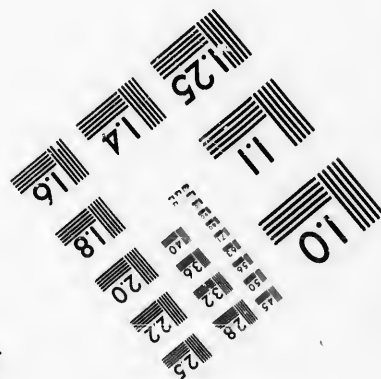
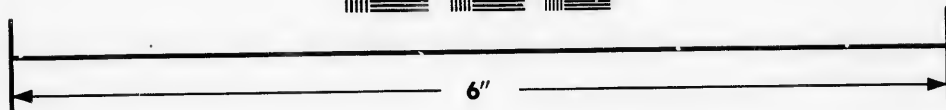
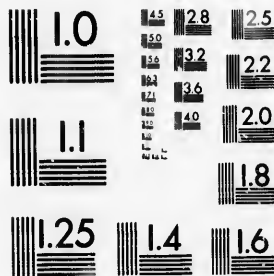


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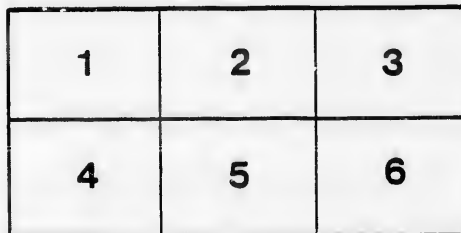
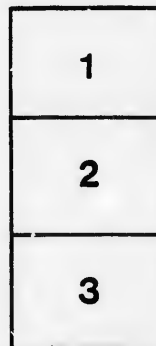
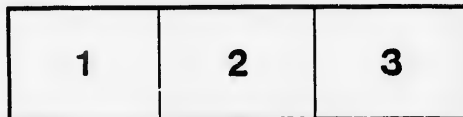
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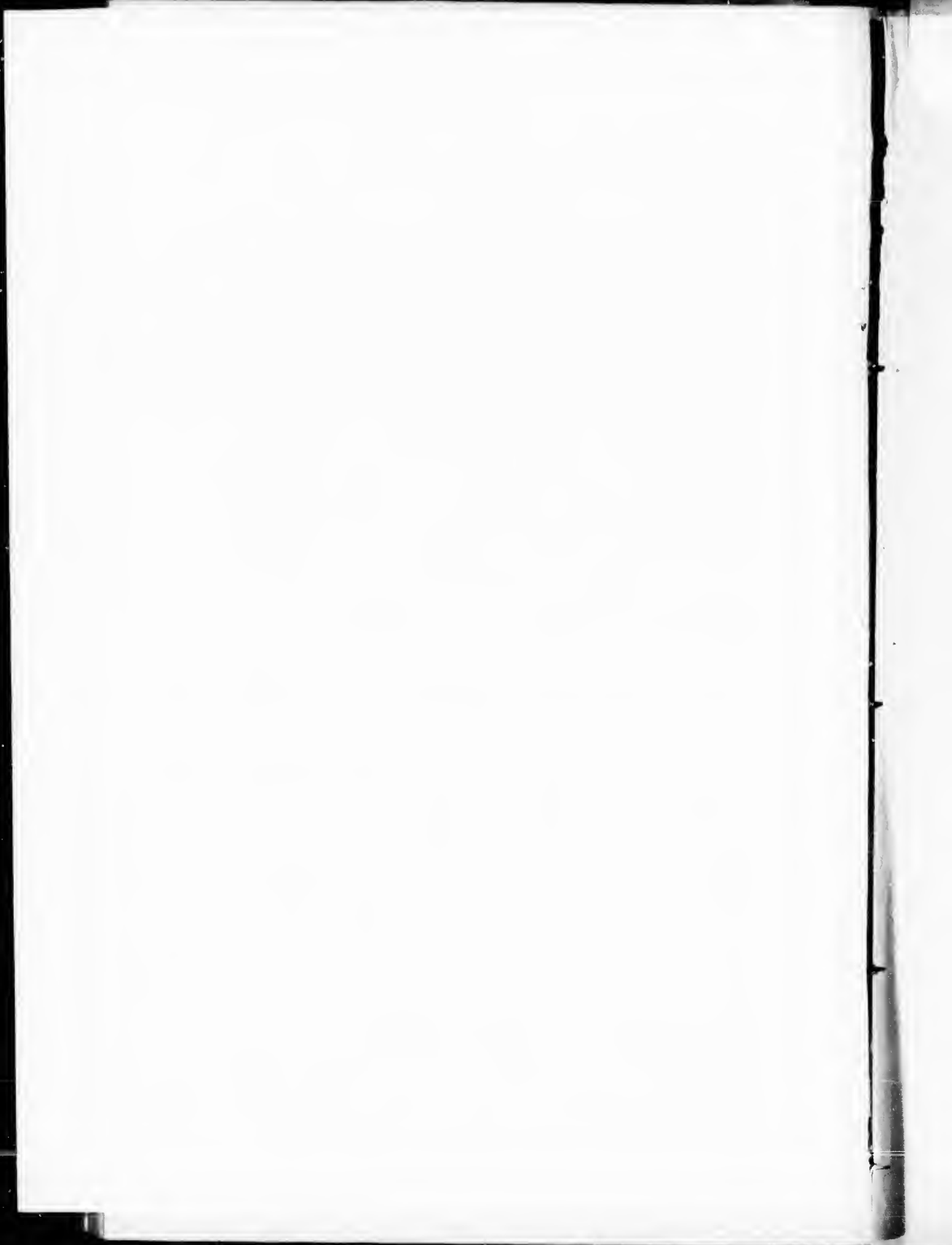
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CATALOGUE  
OF THE  
"DAVENPORT HERBARIUM"  
OF  
NORTH AMERICAN  
FERNS

NORTH OF MEXICO

MASSACHUSETTS HORTICULTURAL SOCIETY,  
BOSTON, MASSACHUSETTS, U. S.

WITH NAMES OF DONORS AND COLLECTORS, LOCALITIES, GEO-  
GRAPHICAL RANGE, CRITICAL NOTES, AND AN APPENDIX  
CONTAINING A LIST OF ALL DOUBTFUL SPECIES,  
AND THOSE HERETOFORE ERRONEOUSLY  
CREDITED TO THIS REGION.

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PUBLISHED BY THE AUTHOR.  
1879.



## PREFATORY NOTE.

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The special object in publishing a catalogue of the "Davenport Herbarium"\* is to make its claims upon the consideration of collectors more widely known.

