

Historical Contributions

First Fern Records from Virginia:
John Banister's Account of 1679-1692

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Editor's note: The following article is being reprinted, with permission of the American Fern Society, to celebrate the publication of this 50th issue of *Banisteria*. The reasons that I selected this article are:

1. It provides a brief synopsis of John Banister's life and career and informs readers that he did not live to publish his own discoveries. (Joseph and Nesta Ewan later published a full biography of Banister: Ewan, J., & N. Ewan. 1970. *John Banister and his Natural History of Virginia 1678-1692*. University of Illinois Press, Urbana, IL. 485 pp. They also prepared a short paper about Banister that appeared as the first article in the inaugural issue in *Banisteria*, published in 1992 to commemorate the 300th anniversary of his death.)
2. The paper reminds readers that Banister preceded Linnaeus and polynomials were used before the binomial system of nomenclature.
3. The article informs/reminds readers that Banister was both a collector and illustrator of plants.
4. Banister's written account of walking fern is included in the paper.

In an addendum to this reprint, Associate Editor Wieboldt discusses some issues associated with the list of fern species that appears on the last page of the Ewan paper, including numerous taxonomic changes and some possible misidentifications or specimens from a source beyond present day Virginia.

First Fern Records from Virginia: John Banister's Account of 1679-1692¹

JOSEPH EWAN

Seventy-four years *before* the *Species plantarum* of Linnaeus appeared, John Banister (1654-1692) listed seventeen ferns and lycosperms from Virginia. It is natural to think that our fern binomials originated with the Great Swede when, in fact, many of the common Atlantic Coast forms were known quite precisely under earlier polynomial names to naturalists, some of whom, like Banister, died before Linnaeus was born. Like Clayton's discoveries in Virginia in the next century, Banister's pioneer observations and descriptions of ferns and flowering plants would be quite unknown had not other botanists interested themselves in his work. Gronovius published Clayton's findings; John Ray (1686-1704) and Leonard Plukenet (1691-1705), Banister's.

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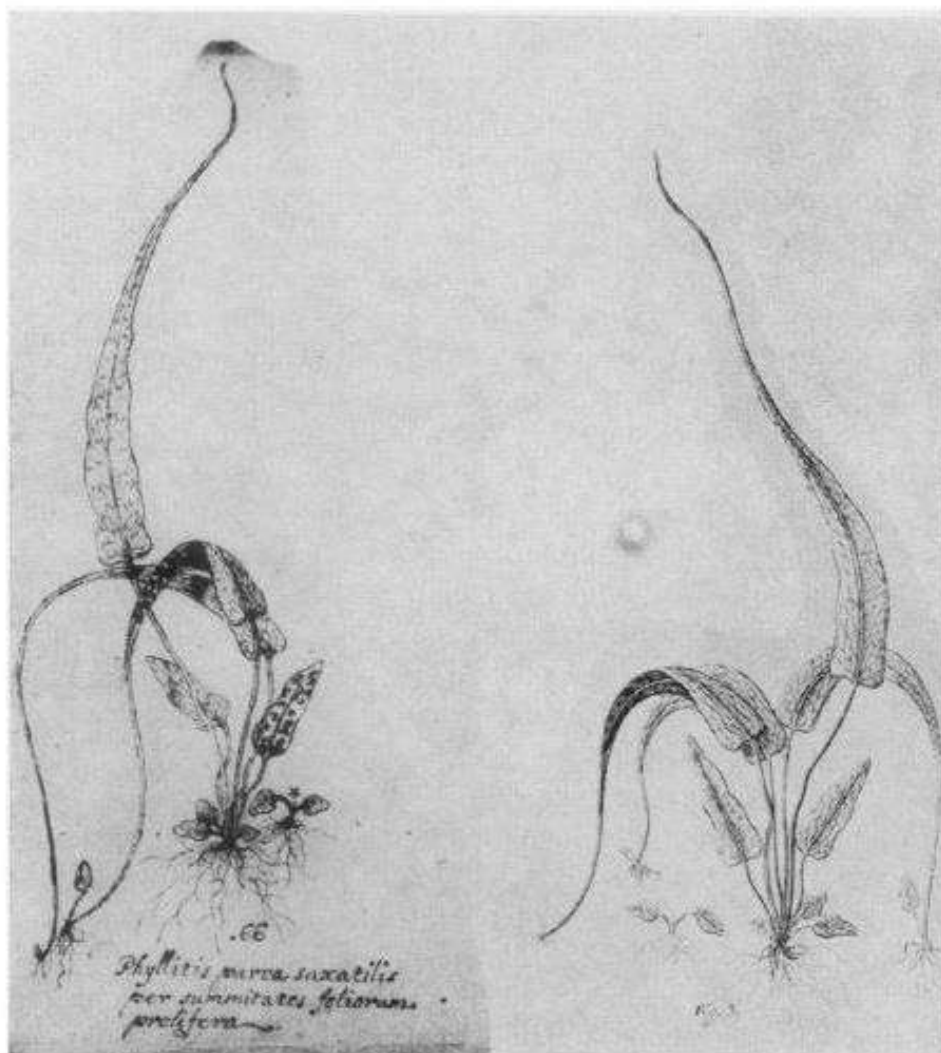
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Only Banister's early Catalogue was published, and his more complete account, edited by Sherard, rested in manuscript nearly three hundred years before its significance was understood.

