

TORREYA

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✓ THE EARLY WRITERS ON FERNS AND THEIR
COLLECTIONS.—I. LINNAEUS, 1707-1778

BY L. M. UNDERWOOD

A little two-volume leather-bound book bearing on its title-page the words, *Species Plantarum*, 1753, has now become quite rare from the demands made since the Berlin, Rochester, and Genoa decisions of 1892 made it the starting point of botanical nomenclature. Many people still hold the erroneous opinion that Linnaeus was the originator of binominal nomenclature. The first book to figure American ferns was published in 1635,* nearly a hundred years before Linnaeus published a line, and gave illustrations and descriptions of two of our American species, calling them *Filix baccifera* and *Adiantum Americanum*, names which by right they should bear instead of those adopted a hundred and eighteen years later by Linnaeus. The same work included many other binomial names some of which, like *Asaron Canadense*, are the names the plants still bear. In *Species Plantarum* Linnaeus simply brought together in a compact and usable form a condensation of the enormous mass of botanical publication that preceded him and reduced the whole to a system which though artificial is readily accessible, which fact has invested his volumes with an importance perhaps greater than that of any other single botanical work.

The ferns and fern allies of Linnaeus were grouped under two of the major divisions of his *Class XXIV. Cryptogamia*, FILICES and MUSCI; the genera recognized, with the number and distribution of species may be seen from the following table:

* CORNUT. *Canadensium plantarum* * * * *Historia*. Paris, 1635.

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Genera	Total Species	Europe	Asia	Africa	Temperate America	Tropical America	Common to U. S. and Europe
<i>Filices.</i>							
EQUISETUM.	6	6	—	—	—	—	—
ONOCLEA.	1	—	—	—	1	—	—
OPHIOGLOSSUM.	6	2	2	—	—	2	—
OSMUNDA.	17	5	1	—	4	8	—
ACROSTICHUM.	25	5	6	3	3	10	—
PTERIS.	19	1	3	—	1	15	—
BLECHNUM.	2	—	1	—	—	1	—
HEMIONITIS.	2	—	—	—	—	2	—
LONCHITIS.	3	—	—	—	—	3	—
ASPLENIUM.	20	9	2	—	1	10	—
POLYPODIUM.	58	15	9	—	5	29	2
ADIANTUM.	15	1	3	1	1	9	—
TRICHOMANES.	11	2	3	2	—	6	—
MARSILEA.	2	2	—	—	—	—	—
PILULARIA.	1	1	—	—	—	—	—
ISOETES.	1	1	—	—	—	—	—
<i>Musci.</i>							
LYCOPodium.	24	9	7	—	6	4	1
Total.	213	59	37	6	22	99	3

While the above will show that the genera outlined by Linnaeus are commonly recognized genera of to-day, the sense in which he conceived them was far different from our present conception except in the case of the genera *Equisetum*, *Onoclea*, *Blechnum*, and *Adiantum*, which were composed wholly of species still within those genera as now accepted. *Ophioglossum*, based on the familiar adder-tongue fern of Europe, which had been known as *Ophioglossum vulgatum* at least since the publication of Bauhin's *Pinax* (1671), also included the tropical *Cheiroglossa* and two Asiatic species of climbing ferns (*Lygodium*). *Osmunda* was still more of a mixture and included nearly everything known to Linnaeus which had a semblance of a panicle, although the royal flowering fern common in Europe was clearly the historic type of the genus. The genus *Osmunda* of Linnaeus contained what are now distributed among four families representing two distinct orders of plants, viz. : *Helminthostachys* and two species of *Botrychium* (OPHIOGLOSSACEAE); four species of *Ornithopteris* and *Anemia* (SCHIZAEACEAE); four species of *Osmunda* proper (OSMUNDACEAE), one species each in *Matteuccia*, *Struthiopteris*, *Olfersia*, and *Cryptogramma* (POLYPODIACEAE) besides one tropical American species not yet identified.