The herbarium now contains specimens of every authentic species of the ferns at present known to inhabit North America, north of Mexico, yet some of the rarer species are imperfectly represented, and lack those essentials of good herbarium specimens, caudex and roots. These I am anxious to improve, and also to complete the collection, as originally planned, by the addition of copious suites of specimens with caudex and roots, from widely different localities so as to exhibit the plants in all stages of their development, as it is only by a careful study and comparison of the specimens in such a collection that a correct knowledge of the different species can be obtained.

Fuller suites of the ferns of Texas, Arizona and New Mexico, and also of the rarer species from California and Florida, are particularly desired, and such specimens are earnestly solicited.

I have endeavored as far as possible to bring this Catalogue into conformity with Prof. Eaton's work on the "Ferns of North America" and have only ventured to differ from that distinguished authority when special investigations have led me to adopt opinions which, in justice to myself, I feel obliged to retain.

I fully appreciate Prof. Eaton's great knowledge of ferns and his superior facilities for the determination of specimens, which make it pleasanter always to coincide with his views, and I desire to record here my high regard for his judgment.

I am greatly indebted to him, and to my friend Mr. Robinson for uniformly kind encouragement, without which it is doubtful if I should have ventured so far in the direction in which I have been working, and for which this acknowledgement seems to me a very poor return.

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\*Torrey Club Bulletin, VI, 51.



From Mr. Robinson's herbarium came the original specimens about which I have gathered the present collection, and he has watched its growth with no less interest than myself, and with as much pleasure as he could have done had it been his own. The herbarium now contains 32 genera, 146 species (~~two~~ species, *Woodwardia radicans* and *Aspidium unitum*, being only represented within our limits by their varieties), and, as herein recognized, 16 varieties. One of the latter, *var. Floridanum*, of *Aspidium cristatum*, may probably be eventually transferred permanently to the list of species, and we may confidently expect, from the frequency of late discoveries, still further additions to our North American ferns.

In the recognition of varieties I have, perhaps, drawn the lines closer than some will be willing to approve, but I could not consistently with my own views do otherwise. For example: in the case of ferns having the margins of their fronds or pinnae normally serrate it does not seem well to make varieties out of specimens that merely have their serratures or incisions a little deeper than usual—unless there are other well marked differences of character, as in the variety *incisum* of *Asplenium Trichomanes*, where the pinnae are not only deeply incised, but elongated to such a degree as to change the whole appearance of the plant and, in some specimens at least, confuse it with small specimens of another species (*A. ebenum*)—as it is only natural for such serratures and incisions to vary in a greater or less degree. But in the case of ferns with their margins normally entire such serratures or incisions, if constant, may be considered as deviations from normal characters sufficiently distinct to justify our regarding them as good varieties: or where individual plants exhibit well marked and permanent differences of habit or structure, such differences are entitled to recognition. In accordance with these views I have thrown all questionable varieties into brackets in the notes under the specific headings—retaining them in that form simply as a matter of record—and given separately all forms that I am disposed to recognize as good varieties, or whose claims to that consideration I am not prepared at present to question.

The geographical notes to the genera are based on Mr. John H. Redfield's admirable paper on the "Geographical Distribution of the Ferns of North America," published in *Torrey Club Bulletin*, Vol. VI, No. 1, (Jan. 1875). In this paper Mr. Redfield has distributed our species into six geographical divisions, as follows:

- I. "COSMOPOLITAN: widely distributed over the globe, in both temperate and tropical regions.

- II. 'BOREAL': inhabiting (with a few exceptions) the northern portion of the United States, extending through Canada and British America, some species even reaching Labrador, Greenland and Alaska, and nearly all represented also in the northern portions of the old world.
- III. 'APPALACHIAN': extending throughout the mountain and hilly regions of the states east of the Mississippi, often to the coast, and northward into Canada, and in a few instances also inhabiting the old world.
- IV. 'PACIFIC': extending along the western border of the continent at points from Alaska to California, and in a few cases appearing also in the Rocky mountain region.
- V. 'NEW MEXICAN': inhabiting the central mountain regions of New Mexico and Colorado, many of the species extending thence into Mexico, and some even to South America, and a few of them also occurring in California.
- VI. 'TROPICAL': inhabiting the border of the Gulf of Mexico, most of the species extending into the West Indies and Tropical America."

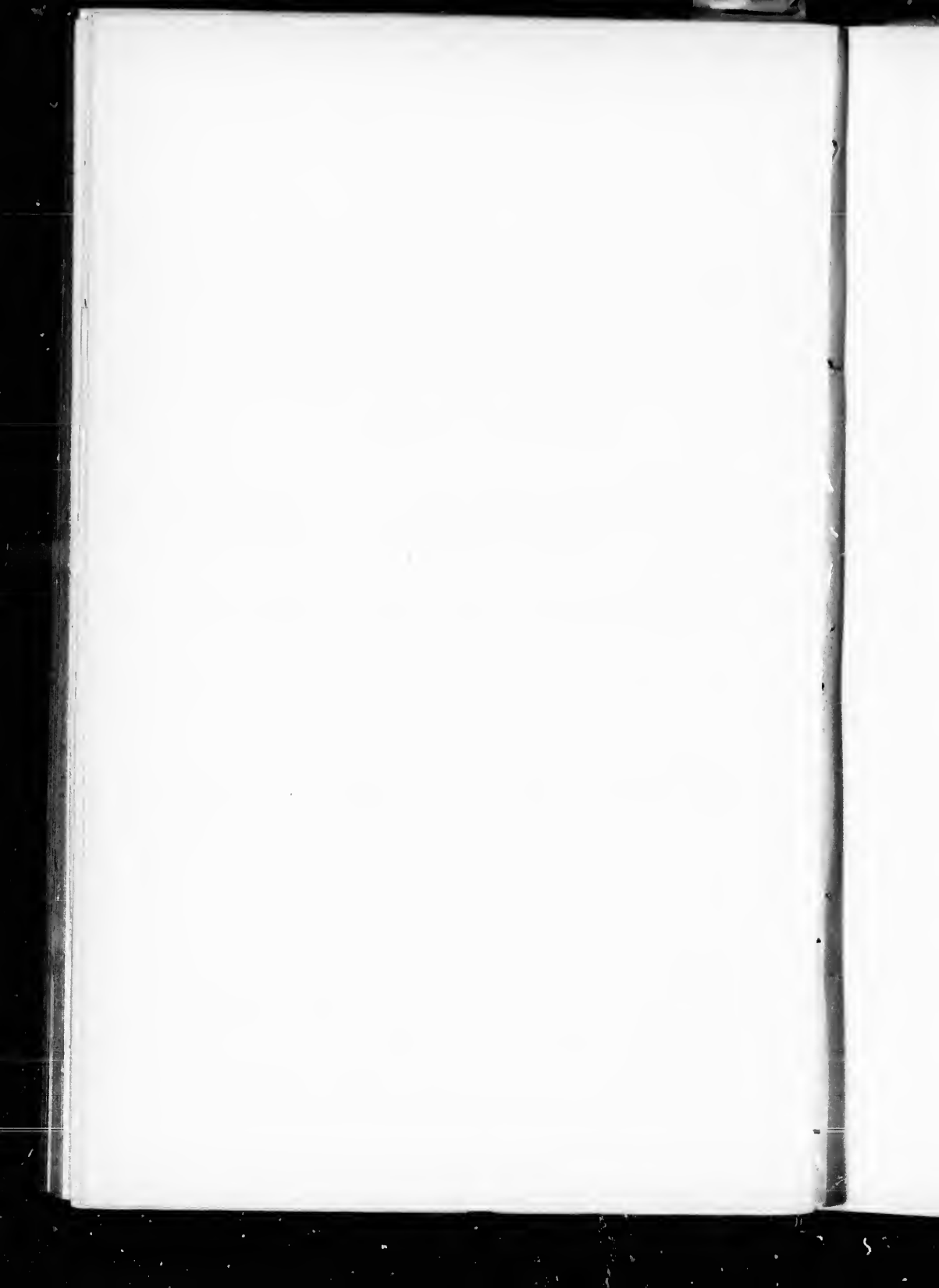
The changes in nomenclature have been made in accordance with the authority of Prof. Eaton, whose explanations in the forthcoming numbers of the "Ferns of North America" will be looked for with much interest.

