I saw the scale of the problem I quickly realised I could not do it. With Jo's permission I contacted Christopher Fraser-Jenkins in Nepal to see if he would have a go. For those who do not know, Christopher is British but probably the greatest authority on the ferns of the Indian sub-continent. He quickly emailed back, yes, he'd do it when he returned to Nepal from somewhere in the northern forests of India – fern hunting of course! Subsequently he identified even the tiniest immature fronds on every page. His identifications are clear and will no doubt be useful to any explorer in the region. Christopher did not stop at straight identifications. He often went much further, for example commenting by the specimen of *Dryopteris pulvinulifera* that it is uncommon and grows alongside the Tensing Norgay Road, adding it is visible from the back of a donkey!

Collections of pressed ferns from India were available commercially from a Mrs Jaffrey circa 1880 but privately compiled albums are less common. Certainly private albums to match the quality of this one are rare indeed. Michael Hayward and I are preparing to publish later this year a British Pteridological Society Special Publication entitled 'Fern Albums', featuring fern albums and related publications produced worldwide. Anne Eliza's album, which was compiled in the early 1870s, will feature in India.

My aunt's book of silent actors:

A discussion of this section largely falls outside the remit of the Hardy Fern Foundation, but photographs of the likes of Douglas Fairbanks and Lilian Gish may appeal to HFF members. Anna Eliza died aged 30 in 1880 and the book of ferns appears to have been forgotten until about 1920 it passed to Michael's aunt Yolande. She decided to fill the remaining pages with pictures of silent actors. Quite a contrast!

In conclusion Michael Holroyd's accounts in both volumes are a joy to read. I think it is fair to say that the very high standard presentation and binding matches the standard of Michael Holroyd's text. I just hope my bias towards it and fern albums in general does not invalidate my comments.

Martin Rickard

~Upcoming HFF Classes~

Fern ID class

WHEN: Tuesday, June 12th, 1PM – 3PM, with optional walkabout

WHERE: Bellevue Botanical Garden

COST: \$25.00

Sue Olsen, long-time fern advocate, gardener, and all-around fern expert, will lead a two-hour class into the identification of major fern genera. This class will close at 20 registrants, so reserve your spot pronto!



Summer Photography Workshop

Perfecting Your Smart Phone Garden Photos with David Perry

WHEN: Saturday July 14, 2018, 3-7 pm

WHERE: Private Garden in Medina, Washington

COST: \$100.00



Join us for an afternoon of smart phone garden photography in an intimate and exquisite private garden in Medina.

Nationally-recognized garden photographer, David Perry, will be teaching how to make luscious garden images. He will be working directly with attendees as we explore the garden with the lens of our cameras. He will follow up with a tutorial on how to

enhance your photos once you get them back into your computer. The evening will wrap up with cocktails provided by our garden host and light hors d'oeuvres provided by HFF board members.

There is a limit of 15 registrants for this class so please sign up early to secure a place. Location of the garden will be sent to attendees a few weeks before the class takes place.

REGISTRATION: By mail: HFF, PO Box 3797, Federal Way, WA 98063-3797

Online: <http://www.hardyferns.org/shop.php>

Scroll to the bottom of the page. Enter class ID in the description box, the appropriate amount for the number of reservations you're making, and click the Pay Now button. You'll be re-directed to the PayPal website. You don't need to be a member of PayPal to use this service.

QUESTIONS: hff@rhodygarden.org - 253-838-4646, x 111

(Photos courtesy of Richie Steffen)

A Lush Fernery in Far Northern Wisconsin Part 1

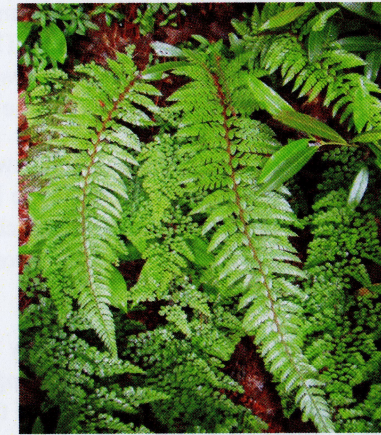
Mike Heim ~ Hayward, WI

Ferns have held a particular fascination for me ever since I was a kid. A friend of the family was a lady who worked for the Field Museum in Chicago. On many a weekend we would join her family on a fossil collecting adventure to the strip mines in northern Illinois where she showed us how to scour the weathered spoil heaps for particular reddish-brown nodules known as concretions. Several carefully-placed hammer blows would cause the stone to split in half, sometimes revealing within a delicately preserved fern frond which had arrived in my eager hands as a time capsule from the lost world of the Coal Age around 300 million years ago. Ever since then ferns have evoked prehistory for me and a longing to see and understand what has been lost for eons. Their fractal patterns also appeal to my aesthetic sensibilities and are also well-suited to being used as a meditative aid in discerning the nature of the universal creative force.