This report describes only a small segment of a five-part manuscript recently brought to light at Oxford which is being edited for publication by Mrs. Ewan and me, including the identification of the approximately 375 plant species. In addition to the plant catalogue, the largest of five parts, the manuscript contains an account of insects, one of molluscs, another of general natural history, and an account of the Indians. In short, Banister's is the first *scientific* account for Virginia in the field of descriptive botany, entomology, and malacology. John Banister had keen powers of observation, a talent for drawing—he was self-taught—and familiarity with contemporary literature based upon an Oxford education in botany and natural philosophy. Had Banister lived beyond his thirty-eight years—he was accidentally shot by a companion while on a field trip—he would certainly have profoundly altered the course of science in colonial America.

Reverend Banister arrived in Virginia about the year 1676, and evidently began at once observing, collecting, and describing in Latin phrases the plants, including the ferns, he found there. His nominal task was as clergyman to the Church of England; his frontier work was among the colonists, and perhaps among the Indians, and in the world of nature that surrounded him. In the remarkably short span of about three years he assembled a catalogue of the plants he had found, noting their relationships with European species, or suggesting possible alliances if the plants were wholly new to him. Made acutely aware of the value of preparing a graphic record, he then taught himself to draw, and fifty-three of his sixty-five drawings survive in the British Museum, the majority published, sometimes modified, and with or without acknowledgment of their source, by Plukenet (1691-1705) whose *Phytographia* was extensively used by Linnaeus in his works on American botany.

Banister wrote detailed letters on Virginia natural history



RIGHT: PLUKENET'S FIGURE OF WALKING FERN BASED ON BANISTER'S DRAWING PUBLISHED IN HIS PHYTOGRAPHIA AND CAPTIONED "PHYLLITIS PARVA SAXATILIS PER SUMMITATES FOLIOBUM RADICOSA BANIST [ER] CAT [ALOGUS] STIRP [IUM] VIRG [ININSE] . . ."

LEFT: BANISTER'S ORIGINAL (UNPUBLISHED) DRAWING OF WALKING FERN MADE IN VIRGINIA PRESERVED IN THE BRITISH MUSEUM (PUBLISHED BY COURTESY OF THE TRUSTEES).

[The "*" just above the growing point of the plantlet relates to a matching "*" barely discernible at the tip of the upper frond. The handwriting is not Banister's, possibly Plukenet's, in spite of change of "prolifera" to "radicosa" in published version.]

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to his British colleagues, Dr. Robert Morison and Bishop Compton, to John Ray, Dr. Martin Lister, and perhaps to James Petiver. Four of Banister's letters, besides the excerpts which Lister published in *Philosophical Transactions* (1693), have been traced.

We know from William Aiton's printed record of the introduction dates of American plants into English horticulture that Banister certainly sent more novelties to his homeland than any other visitor to the New World before the year 1700. In Aiton's *Hortus Kewensis* many of Banister's introductions were listed with credit to him, although more usually they were credited to Bishop Compton and Jacob Bobart, both of whom enthusiastically grew his seeds and plants from Virginia.

It is of interest and is acknowledged that this study could have made little progress if it had been undertaken before the completion of the recent works of Raven (1942) on the life and times of John Ray, of Dandy (1958) on the content of the Sloane Herbarium, of Vines and Druce on the Morisonian Herbarium (1914), and of Raymond Phineas Stearns (1953) on the contribution of James Petiver. The several librarians who have enabled us to locate and identify three different manuscript versions of Banister's Virginia natural history, first at Oxford, then the British Museum, and recently at Colonial Williamsburg, have been most helpful.