I propose now to add to the herbarium the remaining vascular Cryptogams of the United States, and solicit specimens for that purpose.

All contributions, either of such plants or of new or rare ferns will be thankfully acknowledged, and duplicate specimens of other species sent in exchange, if desired, whenever possible.

*December, 1878.*

GEO. E. DAVENPORT.



AUTHENTIC  
NORTH AMERICAN SPECIES  
IN THE HERBARIUM.

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Since the first pages of my Catalogue were printed, some specimens, brought forward by Mr. Faxon, have led to an investigation which shows that the *Polypodium pectinatum* of Linnæus has been collected and distributed under the name of *Polypodium Plumula*, H. B. K. and that we have two species where heretofore only one has been recognized.

The following arrangement therefore, is to be substituted for that given on the first page.

**Polypodium pectinatum, L.**

Florida: Enterprise, C. E. Faxon, April, 1873; Halifax River, Miss Reynolds, 1877; Manatee, Dr. Garber, Mch., 1878.

"Banks of streams in hummocks," Dr. Garber, l. c. "On the ground, rarely on trees," Miss Reynolds, in litt.

**Polypodium Plumula, H. B. K.**

Florida: Enterprise, on trunks of trees with *P. pectinatum*, C. E. Faxon, April, 1873; Indian River, Mr. Whitney (ex. herb. C. E. Faxon), 1875; 14 miles west of St. Augustine, "in deep woods on live oak trees," Miss Reynolds, 1877; Ocala, Marion Co., W. H. Shockley, Mch., 1878.

For a fuller explanation see "Ferns of North America"—parts ined.

Howell, Nov., 1874-75. Canada (Owen Sound), Mrs. Jesse D. Roy. Middlesex Co., Mass., G. E. D., 1874. Essex Co., Mass., including some curious abnormal forms, John Robinson, 1874. Bethany, W. Va., E. Richardson, Oct., 1878. Victoria, Vancouver's Island (*var. occidentale*, H.), Prof. John



AUTHENTIC  
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**ACROSTICHUM. L.**

AN extensive genus of tropical ferns including several groups or sub-sections, the single species within our limits belonging to the sub-section *Chrysodium*, Fee.

**Acrostichum (§Chrysodium) aureum, L.**

Florida: Indian River, Dr. Edward Palmer, 1874; Mr. Whitney (ex. herb. C. E. Faxon), 1875; J. Donnell Smith, Mch., 1877. East Florida, Miss Mary C. Reynolds (ex. herb. C. E. Faxon), 1876. Manatee, Fla., Dr. A. P. Garber, Mch., 1878.

HAB.—"Borders of brackish marshes, bayons, creeks and rivers." Dr. Garber in Bot. Gazette, Oct. 1878.

**POLYPODIUM. L.**

THE largest genus of ferns, widely distributed, our North American species few in number, and, with two exceptions, as noted below, found growing on rocks or trees. In their geographical range, with the exception of *P. vulgare*, which extends eastward throughout the hilly region to the coast, and northward into Canada, they belong to the Pacific and Tropical divisions. Redfield, l. c.

**Polypodium Plumula, H. B. K.**

Enterprise, Fla., C. E. Faxon, April, 1873. Manatee, Dr. Garber, Mch., 1878.

HAB.—Banks of streams in hummocks. Dr. Garber, l. c.

**Polypodium vulgare, L.**

California (Sierras?). F. A. Miller, 1873. Oregon (including Hooker's *var. occidentale*), "on trunks of trees," Joseph Howell, Nov., 1874-75. Canada (Owen Sound), Mrs. Jesse D. Roy. Middlesex Co., Mass., G. E. D., 1874. Essex Co., Mass., including some curious abnormal forms, John Robinson, 1874. Bethany, W. Va., E. Richardson, Oct., 1878. Victoria, Vancouver's Island (*var. occidentale*, H.), Prof. John

Macoun, Dec. 12, 1872. The *var. Cambricum* has been received by Prof. Eaton from Conn. and New York State. (Ferns of N. A., p. 241.)

NOTE.—I wish to call the attention of botanists to the venation in this species. It is supposed always to have free veins, but I have in two instances—once in a specimen from Mass., and once in a specimen from Oregon—detected a union of the lower series of veins in the base of a single pinna. Such isolated instances, that may have been wholly accidental, have no special value, except as they indicate the possibility of their occurring again, and in a greater degree, but it will be well to make a note of all such occurrences that come under our observation. I have a strong suspicion that all of our Pacific Polypodiums, with the exception of *P. Scouleri*, are mere forms of one species of which *P. Vulgare* is the type. This will appear in no way improbable if we take into consideration the remarkable forms described and figured by the English authors, and such investigations as are here recommended may help to determine this question. I shall be greatly obliged to any one who will communicate to me specimens of *P. Vulgare* with the slightest tendency on the part of the veins to unite.

#### **Polypodium falcatum, KELLOGG.**

Oregon 1875; Washington Territory, on basalt rocks, Dec. 1876. Joseph Howell; including some fine specimens with fronds having pinnae with entire margins, and others with deeply, almost incisely serrated margins on the same rootstalk.

NOTE.—Mr. Baker (Syn. Fil. Hooker and Baker) regards this fern as a form of *P. Vulgare*, and it certainly appears to run directly into that species, as a fine series of specimens kindly furnished to me by Mr. Howell shows; but as I have had no opportunity to examine them as carefully as I would like to, I retain the specific name here in accordance with the views of Prof. Eaton.

#### **Polypodium Californicum, KAELE.**

(*P. intermedium*, H. & A.)