In the late 1970s my family moved from the Chicago suburbs to northern Wisconsin. I immediately fell in love with the northwoods; its lush ferns and clubmosses being familiar friends from my fossil collecting days. Our property, about an hour's drive from Lake Superior, sits atop a kettle moraine where two lobes of the last continental ice sheet ground against one another around 12,000 years ago. The complex topography and soil textures varying within short distances are a horticulturist's dream come true. To the 24 species of ferns, 7 species of horsetails, and 6 species of lycophytes (including all three forms or varieties of the ground pine *Lycopodium obscurum*) already present on our 66 acres, I added many additional ferns from all over the world. Most were grown from spores obtained thru spore exchanges or were collected in little cellophane envelopes during my travels. Snowcover here is generally reliable all winter long, providing a protective blanket not only against cold and desiccation, but hiding plants from hungry deer which human actions have caused to become overpopulated, resulting in ecological havoc. The coldest that we have experienced here was -45F. Up until the year 2000 we were in USDA Hardiness Zone 3b; since then we have moved up a bit to Zone 4a. For ferns and other plants, however, the winters have become *more* extreme, with less

reliable snowcover, although I have yet to lose any completely.

Ferns from the Southern Hemisphere, much to my surprise, have not fared well. I would have thought that ferns such as *Blechnum* originating in the cold southern mountains would thrive here, but they have not proven at all hardy. If anyone out there is growing the hardy dwarf form of *Blechnum penna-marina*, please keep me in mind. I would love to try it in my mossy alpine bed! To my delight, the tree fern *Cyathea australis* did overwinter for two years in a row, but those winters had an early and deep snowcover.



The following are some of my favorite and sometimes surprisingly hardy exotic ferns. Although not native to this region, they thrive here anyway, tolerating whatever Mother Nature has thrown at them for the past decades.

Adiantum venustum, the Himalayan maidenhair. Resembling the tender Venus' maidenhair, this species reaches over 11,000 feet in elevation, growing on cliffs, boulders, and mossy banks. As per its native haunts, it seems to prefer rapidly draining slopes in cultivation. When happy, it will spread to make a delightful groundcover (Photo above with *Polystichum neolobatum*). One winter here saw its evergreen foliage killed-back at -3F, but with full recovery the following year. During another winter it merely sustained some foliage burn after exposure to -5F.

Arachniodes miqueliana, the broad holly fern, is native from Hokkaido south to Korea and China. In Japan it is frequently found growing in sugi (*Cryptomeria*) needle litter in dense shade. Although slow-growing, its foliage has never suffered any winter injury here..

Asplenium scolopendrium var *americanum*, our American hart's-tongue fern. It is fully evergreen and hardy here, unlike the tetraploid European variety which only grows wild in regions affected by the mild Atlantic climate. In the northern U.S. and southern Canada Hart's-tongue fern grows only in well-drained woods on the dolomitic (limestone) margin of the ancient Michigan Basin. In order to successfully culture it here I had to bury broken pieces of concrete beneath it, as plants lacking lime do not survive for long in our acidic soils.

Asplenium septentrionale. (Photo right) Not all of the ferns that I'm growing desire moist woodland conditions. This unfernlike fern wants a sharply-drained, acidic site in sun. I found it growing on a granite outcrop in the



Schwarzwald (Black Forest) of Germany as well as on the face of a sandstone outcrop in the foothills of northern Colorado. The evergreen foliage was uninjured at -21F, but did sustain a bit of injury at -24F. One winter, voles ate the leaves, but the plants recovered well from both this indignity and the cold.

Asplenium viride, the green spleenwort, is endangered in Wisconsin, where it is only found wild on the dolomite of the Michigan Basin. However, it is abundant at high elevations in the Austrian Alps, which is where mine originated. It thrives in a cool, open exposure in my alpine bed. I incorporated some crushed dolomite into the soil to suit its needs.