We shall not repeat here Banister's Latin for the seventeen Pteridophyta he described from Virginia; it will be published with the detailed account, but what he found and recorded are summarized here. His description of what we today call *Botrychium virginianum* was the partial basis of Linnaeus's *Osmunda virginiana*, and Banister's description and drawing of the walking fern were mentioned by Morison, Plukenet, and Petiver, and all contributed to Linnaeus's establishing the species *Asplenium rhizophyllum*, later called *Camptosorus*. Linnaeus specifically cited Virginia as the source of seventeen Pteridophyta, and Banister knew thirteen of these. In short, Banister knew the majority

of the Virginia ferns and lycosperms described by Linnaeus seventy-four years later, a not inconsiderable and little appreciated fact. The four cited by Linnaeus, but not described by Banister, are *Osmunda claytoniana*, commemorating its discoverer, John Clayton, *Pellaea atropurpurea*, and *Woodwardia areolata*. *Polystichum lonchitis*, noticed for Virginia by Linnaeus, must have been mistakenly associated with that colony at the time *Species plantarum* was written. Some of Banister's one-line descriptions refer to classic works by Parkinson whose reference to *Adiantum pedatum*, for example, is the basis of Banister's admitting a Virginia fern to that species; or to Gerard whose good illustration of *Botrychium virginianum* contributed to Banister's recognition of the grape fern; or to Matthiolum, or Dodonaeus—each author in fact resting his work, then as now, on the labors of others.

Incidentally, the eighteenth century of Linnaeus muddled the knowledge of Virginia ferns, and the inimitable Professor Fernald (1935) detailed the story of *Asplenium platyneuron* in this connection. Three ferns were curiously mixed by Linnaeus, and only by adopting as a clear basis the collection made by Clayton and described by Gronovius are we able to salvage the name. Had Banister's original description and drawing been published during his lifetime subsequent confusion in this and other fern typifications would have been averted.

The Reverend botanist was so fascinated by the walking fern that he wrote one of his longest surviving accounts for any Virginia species, relating its growth and habitat. Fortunately William Sherard copied this from a letter into his draft of Banister's *Catalogus* at Oxford; this detailed account of the walking fern is lacking in the *Catalogus* in Banister's own hand preserved at the British Museum (cf. Ewan, in press).

"Phyllitis parva saxatilis per summitates foliorum prolifera. In Sept. last we occasionally took a journey towards, I might have said, to the mountains, had not the Indians w^{ch} were our guides, been afraid as they pretended, but I am apt to think it was policy not fear retarded them, and that they were unwilling

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to let us be acquainted with their recesses so far up in the country. In our march about 35 miles above the Falls of the James River on the southside our small path brought us to a vast rock, or rather the side of a hill, w^{ch} seem'd to be of entire stone part of w^{ch} was very thinly spread over with a swift fall of water, w^{ch} made a pleasant not loud noise, having no cragginess to interrupt its course. A little lower down this rivulet is received into a natural bason, & from thence conveighed into a small vault of craggy rocks, where with its fall it makes a Hollow sound, something like that of a kettle drum, but more like an Indian one, w^{ch} is a skin stretched over an earthen pot half full of water; it just shews its self & is again rec'd into an open Arch of rough stone, where among other Capillaries² grows this small but rare kind of Harts-tongue. This plant grows erect as others of the like kind, till it comes to the age of puberty and nature calls it down to propagate, & wⁿ its offsetts are strong enough to draw their own alimant it leaves them & grows up as before. This rock is crowned with not very large but well spreading trees of cypress-leav'd Savin under whose shade on beds of matted moss, we eat our dinner, & wis'd we might meet wth a place as pleasant & commodius four our repose at night. We went a day's journey & a half further & then cross'd the river w^{ch} we found prettie wide, but by reason of its declivity in many places fordable. In our way home the rich low grounds abounded with a kind of wild Baulm w^{ch} being trampled on by our horses as we rode thro it mightily refreshed us with its fragrant scent. Little else I think occur'd on this or the other side worth giving an acc(oun)tt of."

From this quotation you will see that Reverend John Banister had a genuine love of the Virginia woods and rivers, and wrote charmingly of her natural history.