California (Sierras?). Miller, 1873; Mt. Diablo, Alameda, Cal., Dr. Wm. P. Gibbons, 1874; Santa Cruz, Dr. C. L. Anderson, 1874-6; San Diego, D. Cleveland, 1875-8; Santa Barbara, Mrs. Sarah P. (Ellwood) Cooper, 1876-8; Plumas Co., 1876. San Jose, 1877, Mrs. Mary E. Pulsifer Ames; Yuba Co., Miss Emily O. Pelton, 1877-8; Napa Valley, Rev. E. L. Greene, 1875.

NOTE.—I have long been inclined to regard *P. Californicum*, KAELE, and *P. intermedium*, H. & A., as identical. The supposed difference in the venation does not hold good, as it is not uncommon to find specimens with the veins partly anastomose and partly free in the same frond. It is to be remarked, however, that in specimens from northern California and the interior mountain ranges, the veins are nearly always

free, while in those from the coast range they are oftener anastomose, or partly so. The other differences are only such as we may expect to find in a large series of specimens of any species from different localities, or sometimes even from the same locality. The difference in the texture of different specimens is very great. Some of Dr. Anderson's Santa Cruz specimens are so thin and membranaceous as to be almost transparent and show the venation beautifully. I have similar fronds from Santa Barbara (Mrs. Cooper), and suppose this to be owing, partly at least, to the plants growing in the shade of trees, or other vegetation, as other specimens from the same localities gathered in more exposed places are thicker in texture, and have the veins more concealed. Mr. Cleveland's specimens, from San Diego, are of the latter class, but in most of my specimens from the coast region the venation is easily seen with a pocket lens by holding the specimens up to the light. In receding from the coast inland through the mountainous regions the species acquires a still firmer texture and approaches sometimes inconveniently near to *P. Vulgare*. Some of Miss Pelton's Yuba Co. specimens, and Mr. Miller's specimens from the Sierras are in no way different from *P. Vulgare* in texture, but are distinguishable from that species by the oblong sori, and the broader, ovate fronds. An examination of a series of specimens of the two forms heretofore given on our Check-lists as distinct species from their entire range in California will not reveal difference enough between the different specimens from the coast region, or between those of the coast region and the inland, or northern region, extending to the Sierras, to make it possible to draw any intelligible line of separation, and I am of the opinion that Dr. Hooker was right in uniting the two forms under the one specific name of *P. Californicum*, (Syn. Fil. H. & B.). Prof. Eaton appears latterly to have adopted the same view in Ferns of North America. p. 120. as he omits *P. intermedium* from our list of Polypodiums.

Sub. Note.—Since writing the above note, Parts X and XI of the "Ferns of North America," have appeared, in which Prof. Eaton has finally united the two forms under the present specific name, but separated them into two varieties as follows: *a. var. Kaulfussii*; *b. var. intermedium*. A comparison of his remarks with my own will show an apparent difference of opinion, which, I suspect, is more apparent than real. I can only say that my own specimens fully justify the remarks which I have made upon them, and such I suppose to be the case also with his specimens. But this fact seems to me to show that it would be better to call them all by the specific name than to separate them into varieties based upon characters so unreliable as is the texture and venation in this species; and I cannot forbear expressing the conviction that there is need of a more thorough elucidation of our Pacific Polypodiums.



**Polypodium incanum**, SWARTZ.

Florida, ex. herbs, John Robinson and Wm. Edwards. Bedford Co., Va., A. H. Curtiss, Sept., 1874. Kentucky, Rev. John Hussey (ex. herb. C. E. Faxon), 1875; Sycamore trees, Oldham Co., John Williamson, Aug., 1878. Jacksonville, Fla., J. Donnell Smith, Feb., 1876.

**Polypodium Scouleri**, H. & G.

California (Saucelito), J. H. Redfield, 1872; Miller, 1873; Oct., 1878, from an unknown source.

**Polypodium Phyllitidis**, L.

Florida: Indian River, Dr. Palmer, 1874; J. D. Smith, Mch., 1877; Miami, July, 1877, Manatee, April, 1878, Dr. Garber.

HAB.—“Confined to low, humid and densely shaded hummocks.” Dr. Garber, l. c.

**Polypodium aureum**, L.

Florida: (Enterprise) C. E. Faxon, 1873; Miami, Dr. Garber, May, 1877; Indian River, J. D. Smith, Mch., 1877; New Smyrna (ex. herb. F. S. Plympton), 1878.

HAB.—“Associated always with the Cabbage Pal netto, and growing on its stem.” Dr. Garber, l. c.

**GYMNOGRAMME**, DESV.

In this genus, and the next four genera, the drought-resisting species largely predominate, and, with the exception of *Cryptogramme* (see note to that genus), are most abundant in the Pacific and New Mexican range. A few species of *Cheilanthes* penetrate the Tropical division in the south, as far as Florida (see Curtiss' list of southern plants, fascicle 11, 1878), and one, *C. vestita*, extends northward into New York state, but no *Notholaena* have as yet been recorded out of this range. The *Pellaeas* have a more extended range, penetrating the Tropical region southward, and the Appalachian division as far north as Vermont and Canada. One species, *P. gracilis*, is strictly Boreal, and confined to the northern portion of the United States. These genera comprise our most beautiful ferns, some species of *Notholaena* and *Cheilanthes* being especially remarkable for their exquisite grace and beauty. The different species are to be sought for in mountainous regions, along high cliffs, in clefts of rock, ravines, and on rocky hillsides.

**Gymnogramme triangularis**, KAULF.

California: Miller, 1873; Dr. Gibbon (Mt. Diablo), 1874; Dr. Anderson (Santa Cruz), 1874; Miss Pelton (Yuba Co., west of Dutch Gap, May, 1876), 1875-8; Mrs. Cooper (Santa Barbara) 1876-8; Dr. C. C. Parry (Southern California), 1876.

NOTE.—My specimens of this fern include both the yellow and white-powdered forms. The latter is sometimes regarded as a variety, but it is questionable if it is entitled to be so considered. It appears most frequently among my specimens from the Sierras (Mrs. Ames), and interior mountain ranges of northern California (Miss Pelton), but occurs also among my specimens from southern California (Dr. Parry, Mrs. Cooper and Mrs. Woodward), and is probably distributed throughout the state with the regular form. The deep golden colored form appears most abundant near the coast region, my finest specimens coming from Santa Cruz (Dr. Anderson), and Santa Barbara (Mrs. Cooper). I find a regular gradation of color from pure white to golden yellow in the pulverulent powder of the present species, and this is not uncommon in other farinaceous ferns. It is especially noticeable in *Notholæna candida*, HOOKER, where the different colored powder appears to have given rise to no little confusion, some forms having been described even as distinct species. (See Hooker's "Species," and "Synopsis Filicum," for the different synonymy referred in the latter work to *Notholæna sulphurea*, J. Sm.)