Acrostichum as outlined by Linnaeus contained ferns having the sporangia scattered in a layer over the under surface of the leaf, and in separating the members of this group, he did not distinguish those which have distinct sori when young which later become confluent. Without these his genus formed a sufficiently unnatural group, containing as it did species of *Schizaea*, *Danaea*, *Stenochlaena*, *Ceratopteris*, *Hymenodium*, and *Todea* in addition to *Acrostichum aureum*, the type of the genus, and to these were added *Polypodium polypodioides*, *Asplenium platyneuron*, *Asplenium septentrionale*, *Lorinseria areolata*, *Woodsia Ilvensis* and *Dryopteris Thelypteris* by way of variety, together with species of *Notholaena*, *Trismeria*, and *Ceropteris*. Should anyone suppose that the fern system of the miscalled "Father of Botany" was anything but crude even for the time at which it was proposed, the contemplation of this array of misfits should serve as convincing evidence to the contrary.

The genus *Pteris* in the *Species Plantarum* is a little better although it contained members of the genera *Vittaria*, *Notholaena*, *Gymnopteris*, *Dryopteris*, *Pteridium*, *Dicranopteris*, and *Pellaea* as now recognized, in addition to species which still help to make up the genus *Pteris* with a single continuous marginal indusium and free veins. *Asplenium* was a somewhat more natural aggregate commencing with the single-leaved species of *Camptosorus*, *Phyllitis*, and *Thamnopteris*, and passing on to *Ceterach* and the more divided members of the genus *Asplenium*, now distributed among several genera but, with perhaps a single exception, all members of the tribe *Asplenieae* as now recognized. A serious relapse occurred again in *Polypodium* which included all the species with rounded sori whether indusiate or not; besides representatives of the various genera still included under *Polypodium* in certain quarters, *Polypodium* of *Species Plantarum* contained species of *Tectaria*, *Polystichum*, and *Phegopteris* together with *Asplenium fontanum*, *A. filix-foemina*, several species of *Dryopteris*, including *D. filix-mas*, *D. cristata*, *D. Noveboracensis*, and *D. marginalis*, *Filix bulbifera* and *F. fragilis*, *Cibotium Barometz*, *Cyathea arborea*, *Hemitelia horrida*, *Alsophila aspera*, and others equally diverse in character.

The genus *Trichomanes* whose name Linnaeus transferred from our little tufted spleenwort to the tropical filmies, included some species of *Hymenophyllum* and at least one *Davallia*. *Marsilea* included *Salvinia natans* and *Marsilea quadrifolia*, now recognized as types of two different families of the *Salviniales*, and *Pilularia* and *Isoetes* were monotypic, each including the more common species of northern Europe.

It was perhaps natural for *Lycopodium* with narrow leaves to have been associated with the leafy mosses under MUSCI, but it was strange that the foliose hepatics with the single exception of *Porella* should have been placed apart under ALGAE. The genus *Lycopodium* of *Species Plantarum* contains twelve species still included under the genus, together with *Psilotum nudum* and eleven species of *Selaginella*.

It is highly improbable that Linnaeus knew many of the pteridophytes which he arranged in this work, save the few with which he was familiar in northern Europe. By far the greater number of his species were compiled from books and his only knowledge came from the more or less accurate illustrations with which he was familiar.

The apparently undue proportion of tropical American species was due to the early works of Plumier and Sloane, which had been copied by Petiver and probably by Plukenet. Sir Hans Sloane collected extensively in Jamaica toward the close of the seventeenth century, and Charles Plumier collected in Santo Domingo and Martinique at about the same time. The elaborate folio works of these two early writers form the foundation of our knowledge of West Indian botany, and while they were digested by Linnaeus only in part, they furnished him the basis for his species of West India ferns. Later writers have traced many additional species to the same early sources that Linnaeus only skimmed, but did not fathom or comprehend.