Blechnum. This genus may be easy for West Coast gardeners to grow, but here in the Midwest the plants are touchy, being quite provenance and site-specific. The Japanese *B. niponicum* typically is found in the wild under beech trees. It does well here on a rhododendron covered slope. *B. spicant*, the deer fern is abundant in the coastal Pacific Northwest where it typically grows in coniferous forests in soil derived from decaying wood. These are not hardy in our region. Mine originated well inland near Germany's border with the Czech Republic. Deer ferns are intolerant of spring drought and of being covered by fallen leaves. Exposure to -5F resulted in no injury to the lovely evergreen fronds.

Cheilanthes. In North America this genus is strictly xerophytic and lithophytic (i.e. loving drought and rocks). Having tried many of these species, I found only two that survive here in the long-term. *C. lanosa*, the unattractive sounding hairy lip fern (Photo right) is native to other parts of Wisconsin where it grows on exposed basalt and sandstone. Unlike many in this genus, it thrives in acidic soils. My *C. wootonii* or Wooton's lip fern was a friend's gift from Colorado. Don't you love it when someone knows *exactly* what to get you?



Dryopteris X australis, Dixie wood fern, is a naturally occurring hybrid between *D. X celsa* and *D. ludoviciana*, both native to the southeastern U.S. It is my largest evergreen fern, reaching chest-height and is unquestionably spectacular. The foliage typically remains evergreen and was uninjured at -8F, but during other winters was killed at -5F and at -11F respectively, although recovering fully.

Dryopteris caucasica, Caucasian wood fern resembles a smaller, denser *D. affinis* and like that species, thrives in our woods.

Dryopteris chinensis, the Chinese wood fern is also native to Korea and Japan. In the latter country it is commonly found growing in the duff of sugi trees. I am quite fond of its lovely finely-cut triangular fronds.

Dryopteris X complexa, is a naturally-occurring hybrid between *D. affinis* and *D. filix-mas* which originated in England. The evergreen fronds can reportedly reach four feet in length. The foliage is partly evergreen to deciduous here and is killed at 0F to no ill effect, thus taking after its male fern parent .

Dryopteris crassirhizoma, the thick-stemmed wood fern is native to the wooded mountains of East Asia from Sakhalin and Manchuria south. It is a species that I am quite fond of, as it reminds me of a miniature tree fern. In the wild it typically forms an undergrowth beneath hardwoods on valley flats, but can also be found locally on wooded mesophytic (rich) slopes, in ash/elm swamps, and even in spruce/fir forests on Hokkaido. Its lustrous evergreen fronds can reach 3.5 feet in length and remain uninjured at -5F (Photo left).



Dryopteris filix-mas, the male fern is native on both sides of the Atlantic, but Europeans have come up with many interesting and unusual cultivars from their version of this species. It grows in any type of rocky woods and prefers a rich soil, although tolerating poor soils and drought better than most other woodland ferns. Here in northern Wisconsin the foliage is always tardily deciduous, remaining undamaged at -2F, but being killed at -4F.

Dryopteris namegatae from Japan and China, although similar to *D. atrata*, is much hardier. The spore from which my original plant grew was an accidental contaminant in a packet of another species' spores from Japan. A fortunate occurrence, as this turned out to be one of the best and brightest of my Asian ferns! (Photo right) The evergreen fronds are a brilliant green and were slightly injured when exposed at -5F.

Dryopteris X separabilis, the separate wood fern, is a naturally occurring hybrid between *D. X celsa* and *D. intermedia*, both of which are native to relatively moist woods in the eastern U.S. The evergreen fronds are fairly robust in both texture and size.

Lygodium palmatum, the climbing or Hartford fern is native to the eastern U.S. as far north as northern New England and as far west as lower Michigan, although it is rare and local throughout most of its range. It is



the only cold-hardy member of this genus, which is widespread in warmer climates. Hartford fern requires a moist, but well-drained acidic soil and is typically found in Nature wrapping itself around seedlings, shrubs, and other ferns in or near openings in the woods. Its twining evergreen fronds do not resemble any other fern. This was the first plant to be protected by law in the U.S., due to its overexploitation for Christmas greens. My plant from central New Hampshire was uninjured at -24F, while the plant from North Carolina was killed-back at -25F (Photo right).



