The New York Chapter of the American Fern Society again joins with the New York Botanical Garden to put on a Fern Festival May 12 and 13. In addition to an outstanding sale of living ferns (including hardy ferns, house ferns, miniatures, and rarities), there will be demonstrations on growing ferns from spores, mounting staghorns, and tissue culture. Special lectures by F. Gordon Foster (northeastern Ferns), Barbara Hoshizaki (staghorns), and Virginia Ault (wall ferns) will be presented May 12. Hardy ferns can be viewed in the Rock Garden and Native Plant Garden, while the main showpiece is the Fern Gallery in the renovated Conservatory, which contains the finest living indoor fern collection in America and one of the best in the world, with over 400 kinds of ferns and fern allies in a setting of rocks, pool, and waterfall.

Name Changes in Common Ferns and Fern Allies

One of the pet peeves of amateur botanists is the apparently endless changing of the botanical names by the professional botanists. If it is any consolation, there is reason behind the changes in an attempt to bring eventual stability to the names. The basic principle is that the oldest name for the species or variety must be used. However, through oversight or misinterpretation the commonly used name is not always the oldest, and when the older name is uncovered, it must displace all others. This is especially disappointing when it happens to a common species, and two such cases have recently been brought to light.

In a recent issue of Rhodora (Vol. 81, pp 137-140) R. James Hickok and Joseph M. Beitel have pointed out that just as everyone is accepting Lycopodium flabelliforme as a distinct species in northeastern North America, there is an older name for it—Lycopodium digitatum A. Braun.

Causing even more widespread grief, the marsh fern, which has nearly worldwide distribution, is no longer to be called Thelypteris palustris but rather Thelypteris thelypteroides (Michaux) Holub. Until recently botanists thought this name applied to T. novoboracensis, the New York fern, and since it was a more recent name than T. novoboracensis, it did not have to be considered. Unfortunately for us, Michaux's plant was really the marsh fern and his name is older than T. palustris so must be used in its stead. Thus progress marches on.

Updated Constitution

The Constitution of the American Fern Society was last printed in the FIDDLEHEAD FORUM three years ago, but in the meantime several changes have been made and many new members have joined. For the benefit of all, we have printed the up-to-date version in this issue.
Quillworts, so called because the leaves of many species have a fanciful but striking resemblance to porcupine spines or quills, are fascinating and unusual pteridophytes. The tufted, quill-like or rush-like leaves look anything but fern-like and resemble certain monocots enough that in 1754, Linnaeus described Quillwort "flowers" as incomplete and solitary, its "fruits" as capsules, and its "seeds" as globose.

The family Isoetaceae, to which all Quillworts belong, contains only two genera, *Isoetes* and *Thalassia*. There are probably more than 50 species of Quillworts, but the actual number is not known with any certainty since plants are easily overlooked in the field and the taxonomy of the family is not completely understood. In fact, some workers do not think that *Isoetes*, represented only by two taxa in the high Peruvian Andes, is distinct enough to be a genus separate from *Thalassia*.

The generic name *Isoetes* comes to us from the Greek *iso*, equal, and *eutes*, year, or "equal throughout the year", alluding to the evergreen character of some species. The genus is of worldwide distribution but nearly a third of the known species are found in North America.

Quillworts are found in a variety of habitats. Some species are totally aquatic and grow in lakes and streams submerged in several feet of water; others are more or less amphibious and are found in shallow water of temporary pools and ditches or on the dried out margins of ponds. Lakes and streams, still others occur in only seasonally moist, thin, soil pockets that overlap various types of rock slabs.

The clustered, linear leaves of most species arise from a thick, clubbed corn while others appear to be more or less rhizomatous (Fig. 1). Whatever its growth form, the underground rootstock of a Quillwort is a remarkable structure among the pteridophytes because it produces wood tissue and is covered by bark! A round to elliptical sporangium or spore case up to one centimeter long is located toward the broadened base of each leaf (Fig. 2). The outer wall of the sporangium may be more or less covered by a flap of tissue called the velum. Just above the sporangium is a small, flat, generally triangular ligule.

Quillworts are heterosporous, meaning they produce spores of two different kinds. A sporangium may contain up to several hundred large megaspores or several hundred thousand much smaller microspores. The globose megaspores vary in size from 1/4 to 1 millimeter diameter depending on the species. The football-shaped microspores are dust-like and only about 20-45 microns in length. The outer walls of both kinds of spores bear some sort of ornamentation: bumps, knobs, spines, ridges, etc. (Fig. 3).