Linnaeus' herbarium was probably made, at least in great part, after the publication of the first edition of *Species Plantarum*, and on that account is of comparatively little value for the determination of his types. It is preserved at London in the rooms of the Linnaean Society. After the death of Linnaeus' son, the collection

reverted to the widow of Linnaeus by whom it was sold to Sir J. E. Smith, for many years president of the Linnaean Society. After Smith's death it was purchased with other collections for the Linnaean Society at a sum that almost paralyzed the society for a quarter of a century. The plants are in an excellent state of preservation and are on sheets about the size of small foolscap paper. The sheets of each genus are protected by heavy wrappers which entirely enclose the packets; the genera are systematically arranged in the original cases in which Linnaeus left them, protected by clumsy Swedish locks, and these cases are again placed in others still larger with glass fronts which stand in the assembly room of the Society.

During the past summer we examined the plants of the genera *Osmunda*, *Acrostichum*, and *Polypodium* and found the material scrappy, often consisting of mere tips of leaves, rarely with any rootstocks, and often wholly sterile. Only a small part of his species are represented by specimens at all, and those that are often do not correspond with the species described in his works. Two instances will show the nature of the discrepancies:

Under *Osmunda Lunaria* (= *Botrychium Lunaria*) the only plant preserved is one of *Botrychium matricariae*.

Under *Osmunda bipinnata*, a West Indian species described from Plumier's plate which represents a very close ally of *Osmunda cinnamomea*, the only plant is one of *Ornithopteris cicutaria* (Kze.), a plant bearing no resemblance to Plumier's plate! Moore, who made this same discovery, promptly transferred *Anemia cicutaria* Kze. to *Anemia bipinnata* (L.) Moore and the name was as promptly adopted in *Species Filicum* at Kew for this species, a proceeding that cannot hold for manifest reasons. The types of Linnaeus must very largely depend on the plates and descriptions of the early writers from which he quoted. Of these there are twenty-seven works containing descriptions of extra-European ferns from which Linnaeus made citations, to say nothing of thirty-five or more European herbals which were also cited. Considering the number of ferns named by Linnaeus, his original contribution to the knowledge of them was very limited, although he did describe a few species from plants collected by

Kalm in America and by Osbeck in China, and he must ever plead guilty to the charge of needlessly changing names already given by his predecessors.

A NOTE ON THE "FLOWERING" OF THE LAKES IN THE ADIRONDACKS

BY MARSHALL A. HOWE

In the spring of 1902, Mrs. Annie Morrill Smith, of Brooklyn, sent me for determination a small alga, which in the very full notes accompanying the communication, she stated to be chiefly responsible for the phenomenon known to the guides of the Adirondack region as the "flowering" or "blossoming" of the lakes. A portion of Mrs. Smith's letter runs as follows:

"I spent the summers of 1891, 1892, and 1893 at Honnedaga Lake, Herkimer County, N. Y., on the Adirondack League Club Tract. The altitude is about 2,200 feet, or possibly 2,400 feet. On the 14th of August of each year we noticed for the first time the water of the lake filled with golden globules so plenty that a glass slowly lowered and withdrawn was clouded. Microscopic examination at the time convinced me (though without books of reference) that it was an alga. It continued plenty as long as we were at Honnedaga, about September 1st each year, how much longer I could not say. At Little Moose Lake, at the northern end of the Club Tract, I made inquiry as to the appearance of the alga, which I may say the guides on all the Club Tract call 'the flowering or blossoming of the lake,' and they all assured me it was never to be seen in Little Moose Lake, though all knew it in Honnedaga and other of the lakes of the tract. While at Chilson Lake [Essex County] in 1901, I asked Mrs. Harris if she had ever noticed such a phenomenon and found that they had seen something of the kind but attributed it to the fall on the lake-surface of the pollen of trees or other plants. This is entirely different, as this last rises to the surface while the alga is more plenty below the surface and never rises



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