**Gymnogramme hispida**, METT. (The *G. pedata* of our Check Lists.)  
Texas, Dr. Parry, 1851. Arizona (ex herb. Mrs. Rüst), near Fort Grant. ? 1877.

#### NOTHOLÆNA. R. Br.

**Notholæna sinuata**, KAULF.  
Texas, Dr. Parry, 1851.

**Notholæna ferruginea**, HOOKER.  
Texas, Dr. Parry, 1851.

**Notholæna candida**, HOOKER.  
Texas, 1851; Southern California (San Diego Co.?), 1876. Dr. Parry. San Diego Co., Cal.: (including *var. lutea*, Hooker, Sp. Fil. V, p. iii.) D. Cleveland, 1878; Miss Annie E. Burbeck (Prof D. C. Eaton, Donor), 1878. Near San Bernardino, Cal., Wm. Stout, April and May, 1878.

**Notholæna Hookeri**, D. C. EATON. Ferns of the South West ined.  
Texas, Dr. Parry, 1851.  
This is the *N. cretacea* of our Check-lists and Torrey Bulletin IV, p. 18.

**Notholæna dealbata**, KUNZE.  
Kansas: Dr. Parry, 1873; James Wilson (Cowley Co.), 1877.

**Notholæna Fendleri**, KUNZE.  
Colorado: Dr. Parry, 1874; T. S. Brandegee (Cañon of the Arkansas), 1874; W. M. Wilson, 1875; Miss Pelton, 1877;

(Clear Creek Cañon), Georgetown. Addison Brown. Aug. 5, 1878.

**Notholæna Newberryi**, D. C. EATON.  
San Diego, Co., Cal., Cleveland. 1875-8; Dr. Parry. 1876.

**Notholæna Parryi**, D. C. EATON.  
Utah, near St. George, 1874; San Diego Co., Cal., 1876. Dr. Parry. San Jacinto Mt., near Aqua Caliente, San Diego Co., Cal. Wm. Stout, April and May, 1878.

**Notholæna tenera**, GILLIES.  
Utah, 12 miles southwest from St. George: Dr. Parry, 1874; Dr. Palmer. 1876.

### CHEILANTHES. SWARTZ.

**Cheilanthes Californica**, METT.  
California: Mr. Foster (Santa Barbara, ex. herb. John Robinson), 1873; Mrs. Cooper (Santa Barbara), 1876-8; Cleveland (San Diego), 1874-8; J. Muir (Yosemite, ex. herb. Miss Pelton), 1875; Miss Pelton (Butte Co.), 1878.

**Cheilanthes Wrightii**, HOOKER.  
Southern Arizona. Dr. Rothrock (ex. herb. D. C. Eaton), 1874. Arizona, near Fort Grant? (ex. herb. Mrs. Rust), 1877.

**Cheilanthes microphylla**, SWARTZ.  
Mexico, ex. herb. John Robinson. Islands near mouth of St. John's river, Florida. A. H. Curtiss, August, 1878.

**Cheilanthes Alabamensis**, KUNZE.  
Chillicothe, Tenn., ex. herb. State Univ. Mich., Prof. M. W. Harrington, Donor. East Tennessee, 1872; Lee Co. (on the boundary line of Tenn.) Va., 1875. Walter Faxon, ex. herb. C. E. Faxon. San Antonio, Texas, Mrs. M. J. Young, 1875.

NOTE.—This fern looks so much like a *Pellaea*, especially in those specimens with continuous involucres, that I am not sure but that Mr. Baker is right in placing it in that genus (*Pellaea Alabamensis*, BAKER, SYN. Fil. II. & B.). But as some specimens of it are hardly to be distinguished from specimens of *C. microphylla*, Swz., a species which the same author retains in *Cheilanthes*, and my own specimens are altogether too meagre to permit my forming any decided opinion either way, I have retained this species in its present position in deference to the authority of Prof. Eaton. Its claims to this position seem equally as strong as those of *C. microphylla*, and in *Species Filicum*, Vol. III, Dr. Hooker expressed the opinion that it might be the extreme northern form of that species.

**Cheilanthes Viscida**, DAVENPORT.

Downieville Buttes, Cal., J. G. Lemmon, Sept., 1872. ? Near San Gorgorio Pass, eastern slope of Sierra Nevada, Parry and Lemmon, April, 1876.

**Cheilanthes leucopoda**, LINK.

Uvalde cañon, Rio Nueces, Texas, Mrs. Young, 1875.

**Cheilanthes vestita**, SWARTZ.

Washington Heights, New York City (ex. herb. John Robinson), W. W. Denslow. Snake Hill, near New Jersey, W. H. Leggett, 1865. Bedford Co., Va., A. H. Curtiss, 1873-4. Barren Co., Kentucky, Rev. John Hussey (ex. herb. A. H. Curtiss), 1874. Poughkeepsie, N. Y., Clarence Lown, Sept., 1878. Estill Co., Kentucky, John Williamson, Aug., 1878.

**Cheilanthes Cooperæ**, D. C. EATON.

Santa Barbara, Cal., Miss Winchester, ? Mrs. Geo. M. Woodward, Donor. Slover Mt., near Colton, San Bernardino Co., Cal., Dr. Parry, 1876; Santa Barbara Co. (Cañon of the Cathedral Oaks), Mrs. Cooper, 1877-8; near San Bernardino, Wm. Stout, April, 1878.

**Cheilanthes gracillima**, D. C. EATON.

California, Miller. (Sierras?) 1873; Mrs. R. M. Austin (Plumas Co.), 1875; Miss Pelton, Yuba Co., 1875. Sierras, Aug., 1878.

**Cheilanthes lanuginosa**, Nutt.

Wisconsin, Dr. Parry, 1848. Dubuque, Iowa, ex. herb. John Robinson. Illinois, H. G. French, ex. herb. Wm. Edwards. Colorado, "cañon of the Arkansas," (ex. herb. C. E. Faxon) Brandegee, 1873; W. M. Wilson, 1876. Utah, near St. George, J. E. Johnson, 1876; Dr. Palmer, 1877.

**Cheilanthes tomentosa**, LINK.

North Carolina: French Broad River, below Ashville, (ex. herb. C. E. Faxon), 1872; Paint Rock, (ex. herb. State Univ. Mich.), Prof. Harrington, Donor.

**Cheilanthes Eatoni**, BAKER.

Colorado, Brandegee, 1873-5.

**Cheilanthes Fendleri**, HOOKER.

New Mexico, Dr. Parry, 1867. Arizona, Dr. Palmer, April 25, 1876. Colorado: Brandegee, 1873-4; W. M. Wilson, 1875. California: Mt. Diablo, Dr. Gibbons, 1874; Brownsville, Yuba Co., Miss Pelton, 1875-8; North side of San Jacinto Mt. (altitude 4,500 ft.), San Diego Co., April, 1878. Cajou Pass, San Bernardino Mts., May, 1878, Wm. Stout.