Most species of Quillworts are monocious, meaning that a single plant is capable of producing both kinds of spores.

Fig. 1. Plant of *Isoetes*, ca. 3/4 life size

Normally a plant will produce mostly megaspores early in the growing season and microspores later in the year. A few species appear to be dioecious, in which case a single plant will produce only megaspores or only microspores.

Under the proper environmentally conditions spores will germinate shortly after being shed from the sporangium, but the required combination of temperature and moisture usually is not met until the following growing season. Gametophytes of temperate species may be easily cultured by collecting soil from around the base of plants during the winter. Spores from the previous growing season will more than likely be present in the material. Gametophytes will develop after about two weeks if the soil is kept wet and warm.

Fig. 2. Adaxial view of leaf base, ca. 3X

Fig. 3. *Isoetes* spores: left, megaspores, ca. 37X
right, microspores, ca. 375X

The gametophytes of *Isoetes* are small and develop for the most part within the confines of the spore wall. In this sense they are sometimes referred to as being endosporic. Upon germination, the megaspore wall ruptures to expose a cushion of gametophyte tissue which bears several archegonia, each of which contains an egg. The male gametophyte, composed of only nine cells, develops entirely within the microspore. Four multihedral sperms are released when the microspore wall cracks open. Union of a motile sperm with an egg produces a zygote which eventually grows into a sporophyte possessing the characteristic spore bearing leaves and corn of a Quillwort. It is evident that Quillworts and ferns have similar life cycles, and this is why Quillworts are considered to be fern allies.

Species of Quillworts have been distinguished from one another using characters of habit, leaf, ligule, velum, sporangium, and size and ornamentation of the spores. Unfortunately, these features appear to be too variable to clearly distinguish many of the species. Future biosystematic studies on the Isoetaceae will very possibly result in a major revision of the genus.

Although Quillworts are not often found in cultivation, their apparent simplicity of form and uniqueness among the pteridophytes should make them attractive horticultural subjects. The aquatic species can be grown quite successfully in aquaria, although they are relished by some species of fish. The terrestrial species are easy to grow if the soil is kept saturated in the spring, when plants are actively growing, and then is allowed to dry out as the plants become dormant in summer. Temperate plant should also be stored in a cold place for several weeks during winter to give them a good rest before renewing growth in late winter.

Dr. Carl Taylor is curator at the Milwaukee Public Museum, and has made extensive studies of *Isoetes*.
Nephrolepis in Cultivation
An Interim Report

As is well known, the classification and correct naming of Boston fern cultivars is a real mess. We are trying to improve this situation at the New York Botanical Garden. In the last two years we have been collecting cultivars (and species) of Nephrolepis with the eventual goal of putting correct names upon all these plants. To do this, we have studied the collections made by R.C. Benedict on deposit at the Bailey Hortorium at Cornell University and collections made by Barbara Hoshizaki and housed at the herbarium of the University of California-Los Angeles.

We have made significant progress and have confidence in the tentative names we are presently using. Our study is about half over, but we need help in obtaining living plants of cultivars that are not presently in our collection and hence have not been studied or compared to the earlier specimens of Benedict. Thus, we present the following lists: the first is cultivars in our collection with the names we are currently using; the second list is cultivar names for which we have no living plants. We ask that anyone who possesses a plant with a name that appears in this second list contact us so that we may obtain at least a good specimen and, if possible, a living plant. We are very willing and able to exchange any plant presently in our collection for any plant(s) not in the collection. We urge horticulturists who have introduced new cultivars in the last 15 years to send us such plants so that it may be compared with other cultivars and its correct origin documented. With such help, it seems possible to have a monograph of the Boston fern cultivars ready for publication during 1980. We urge anyone who visits the New York Botanical Garden to bring any new or curious cultivars along to us, and we invite you to come and discuss our current names and see our large collection in the NYBG Conservatory.

Andrea Sessions and Bruce McAlpin

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FERN FORAYS

"It sure looks like Maidenhair to me."