²Banister alludes to Maidenhair which included species both of *Adiantum* and *Asplenium*, and from which the medicinal *Syrup of Capillary* was made. Cf. R. C. Benedict (1957).

Any botanist who has an interest in the history of his science can hardly avoid wondering about the possible existence of other manuscripts and notebooks that may be hidden in seldom-opened storage files. Some of them, if made available and studied carefully, almost surely would provide helpful information about early exploration routes, dates, and field observations. They might hold keys to some of the riddles surrounding the application of names given to plants by early writers, but not associated clearly, with any existing specimen.—Ed.

VIRGINIA FERNS AND FERN ALLIES KNOWN TO BANISTER
(1679-1692)

<i>Lycopodium alopecuroides</i> L.	<i>Polystichum acrostichoides</i> (Michx.) Schott
<i>Selaginella apoda</i> (L.) Spring	<i>Camptosorus rhizophyllus</i> (L.) Link
<i>Selaginella rupestris</i> (L.) Spring	<i>Asplenium platyneuron</i> (L.) Oakes
<i>Botrychium virginianum</i> (L.) Sw.	<i>Woodwardia virginica</i> (L.) Sm.
<i>Osmunda regalis</i> L.	<i>Adiantum pedatum</i> L.
<i>Woodsia ilvensis</i> (L.) R. Br.	<i>Adiantum capillus-veneris</i> L.
<i>Cystopteris fragilis</i> (L.) Bernh.	<i>Polypodium virginianum</i> L.
<i>Onoclea sensibilis</i> L.	<i>Polypodium polypodioides</i> (L.) Watt
<i>Thelypteris phegopteris</i> (L.) Slosson	

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Addendum to Ewan (1963) paper
Prepared by Associate Editor Thomas Wieboldt

Inspection of the list of ferns and lycophytes in Ewan (1963) reveals several that are phytogeographically improbable and, therefore, worthy of further discussion. Montane species would not be expected to occur at or near the Fall Line where Banister lived. Ewan & Ewan (1970) wrote, "By his own statement during his years in Virginia, Banister had reached at least 66 miles into the highlands above the falls of the James River," and "... so far as we know, his mountain plants were given to him." (p. 89). It is clear from writings in his mollusc catalogue that he had only heard of the western mountains but not seen them himself (Ewan & Ewan, 1970: 326-327). In addition to several ferns, a number of flowering plants also listed in his *Catalogus* must have come from farther afield. This assumption is based on present day distributions and what we know about ecological preferences of the species, but Banister's writings mention features of the landscape in other parts of the country far beyond his own travels. It seems likely that objects of natural history made their way to him as a learned man of science.

John Banister sent several copies or parts of his *Catalogus Plantarum in Virginia observatorum* to European men of science. The now-familiar Linnaean system of classification was not yet born, and plants were described by Latin phrases rather than having names in the sense we think of them today. The entries in the *Catalogus* would originally have corresponded to specimens or drawings, or both. The job which Joseph and Nesta Ewan undertook was to try to find as many specimens as possible and to assign genus and species names to each.

The authors mentioned on page 141, their intention to publish a more detailed account which would include Banister's Latin polynomials. Indeed, in 1970, they included an extensively annotated version of Banister's entire Plant Catalogue (about 340 descriptive phrases) in their book, "John Banister and His Natural History of Virginia 1678-1692" (Ewan & Ewan, 1970). Comparison of the fern taxa contained therein reveals additional details about several species as well as additions to and omissions from the list published in *American Fern Journal* (Ewan, 1963). Since most of the names have changed since 1963, all 17 species are listed below with current names following in square brackets where different, along with common names (nomenclature follows the Digital Atlas of the Virginia Flora [2018]). The Plant Catalogue published by Ewan & Ewan (1970) contains two additional lycopods not included in the *American Fern Journal* article. These are appended to the end of the list.

Notes inform the reader as to changes and differences between the two accounts. The discrepancies noted help one to appreciate the enormous job it was to undertake such an endeavor. In speaking about their work, the Ewans stated, "We were also able at this time to search more systematically for unrecognized specimens that might be attributed to Banister in the Sloane Herbarium at the British Museum (Natural History). This task, although aided by Dandy's guide [reference to Sloane Herbarium, facsimile no. 91 (1958)], is unrewarding and exasperating because of the loss or unreliability of the surviving labels attached to the sheets." (Ewan & Ewan, 1970: 147). A few pages later they also mention "Virginia specimens ... which had been moved to Petivar's Herbarium ..." (Ibid, p. 150). No doubt, the archives of older European herbaria, and pre-Linnaean herbaria, in particular, are a challenge even for the most informed student of historical botany!