NOTE.—The very fine collections of this fern made in California by Miss Pelton and Mr. Stout, have revealed its character in a new light, and shown the necessity for a broader description of it than any we now have. If we take the present descriptions literally, there are no better representative specimens of its type than those collected by Mr. Brandegee in Colorado; but in California specimens we find differences that gradually develop until, as in Mr. Stout's Cajou Pass specimens, we seem to have an entirely different fern, yet upon a careful examination of copious specimens from the localities given above, I am unable to find any appreciable line of separation. In the Colorado specimens the ovate or narrowly lanceolate brown scales are seldom prolonged at the apex into anything more than a long acuminate point, rarely overlapping the segments so as to be visible on the upper surface of the frond, while in California specimens, according to locality, the scales are more variable, usually broader in outline, though frequently only narrowly lanceolate, and varying in color, with age, from silvery white to rich deep brown, finally rusty or grey with age, with the apex prolonged into very delicate cilia that overlap the segments and are plainly visible on the upper surface of the frond. In some of Mr. Stout's specimens, especially in those from Cajou Pass, these cilia overlap the face of the segments in such profusion as to give to the face of the frond the appearance of *C. myriophylla*, and at once to suggest that species. But *C. myriophylla* is clearly separable from *C. Fendleri*, by its distinct hairy pinnules, the tomentum being attached to the segments independent of the scales, while in *C. Fendleri*, the cilia are traceable directly to the scales, of which they form a part, the segments themselves being wholly destitute of hairy appendages of any kind. The apparent difference between the California and Colorado specimens is, at first sight, so great that I was inclined at first to regard the former as a good variety—possibly as a different species from the Colorado one—but my examinations lead me now to look upon them merely as finer, and more highly developed specimens of the same species. Mr. Stout's Cajou Pass specimens have a very decided odor, as of bitter herbs, but I find the same odor in some of Miss Pelton's white *Fendleri* from Yuba Co., and also in specimens of *C. Clevelandii* from San Diego Co., and this is probably owing to something in the nature of the locality where they were gathered. Judging from the prevalence of adventitious hairs (or pappus?) on Mr. Stout's and other specimens of *Cheilanthes* from the mountainous regions of California, some species of *Compositae* grew abundantly in their neighborhood.

**Cheilanthes Clevelandii**, D. C. EATON.

San Diego Co., Cal.: Cleveland, 1875-8; Dr. Parry, 1876;  
Wm. Stout, April, 1878.

**Cheilanthes myriophylla**, DESV.

San Diego Co., Cal., Cleveland, 1875. Bartlett's Springs, Lake Co., (crevices of rocks) Cal., Miss Pelton, Aug., 1877. Sierras? J. Warren Merrill. Manitou, Colorado,? J. W. Merrill, Donor.

NOTE.—There appears to be no good reason why *C. elegans*, DESV., (referred to the present species as a *var.* by Hooker) should not yet be found in California, but the specimens sent out for that fern by Mr. Stout belong to *C. Fendleri*.—see note to that species.

**Cheilanthes Lindheimeri**, HOOKER.

Sonora, Dr. Arthur Schott, ex herb. Dr. J. F. Joor.

**CRYPTOGRAMME**. R. BR.

A genus strictly Boreal, inhabiting the northern portions of the new, and the arctic regions in the old world. Our species probably in no way distinct from the *C. crispa* of Europe. Three species only have been recorded, and these are given in Syn. Fil. Hooker and Baker as mere forms of one.

**Cryptogramme acrostichoides**, R. BR.

California: Miller (Sierras?), 1873; Mrs. Austin (Plumas Co.?), 1877; Miss Pelton (Lassen's Peak), Aug., 1878; J. Muir (Yosemite?), ex herb. Miss Pelton, 1876. Isle Royale, Mich.: (ex herb. State Univ. Mich.), July, 1868, Prof. Harrington, Donor: Henry Gillman, 1869. Colorado, Dr. Parry, 1872.

**PELLÆA**. LINK. HOOKER.**Pellæa gracilis**, HOOKER.

Lycoming Co., Penn., E. H. Whorf (ex herb. C. E. Faxon), 1878. Lyndon, Vt., J. W. Congdon, 1873. Vermont, C. G. Pringle, 1874. Mt. Toby, Mass., Rev. H. G. Jesup, 1874. Cazenovia, N. Y., Mrs. M. J. Myers, 1877. Western New York, Miss Pelton, 1876.

**Pellæa Breweri**, D. C. EATON.

California: Dr. Parry (ex herb. John Robinson), 1866-73; Hope Valley, Sierras, Dr. Anderson, 1874; Yosemite,? John Muir (ex herb. Miss Pelton), 1876.

**Pellæa Bridgesii**, HOOKER.

California: Dr. Parry, 1867; Miller, 1873; Rev. E. L. Greene (Sierra Nevada), 1874. Near Nevada Fall, Yosemite, Wm. Stout, 1876.

**Pellæa atropurpurea**, LINK.

Lawrence Co., Ala., T. M. Peters, 1873. Cliffs of the Win-

ooski, Vt., C. G. Pringle, 1874. Mt. Tobey, Mass., H. G. Jesup, 1874. Estill Co., Kentucky, John Williamson, Aug., 1878. Ohio, Miss H. J. Biddlecome, 1876. Arizona (near Fort Grant, ? ex herb. Mrs. Rust), 1877. Kansas, Mr. Packer, Donor, 1878. Onondaga Co., N. Y.: Mrs. Rust, 1876; Mrs. I. S. Gifford (bifid forms), 1878.

**Pellæa aspera**, BAKER.

(*Cheilanthes aspera*, HOOKER.)

New Mexico, Chas. Wright (ex. herb. Kew), Sir Joseph Dalton Hooker, Donor.

**Pellæa Wrightiana**, HOOKER.

Colorado (cañon of the Arkansas): Braudagee, 1873; W. M. Wilson, 1875. Plumas Co., Cal., Mrs. Ames, 1876.

**Pellæa Ornithopus**, HOOKER.

California: Miller, 1873, including a form nearly, if not identical with *Pellæa bella*, BAKER, a fern altogether too doubtfully distinct to be recognized as a good species; Dr. Anderson (Santa Cruz), 1874; Dr. Gibbons (Alameda), 1874; Mrs. Cooper (Santa Barbara), 1876-8; Mrs. Ames (Plumas Co.), 1875; Miss Pelton (Yuba Co.), 1875-8.

**Pellæa brachyptera**, BAKER.

(*P. Ornithopus*, var. *brachyptera*, D. C. EATON.)

California: Miller (Sierras?), 1873; Lemmon, 1873; Mrs. Ames (Plumas Co.), 1875; Mrs. Austin (Plumas Co.), 1875-7.