-3- New York Botanical Garden

Nephrolepis Collection

Species:

Nephrolepis acuminata
N. cordifolia
N. davalliioides
N. exaltata
N. falcata
N. hirsutula
N. luteaerbachii
N. multiflora
N. occidentale
N. pectinata
N. pendula
N. rivularis
N. saligna

Cultivars:

N. cordifolia "crested"
N. cordifolia cv. Dennis Petticoat
N. cordifolia cv. Duffii
N. cordifolia cv. Plumosa
N. exaltata cv. Bostoniensis
cv. Childsii
cv. Craigii
cv. Dwarf Boston
cv. Floppy Ruffles
cv. Golden Boston
cv. Hillii
cv. Marshallii-Compacta
cv. Norwoodii
cv. Scottii
cv. Splendide
cv. Superbissima
cv. Teddi Jr.
cv. Todeoides Superba
cv. Verona
cv. Wagner
N. falcata cv. furcans
cv. Wahanaka
N. rufescens var. pinnatiftida

Nephrolepis exaltata

Cultivars lacking at NYBG

-1-

Twice Pinnate:
Barrowsii
Colorado
Elegantissima
Elegantissima-Compacta
Florida Ruffles
Moundi
Moundii
M.P. Mills
Plersoni
Robusta (Brevio, Minerva)

More divided:
Elmsfordii
Emerald Fleece
Fertiliis
Gracillima
Irish Lace
Magnifica
Muscosa
Pulcherrima
Smithii
Superior
Trevisillan
Whitmanii-Compacta

WHO’S WHO IN PTERIDIA

William Wilson of Warrington, a town in Lancashire, England, was an assiduous botanist who added several species to the British flora. His "Bryologia Britannica" was for many years the standard work on British mosses. His collection of mosses became a treasured part of the Botanical Department of the British Museum. Hymenophyllum Wilsonii was named by Sir William J. Hooker in his honor, thus establishing the plant as distinct from. H. conizaeum which Wilson had pointed out in 1829 when he had discovered both ferns growing together in the rocky woods bordering the Upper Lake of Killarney in Ireland. Wilson died in 1871.
Fern Names
from Alpha to Omega

ASPLENUM

For those who don't know, the generic name of Asplenium comes from the Greek, ASPLENEIA, meaning 'without a spleen'; the prefix 'an-' implying 'without' is here reduced to 'a' before the consonant. The word spleen comes to us directly so that it is not surprising that the equivalent English for this fern family is 'spleenwort'. The 'wort' part comes from Medieval English, derived from the Anglo-Saxon 'wyrt', a term frequently applied to a plant with medicinal properties. Just how effective are the Asplenium in shrinking spleens is a moot question but the name was originally applied by Dioscorides and his reputation concerning medical matters was great enough for the name to become established before the efficacy came into question. It was first applied to the Scale Fern or Rusty back, names which are surely self-explanatory; today we know it as Ceterach officinarum.

A momentary digression - the word Ceterach is from the Arabic for 'spleen', Cotherak, and Officinarum is the Latin for 'of the apothecaries' (pharmacists). The Cretan swine were said to lose their spleen altogether when feeding on it, and it was believed that when taken in excess the same injury (?) was experienced by humans.

Why just Cretan swine?...Well, on the island of Crete, on one side of the river Porterius, the flocks and hordes were found without spleens, while on the other side where there was no Ceterach, they had spleens. Interesting if true.

While still on the Ceterach trail, it was known also as Finger fern and Miltwaste; the former name from its approximate size and spleen shape, a fine example for the proponents of the doctrine of signatures; the latter, a consequence of 'milt' being an Old English word for the spleen, and 'waste away' was just what it was supposed to do to the spleen. A couple that dates back to the year 1611 ran as follows:

"The Finger Fern, which being given to swing, It makes their milt to waste away in fine."

Having dealt with origins of the generic name we now come to the epithets.

To discuss all the name origins of the Asplenium is a bit of a tall order and somewhat beyond the scope of our present investigations, and since many literal translations of the Latin epithets are descriptive characteristics of the species name, the origin is self evident. However some names are of particular interest and these will be brought out of a latent obscurity and subjected to the spotlight of intellect (?) For instance:

'septentrionalis' is found to be from the Latin septem-entricularum, seven plough oxen. The first definition however is Ursa Major, The Dipper, the one circumpolar constellation of stars with which almost everyone in the northern hemisphere is familiar. This might satisfy the less inquisitive, but we're still curious about how the seven plough oxen got into the act. It required some 'digging' but we finally unearthed some interesting facts. The origin of the word is a bit obscure but it has a long history dating back to the Romans. The circumpolar constellation was known as Ursa Major, the Great Bear - at least the legend of Callisto's compassionate metamorphosis into a bear to escape the jealousy of Juno dates back to Hesiod - eighth century B.C. - but the seven stars we call the Dipper were also known as the Main, or wagon. Homer refers to it in the Odyssey: 'The Great Bear, by others called the Main'. This leads us into more confusion about the 'Main'. This was originally careless-main, a peasant's cart, and it's derived from the Anglo-Saxon word cuoer, recognizable today as 'churl'. But other variations have it referring to Charlemagne. Each proponent says the other's wacky so you can take your choice.