Matteuccia orientalis is another species reminiscent of a small tree fern...or the Jurassic Period. This makes sense because it grows beneath the dawn redwoods in China. It does range all the way from Japan to India. Its large oval deciduous fronds extend outwards horizontally (Photo below).



Osmunda japonica, the Japanese royal fern, also ranges widely, from Sakhalin all the way to the Himalayas. Its deciduous fronds are of a much smaller stature than those of the similar royal fern. In Japan, it is commonly found growing in ash/elm swamps, but does not tolerate wet conditions as



does its larger cousin. Well-drained acidic humus soils suit it best, even in deep shade, as when found growing in forested ravines. It is actually fully hardy here, even though my plant originated on Mt. Omei located in a warmer part of China.

Polystichum acrostichoides, the evergreen Christmas fern, is as tough as nails. It ranges throughout eastern North America to southern Wisconsin. Any well-drained shady site suits it (Photo right). I am particularly fond of a form with wavy pinnae which I found in New Hampshire. None have ever been injured by exposure to cold. Christmas fern dislikes growing beneath paper birch, but does well under sugar maple.

Polystichum aculeatum, the hard shield fern is native to much of Europe where it can be found on shady montane slopes. Chest-tall plants were growing in a fir/hardwood ravine that I hiked within the foothills of the German Alps. Although native on limestone, I find that it is not fussy in this regard as long as the soil is moist and somewhat rich. During one winter here the evergreen fronds were uninjured at -20F. While another winter at -17F killed the foliage, no permanent harm was done.

Polystichum lonchitis, the northern holly fern is considered to be an alpine to subalpine species, therefore needing cool conditions to survive. It thrives here, however, on woodland slopes where summer days can get quite warm. Another frequently stated fact is that it requires lime since in the wild it only occurs on rocks with a basic pH such as limestone and basalt. This has also not been the case here, since it thrives in unamended sandy, acidic soil. My plants originated from spores collected both in the subalpine zone of Montana and the Porcupine Mountains of Michigan, where a colony is growing on a gradual slope beneath windswept sugar maple trees not far from Lake Superior. To me, this is *the* archetypal fern, whose symmetrical evergreen fronds have never been adversely affected by our winter weather.

Polystichum neolobatum, the long-eared holly fern or Asian saber fern, ranges from Honshu, where it is very rare, to India. I once saw a photo of it growing on a mound in a hardwood thicket in Japan. It is a gorgeous fern with its extremely glossy, deeply cut evergreen foliage. Mine arrived as a stray spore in a packet of another Asian species' spores. My plants were uninjured when exposed to -7F, while during another winter their fronds were killed at -8F, but fully recovered in the spring. Elevational ecotypes in China have been found to vary considerably in their cold-hardiness.

Thelypteris novaboracensis, the New York fern, is native throughout much of eastern North America where it may carpet the well-drained ground of acidic woods. This deciduous fern spreads so rapidly that if you don't stand back it will run you over! It is a cheery groundcover for woodlands whose ground is otherwise bare during the summer months. My plants originated from northern New England and vary in their shade of green.

Woodsia polystichoides, holly-fern woodsia, although somewhat resembling its namesake, is fully deciduous. It hails from northeastern Asia. (Photo right). This fern requires a sharply drained acidic substrate in full sun to light shade. The plants are covered in tiny hairs or trichomes which reflect intense sunlight and also help to prevent water loss. As is the case with other xeric rock ferns, it will shrivel to a crisp when dry, then resurrect



rapidly and completely when it rains. Mine are growing in pure glacial sand between the boulders of a retaining wall which faces south. While dormant, this species remained uninjured when exposed to -31F.

Woodwardia areolata, the netted chain fern, is found in moist to wet acidic woods and sometimes sandstone outcrops throughout much of eastern North America. The deciduous fronds may perhaps be mistaken for those of the sensitive fern. Mine is growing in a wet site by a creek.

Woodwardia virginica, the Virginian chain fern, has a natural range similar to that of the aforementioned species, but is typically found in open sphagnum bogs. Although the deciduous fronds resemble cinnamon fern, the plants do not form tufts, but instead send up leaves along the creeping rhizomes. These rootstocks spread faster than a sack full of snakes dumped upon the ground! Hyperbole aside, it does make a most attractive vista in bogs with its associated heath shrubs and carnivorous pitcher-plants. My plants originated in a New Hampshire bog and find my Wisconsin bog entirely to their liking.