NOTE:—I have retained Baker's name for this fern as I cannot regard it otherwise than a good species. It appears to me entirely distinct from *P. Ornithopus*, with which fern I think it far less likely to be confounded than are some forms of *P. Wrightiana*. I have, during the past six years, received numerous specimens of it from the collections of Miller, Lemmon, and others, without having received anything that would suggest even its belonging to *P. Ornithopus* as a variety. I do not deny but that such specimens may exist—for specimens may be found apparently intermediate between almost any two species—but they would be most likely to occur on plants that had not sufficiently developed their specific characters to have the distinctions between the two species clearly apparent.

**Pellæa andromedæfolia**, FEE.

California: Dr. Parry, 1867; Dr. Anderson (Santa Cruz), 1874; Mrs. Cooper (Santa Barbara), 1876-8; Miss Pelton (Yuba Co.), 1875-8; Cleveland. (San Diego Co.), 1877-8.

**Pellæa flexuosa**, LINK.

Mexico, Chas. Wright, ex herb. John Robinson. Orizaba, Mexico, Chas. Mohr, 1857.

**Pellæa pulchella**, FEE.

Mexico, ex herb. John Robinson.

**Pellæa densa**, HOOKER.

California: Miller, 1873; Dr. Kellogg and W. G. W. Harford (ex herb. J. H. Redfield), 1868-9; Mrs. Austin (Phumas Co.), 1877; Miss Pelton, (Yuba Co., and Bartlett's Springs), 1875-8.

**PTERIS**. LINN.

IN this genus, and the four succeeding genera, our species are largely tropical, and, with the exceptions herein mentioned, to be looked for along the border of the Gulf of Mexico. The special localities are sufficiently indicated in the notes. *Pteris aquilina*, however, is a cosmopolite, being universally distributed throughout the globe. *Ceratopteris* has been found only in quiet waters within the tropics, and is only represented anywhere by the single species so recently added to our list of N. American ferns through the invaluable researches of Dr. Garber in southern Florida. Three species of *Adiantum*, *A. pedatum*, *A. emarginatum* and *A. tricholepis*, enter the Pacific and New Mexican range, the two last being only found (in this country) within those regions; *A. pedatum*, however, is more strictly Appalachian, and extends from Maine along our western coast to California, (Redfield, l. c.). *A. Capillus-Veneris* might almost be included in the Pacific and New Mexican range, as it occurs in southern California and Arizona. This species with us is very nearly tropical, but in Southern Utah it acquires a constitution sufficiently hardy to bear transplanting to Massachusetts, where it endures our cold winters, with but slight protection, as far north as Medford, (see note to Appendix). The *Adiantums* are to be sought for in moist, stony ravines, along the base of cliffs, on rocky hillsides, or near the banks of rivulets and waterfalls. Often pendent from the crevices of overhanging rock in limestone regions.

**Pteris longifolia**, L.

Miami, Florida, rocky ledges, open pine barrens, Dr. Garber, June, 1877.

**Pteris Cretica**, L.South Africa, McOwen, ex herb. A. H. Curtiss. Brick walls, streets of Charleston, So. Car., H. W. Ravenel, 1873. Limestone sink, with *Asplenium firmum*, near Ocala, Florida, W. H. Shoekley, 1878.

NOTE.—There is a probable doubt in regard to Mr. Ravenel's specimens, which are altogether too small to judge from positively either way, and may belong to the next species.



It may possibly turn out that we do not have *P. cretica* at all, but as Mr. Shockley's specimens, though sterile, appear to me like that species, I retain the present arrangement until this question is definitely settled.

***Pteris serrulata*, L.**

Alabama, shaded banks of rivulets, near Mobile, Chas. Mohr, May, 1878.

NOTE.—There is no doubt about the authenticity of these specimens, in whatever way their presence in that region is to be accounted for. Mr. Mohr writes that the original forest growth still exists along the banks of the stream where he found them growing, and he has been unable to trace them to any other than a natural source.

***Pteris aquilina*, L.**

Colorado, Dr. J. T. Scovill (ex herb. State Univ. Mich.), 1870. Middlesex Co., Mass., G. E. D., 1875-6. Onondaga Co., N. Y., Mrs. Barnes (a form near *var. caudata*), 1876.

***Pteris aquilina*,**

***var. caudata*, HOOKER.**

Melenville, Fla., C. E. Faxon, 1873. Harrisburg, Texas, Dr. Joor, 1875. Houston, Texas, Mrs. Young, 1875. St. Lucie River, Fla., J. D. Smith, Mich., 1877.

***Pteris aquilina*,**

***var. lanuginosa*, HOOKER.**

California: Dr. Anderson (Santa Cruz), 1874; Dr. Gibbons (Alameda), 1874; Mrs. Austin (Plumas Co.), 1876-7. Miss Pelton (Yuba Co.), July, 1877. Oregon, Willamette Slough,? Howell, July, 1875.

**CERATOPTERIS.** BRONG.

***Ceratopteris thalictroides*, BRONGNIART.**

Prairie Creek, slow moving water, Southern Florida, July, (sterile fronds) 1878. Prof. D. C. Eaton, Donor.

**ADIANTUM.** L.

***Adiantum pedatum*, L.**

California: Miller, 1873; Mrs. Austin (Plumas Co.), 1877. Middlesex Co., Mass., July, 1873; Bolton, Mass., Aug., 1874. G. E. D.

***Adiantum emarginatum*, HOOK.** (Eaton in Ferns of the South West ined.)

The *A. Chilense* of American authors, California: Santa Cruz, Dr. Anderson, 1874; Santa Barbara (Bartlett's Cañon), Mrs. Cooper, 1876-8; Plumas Co., Mrs. Ames, 1876; Yuba Co. (Brownsville), Miss Pelton, 1878; San Bernardino Mts., 1877, near Poway, San Diego Co., April and May, 1878. Wm. Stout.

I must refer to Prof. Eaton's Ferns of North America, Part XIII, for a full explanation for this change in nomenclature.

**Adiantum tricholepis**, FEE.

(*A. pilosum* D. C. EATON, incorrectly given in our Check-lists as *A. pilosum* FEE.)

NOTE.—This species is represented in the Herbarium by three fertile segments from Yucatan, kindly donated by Prof. Eaton, and a specimen of Hooker's *A. Chilense*, var. *hirsutum* from Chili—a fern which, apparently, is identical with the present species—for which I am indebted to the kindness of Sir Joseph Dalton Hooker (ex Kew herb.). Our American localities as given are Pecos River, Texas, and Monterey (Nuttall), California.