It doesn't take too much imagination however to understand how the seven bright stars of Ursa Major, the Great Bear, made a transition from a peasant's cart to a plough. Indeed the Dipper has been called the Plough and Charles's Main in England for centuries.

Further delving disclosed that the seven bright stars that form the Great Bear have had various labels - the Seven Shiners, Seven Sages, Seven Wise Men, Seven Sleepers, Seven Bears, Seven Bulls, Seven Antelopes and of course, the Seven Plough Oxen, to mention a few. Even in prehistoric India they were known as the Heavenly Plough.

To quote our source, it's "With the Main and Plough naturally came the Plough Oxen, the Triunes of Varro, Aulus Gelius and the Romans generally, turned by grammarians into Teriones, the Threshing Oxen, walking around the threshing floor of the Celestial Pole." Varro and Gelius were Roman scholars of the first century B.C. and the second century A.D. respectively.

One of the earliest specific uses of the term Septentrionalis comes from Cicero, the Roman philosopher and statesman. In the English language however, Chaucer seems to be first, using the term as a compass-point, the beginning perhaps of its more general usage as 'northern'. Later Dante used it in reference to the constellation Ursa Minor. Gradually its meaning from a polar star group or groups changed, first to the North Pole, then to the North Wind and finally merely to the North.

If you are of the opinion that we have wandered far afield in search of fern roots, and coils, but the epithet septentrionalis is to be met botanically everywhere then. It should no longer be a mystery.

1. "European Ferns" by James Britten, Cassell, Petter, Galpin & Co.
2. "Star Names and their Meanings" by R. H. Allen, Publisher G. E. Stechert, New York, 1899

Article I: Name.
Section 1. The name of this society shall be The American Fern Society, Incorporated.

Article II: Objects.
Section 1. The objects of the Society shall be to affiliate those who are interested in the study of ferns and allied plants, to foster such an interest, to encourage correspondence and exchange of specimens between the members, and the presentation of papers pertaining to this group of plants.

Article III: Membership.
Section 1. Any person interested in the objects of the Society shall be eligible to membership. Libraries, businesses, and other institutions are not eligible for membership in the Society but may subscribe to Society publications upon payment of annual fees fixed by action of the Council.
Section 2. The admission fee shall be payable when application for membership is made. This fee shall also constitute the dues for the first year of membership.
Section 3. The annual dues shall be payable by January first of each year and shall be fixed by action of the Council.
Section 4. Regular members in good standing shall be entitled to all the privileges of the Society, except the receipt of the American Fern Journal.
Section 5. Journal members in good standing shall be entitled to all the privileges of the Society, except the receipt of the American Fern Journal.
Section 6. Life members shall be entitled to all the privileges of the Society, including the receipt of the American Fern Journal, upon payment of a one-time fee of twenty times the amount of the journal membership dues, and shall thereafter be subject to no dues or assessments. All such fees shall be held and invested as a permanent fund, the principal of which shall not be expended during the member's lifetime, but the income from which shall be expended for the further increase of the objects of the Society at the discretion of the Council or which may be used for other purposes at the discretion of the Council.
Section 7. Honorary members shall be entitled to all the privileges of the Society, including the receipt of the American Fern Journal, upon election to honorary member status, and shall be subject to no dues or assessments. Honorary members shall be unanimously nominated and placed on the annual ballot by the votes cast on the question. The number of honorary members shall not exceed ten at any one time.
Section 8. Members who have not paid their dues by March 1 of any year shall be considered not in good standing and shall forfeit all privileges of the Society including its regular publications. Any such member may be reinstated at any time after that year by the payment of arrears. However, the Council shall have the power to rescind any dues for reasons which it considers sufficient.