LIST OF FERNS AND LYCOPHYTES

Lycopodium alopecuroides L. [*Lycopodiella alopecuroides* (L.) Cranfill; Foxtail Clubmoss]

Selaginella apoda (L.) Spring. [*Lycopodioides apodum* (L.) Kuntze; Meadow Spikemoss] – This species is not found in the Plant Catalogue. The absence of a Latin polynomial or other information does not allow one to explain the earlier attribution.

Selaginella rupestris (L.) Spring. [*Bryodesma rupestris* (L.) J. Sojak; Rock Spikemoss]

Botrychium virginianum (L.) Sw. [*Botrypus virginianus* (L.) Michx.; Rattlesnake Fern]

Osmunda regalis L. [*Osmunda spectabilis* Willd.; Royal Fern]

Woodsia ilvensis (L.) R. Br. - Presumably, redetermined as *Woodsia obtusa* (Spreng.) Torr. [Blunt-lobed Woodsia]. *Woodsia obtusa* is the only *Woodsia* included in Ewan & Ewan's (1970) version of the Plant Catalogue. Furthermore, *W. ilvensis*, being a montane species, would be phytogeographically improbable. The nearest population and only Piedmont occurrence is at Sugarloaf Mountain, Nelson County, considerably northwest of the area Banister is believed to have traveled.

Cystopteris fragilis (L.) Bernh. [*Cystopteris protrusa* (Weath.) Blasdel; Lowland Bladder Fern] - The Plant Catalogue further specifies var. *protrusa*, now given species status. *Cystopteris fragilis* (= var. *fragilis*) is a

northern, circumpolar species not known to occur in Virginia.

Onoclea sensibilis L. [Sensitive Fern or Bead Fern]

Thelypteris phegopteris (L.) Slosson – This species is not known to occur in Virginia and is a rare, strictly montane species in the region. The common and widespread species of eastern Virginia in this genus is now known as *Phegopteris hexagonoptera* (Michx.) Fee (formerly *Thelypteris hexagonoptera* (Michx.) Weath.) [Broad Beech Fern]. The two species are easily confused due to a striking similarity in overall form.

Polystichum acrostichoides (Michx.) Schott [Christmas Fern]

Camptosaurus rhizophyllum (L.) Link [*Asplenium rhizophyllum* L.; Walking Fern]

Asplenium platyneuron (L.) Oakes [*Asplenium platyneuron* (L.) BSP; Ebony Spleenwort] – The Plant Catalogue contains two different entries (polynomials) determined as this species, the first preceded by a question mark. Its leading term, *Lonchitis*, is shared by the two previous entries which are referable to the Christmas fern, *Polystichum acrostichoides*. The second polynomial (*Trichomanes major foliis longis auriculatis*) is more descriptive of this fern and can confidently be assigned to it.

Woodwardia virginica (L.) Sm. [Virginia Chain Fern]

Adiantum pedatum L. [Maidenhair Fern]

Adiantum capillus-veneris L. [Venus'-hair Fern or Southern Maidenhair Fern] – The only positively known occurrence of this fern in Virginia is an 1879 record from the New River in Wythe County which has never been rediscovered. There are a few Coastal Plain records from calcareous sediments in the Carolinas (Weakley, 2015), thus holding out the possibility that it once occurred in the Virginia Coastal Plain as well, most likely on Miocene shell deposits which are strongly calcareous. This intriguing possibility is given more credence by the fact that Banister was also a malacologist and is known to have collected from and discussed fossil shell deposits with Martin Lister of Yorkshire and Oxford who may have inspired his interest in collecting molluscs in

Virginia (Ewan & Ewan, 1970: 309). An entry in the mollusc catalogue states, “And I myself so or thirty miles up in ye freshes have seen on ye land between high and low-water mark a bed of scallop shells grown into a rock” (Ibid, p. 323). Such habitat may well have supported Venus'-hair fern.