Watch for Part 2 – natives – which will appear in a future issue.

Excellence at the Philadelphia Flower Show

Editor I had the pleasure of visiting the Philadelphia Flower Show in March. The theme this year was Wonders of Water and was amazingly beautiful. I especially enjoyed the outstanding Enchanted Woodland Wedding exhibit which deservedly won the Best of Show Award and featured spectacular displays of ferns. It was created by Robertson's Flowers and Events and they kindly provided the following details describing the design and care of the exhibit. Reported here with our thanks.

Our exhibit for Wonders of Water was inspired by a trip that our lead exhibit designer, Emanuella Williamson, took to temperate rain forests in Alaska and Olympic National park in Washington. We decided to create this in the context of a woodland wedding to help bring color and flowers into our space as well as to promote the Wedding and Event services that we provide.

Our space was 48' by 42'. To help create



height we built a living wall with over 600 plants. This was sloped on one side to give the feeling of the gentle and rolling landscape of a lush temperate rain forest. We also used this to separate the reception area of our “wedding” from the cocktail area. The wall was 10' tall, 28' long and 6' wide.

The other side of the wall was vertical and served as the backdrop for the cocktail area. We made 70 squares of 2x2' and covered them with birch disks, fern printed fabric, burlap, green moss, brown branches and white raffia inspired by all the materials we used on the other side of the wall – it was fun to see this become a “selfie spot” during the exhibit.

The cocktail area had 6 high top tables made from slices of a large tree trunk. Each of these featured a terrarium and candles and had an 18” Alabaster ball accented fairy lights and Phalaenopsis orchids hanging above it.

The “ceremony” had a pond in the background which we were able to create from a pool we recycled from our exhibit in last year’s Flower Show. (We used it for our Dutch canal in 2017). This pool was 12' by 28'. We also hired a lighting company who provided special water lighting to make it look more mystical.

The rain feature was made out of PVC pipes and attached to a truss above the pool. The pool had a pump in it which pushed the water up 16' through a hose hidden in the wall to feed the rain feature. The water was set on a timer to fall 50 minutes of every hour.

Another item that was recycled from a previous Flower Show was the chandelier above the head table. We reused dozens of pieces of grape wood that had been used to create an arch for our ‘100 Years of National Parks’ exhibit in 2016. We affixed all of these pieces together to make a 9' long chandelier which hung from a truss above the fabulous tree root table.



We filled the wedding arch with flowers such as Phalaenopsis orchids, hydrangeas, and roses and accented them with air plants, succulents, ferns and mosses. This is an arch we custom made and have used for many weddings over the years.

The wedding aisle was 18' long and made out of sliced birch disks.



We created large arrangements to feature throughout the exhibit – in these we used lots of textures and natural elements such as air plants, Phalaenopsis orchids, lady slipper orchids, ranunculus, hydrangeas, ferns succulents, etc.



We accented most features of our exhibit with green sheet moss, clump moss and Spanish moss. We also had branches covered with lichen and live roses shipped from Oregon a few days before the show started – these were wonderful authentic additions to our exhibit in helping to portray our vision of a temperate rainforest.

The perimeter of our exhibit was filled with interesting terrariums, plants and arrangements raised by lots of tree stumps, logs and wooden disks. The rest of our floor space was covered by 6 different kinds of ferns – we probably used close to a thousand plants in our exhibit.

We started to plan our exhibit in July and started creating items in January. A week prior to the Flower Show we set up Monday through Thursday from 8 AM until 6 PM. The flower arrangements were made on Wednesday and delivered and set up on Thursday. Maintenance was every night from 9 until 11PM to water and change flowers. We replaced all the flower arrangements one night mid-week and replaced the arch flowers almost every night to keep them fresh.

Photos are courtesy of Robertson's Flowers and Events, Glenside, PA

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48-Spring 2018

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GIVEBIG Seattle is a one-day online giving event to raise funds for nonprofit organizations serving Greater Seattle.

When is GIVEBIG 2018?

GIVEBIG 2018 is Wednesday, May 9 from midnight to midnight Pacific Time.

What is the GIVEBIG url?

GIVEBIGseattle.org

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