Article IV: Officers.
Section 1. The officers of the Society shall be a President, Vice-President, Secretary, and Treasurer. Their term of office shall begin January first, and shall be for two years. Election of the Secretary shall be in even numbered years and the election of other officers shall be in odd numbered years.
Section 2. The President shall be in immediate charge of the general interests of the Society; he shall appoint all committees not otherwise provided for, and shall report annually to the Society. As the need arises, he shall appoint and the Council shall confirm a Records Treasurer, who shall receive dues and subscription monies for forwarding to the Treasurer, shall oversee maintenance of the mailing list, and shall keep an official list of members. On or before December 31 of each year, he shall appoint one who is not an officer, and need not be a member of the Society, who shall audit the accounts of the Treasurer who shall send such reports to him as soon after the close of the year as possible.
Section 3. The Vice-President shall act in the absence or disability of the President. He shall also act as Program Chairman for the annual meetings of the Society.
Section 4. The Secretary shall keep the records of the Society, and shall conduct the correspondence pertaining to his office. He shall keep all money received and shall report annually to the Society.
Section 5. The Treasurer shall receive and hold all monies belonging to the Society subject to the direction of the Council, receipt for dues, pay bills when approved in the manner prescribed by the Council, make an annual report to the Society, and at the end of his term of office shall deliver to his successor all money and other property of the Society in his possession. At such times as the Council shall direct, he shall furnish the Council with a statement showing his financial transactions since the date of his previous report, any outstanding indebtedness, the cash balance in hand and such other integral facts as shall enable the Council to know clearly the financial condition of the Society at the time. He shall close his accounts for the year promptly as of December 31 of each year, and as soon as practicable thereafter shall place in the hands of the Auditor such records, vouchers, etc., as shall make possible a proper auditing of his accounts.
Section 6. The unexpired term of any office shall be filled until the ensuing election by appointment by the Council.

Article V: Council.
Section 1. The President, Vice-President, Secretary, Treasurer shall constitute a standing committee to be known as the "Council."
Section 2. The Council shall have general charge of the affairs of the Society; of its publications and property; shall have power to expend the Society's money and to act upon all questions not requiring a vote of the Society.
Section 3. No funds according to the Society may be paid any individual as expenses as directors or otherwise.
Section 4. In case of dissolution of the Society the Council shall have the power to distribute the assets of the Society in conformity with the laws which govern its incorporation, providing that such distribution be made to non-profit plant science societies of national scope incorporated within the United States of America.

Article VI: Elections.
Section 1. Before the first day of September of each year the President with the approval of the Council shall appoint a nominating committee, consisting of a chairman and two other members, none of whom shall be an officer of the Society.
Section 2. This committee shall nominate officers for the ensuing year and forward the list of nominees to the President before October first. Any other nominations, if received by members in good standing and received by the Secretary not later than October first, shall be incorporated in the ballot for that year.
Section 3. The President shall by October first, have each member consider whether he is interested in the Society and whether he is not a candidate for office to act as Judge of Elections, and shall forward his name to the list of names to the Secretary.
Section 4. The Secretary shall before November first, send to each member of the Society a notice of the election, giving a list of the nominees and the name and address of the Judge of Elections, to whom each member shall send his ballot.
Section 5. Balloting shall begin November first and end December first. Immediately after election the Judge of Elections shall send to the Secretary a true statement of the ballots cast and shall send the ballots to the chairman of the nominating committee. The candidate receiving the largest number of votes shall be declared elected, and shall be notified of his election by the Secretary. In case of a tie the nominating committee shall cast the deciding vote and shall notify the Secretary of its action.

Article VII: Amendments.
Section 1. Proposed amendments to this Constitution must be presented to the Secretary in writing before October first, signed by three members. The Secretary shall publish all proposed amendments. After the close of the meeting of the next annual election and they shall be voted upon at that election. If two-thirds of the votes cast for any proposed amendment are in favor of its adoption, and provided that not less than one-third of the votes cast be in favor of its adoption, the amendment shall be declared adopted.
Fern Fun
Our Potpourri of Pteridological Trivia

Starting at any selected square and moving in any direction to an adjacent square, 40 of the 55 named genera may be spelled out. Letters may be used more than once but not repeated consecutively. Check them off as you find them. Time limit: Receipt of next issue.

Answers: Starting Squares

Dr. John T. Nickel
New York Botanical Garden
Bronx, New York 10458

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