Polypodium virginianum L. [Common Polypody Fern]

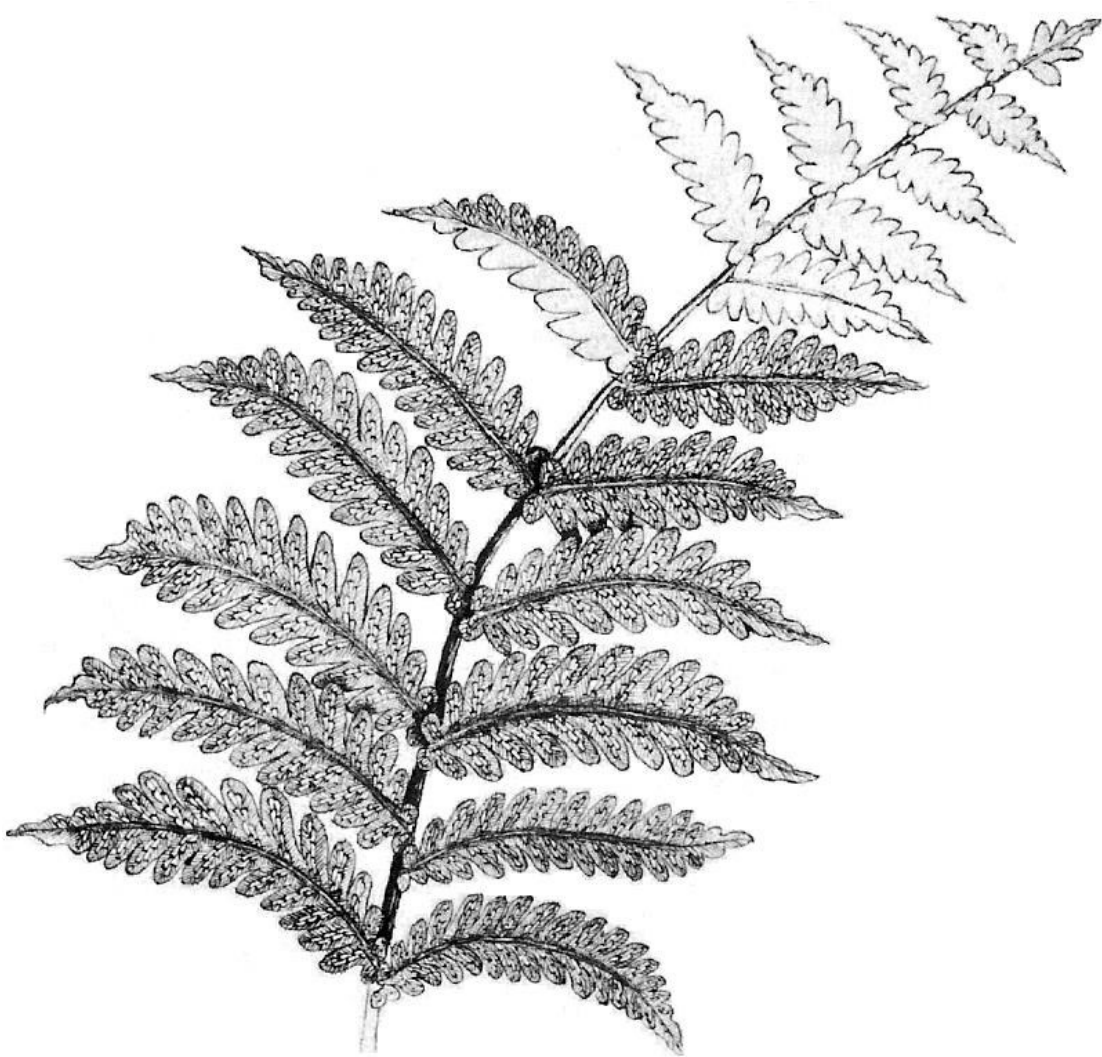
Polypodium polypodioides (L.) Watt [*Pleopeltis polypodioides* (L.) Andr. & Windham ssp. *michauxiana* (Weath.) Andr.; Resurrection Fern] – The entry in the Plant Catalogue adds var. *michauxianum* Weath. which distinguishes the subspecies known from temperate North America.

Lycopodium complanatum L. [*Diphasiastrum digitatum* (Dill. ex A. Braun) Holub; Common Running-cedar]

Lycopodium obscurum L. [*Dendrolycopodium obscurum* (L.) A. Haines; Common Ground-pine]

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Virginia Chain Fern
Woodwardia virginica (L.) Sm.

Original drawing by John Banister, sent to Bishop D. H. Compton in 1689.
Figure 35 in folio in Sir Hans Sloane's MS 4002 in the British Museum.
Photocopy courtesy of Joseph and Nesta Ewan.