**Adiantum Capillus-Veneris**, L.

Florida, herb. W. Clark, John Robinson, Donor. Utah, near St. George, Dr. Parry, 1874. San Antonia River, Texas, Mrs. Young, 1875. Santa Barbara (Bartlett's Cañon), Cal., Mrs. Geo. M. Woodward and Mrs. Cooper, 1876; San Bernardino Mts., San Bernardino Co., Wm. Stout, April, 1877. Limestone sink, near Ocala, Florida, W. H. Shockley, Mch., 1878.

**Adiantum tenerum**, Swz. (See note, p. 40.)

Florida: Halifax River, 1877, Miss Reynolds; Ocala, Marion Co., in a limestone sink, W. H. Shockley, Mch., 1878.

Mr. Shockley's specimens are small and sterile, and there being no reason to suspect the presence of another species in Florida, at the time of receiving them, they were placed with *A. Capillus-Veneris* (see note to that species), but a re-examination shows that they are identical with Miss Reynolds' specimens and belong here.

April, 1878, Dr. Garber; Lake Monroe, J. D. Smith, 1876.

HAB.—“Boggy grounds along bayous, rich hummocks or adjacent pine lands.” Dr. Garber, l. c.

**LOMARIA**, WILLD.

Our species strictly Boreal, not uncommon in the northern regions of Europe, but occurring sparingly with us on the western border, and entering the Pacific range in southern California.

It may possibly turn out that we do not have *P. cretica* at all, but as Mr. Shockley's specimens, though sterile, appear to me like that species, I retain the present arrangement until this question is definitely settled.

***Pteris serrulata*, L.**

Alabama, shaded banks of rivulets, near Mobile. Chas. Mohr, May, 1878.

NOTE.—There is no doubt about the authenticity of these specimens, in whatever way their presence in that region is to be accounted for. Mr. Mohr writes that the original forest growth still exists along the banks of the stream where he found them growing, and he has been unable to trace them to any other than a natural source.

***Pteris aquilina*, L.**

Colorado, Dr. J. T. Scovill (ex herb. State Univ. Mich.), 1870. Middlesex Co., Mass., G. E. D., 1875-6. Onondaga Co., N. Y., Mrs. Barnes (a form near *var. caudata*), 1876.

***Pteris aquilina*,**

***var. caudata*, HOOKER.**

Meltonville, Fla., C. E. Faxon, 1873. Harrisburg, Texas, Dr. Joor, 1875. Houston, Texas, Mrs. Young, 1875. St. Lucie River, Fla., J. D. Smith, Feb. 1877.

1874. G. E. D.

***Adiantum emarginatum*, HOOK.** (Eaton in Ferns of the South West ined.)

The *A. Chilense* of American authors. California: Santa Cruz, Dr. Anderson, 1874; Santa Barbara (Bartlett's Cañon), Mrs. Cooper, 1876-8; Plumas Co., Mrs. Ames, 1876; Yuba Co. (Brownsville), Miss Pelton, 1878; San Bernardino Mts., 1877, near Poway, San Diego Co., April and May, 1878. Wm. Stout.

I must refer to Prof. Eaton's Ferns of North America, Part XIII, for a full explanation for this change in nomenclature.

**Adiantum tricholopis**, FEE.

(*A. pilosum* D. C. EATON, incorrectly given in our Check-lists as *A. pilosum* FEE.)

NOTE.—This species is represented in the Herbarium by three fertile segments from Yucatan, kindly donated by Prof. Eaton, and a specimen of Hooker's *A. Chilense*, var. *hirsutum* from Chili—a fern which, apparently, is identical with the present species—for which I am indebted to the kindness of Sir Joseph Dalton Hooker (ex Kew herb.). Our American localities as given are Pecos River, Texas, and Monterey (Nuttall), California.

**Adiantum Capillus-Veneris**, L.

Florida, herb. W. Clark, John Robinson, Donor. Utah, near St. George, Dr. Parry, 1874. San Antonia River, Texas, Mrs. Young, 1875. Santa Barbara (Bartletts Cañon), Cal., Mrs. Geo. M. Woodward and Mrs. Cooper, 1876; San Bernardino Mts., San Bernardino Co., Wm. Stout, April, 1877. Limestone sink, near Ocala, Florida, W. H. Shockley, Mich., 1878.

**VITTARIA**. SM.

In this and the next genus, the geographical range of our species is sufficiently indicated by the notes. Both species are strictly Tropical.

**Vittaria lineata**, SWARTZ.

Florida—pendent from the trunks of the palmetto—New Smyrna, ex herb. John Robinson; Geo. D. Alden, 1876; St. Augustine, J. D. Smith, Feb., 1877; Miami, Dr. Garber, June, 1877.

**BLECHNUM**. L.

**Blechnum serrulatum**, MICHX.

Florida: Enterprise, C. E. Faxon, 1873; Indian River, Dr. Palmer, 1874; East Fla., Miss Reynolds (ex herb. C. E. Faxon), Mich., 1876; Miami, July, 1877; Manatee, 1877, April, 1878, Dr. Garber; Lake Monroe, J. D. Smith, 1876.

HAB.—“Boggy grounds along bayous, rich hummocks or adjacent pine lands.” Dr. Garber, l. c.

**LOMARIA**. WILLD.

Our species strictly Boreal, not uncommon in the northern regions of Europe, but occurring sparingly with us on the western border, and entering the Pacific range in southern California.

**Lomaria Spicant**, DESV.

California: Bolander, ex herb. John Robinson; Dr. Anderson (Santa Cruz), 1874. Oregon. "Deep ravine in mountains." Howell, July, 1875.

**Lomaria Spicant**,

**var. serratum**, WOLL. (Moore's Nature Printed Ferns, Vol. II, p. 225.)

Deep mountain ravine, Multnomah Co., Oregon. Howell, Mich., 1876. Apparently a good variety. The margins are strongly and doubly serrate and in marked contrast to the entire or slightly sinuate margins of the normal form.

**WOODWARDIA. SM.**

Of the three species representing this genus with us, one, *W. radicans*, is placed by Mr. Redfield in the New Mexican division, but as it occurs within our limits in California, it comes as well within the Pacific range. The other two, *W. Virginica*, and *W. angustifolia*, are placed in the Appalachian division, but as Mr. Redfield suggests, are "rather maritime than Appalachian," and occur all along the coast region in rich swamps or marshy districts, from Mass. to Florida. *W. Virginica* occurs also in Vermont, and "in the regions bordering on the St. Lawrence and the great lakes."

**Woodwardia radicans**,

**var. Americana**, HOOKER.

California: Santa Cruz, Dr. Anderson, 1874; Alameda, Dr. Gibbons, 1874; Santa Barbara, Mrs. Cooper, 1876; Brownsville, Yuba Co., Miss Pelton, 1875.

**Woodwardia Virginica**, SMITH.

Middlesex Co., Mass., G. E. D., 1874-7. New Smyrna, Florida, 1878, ex herb. F. S. Plympton.

**Woodwardia angustifolia**, SMITH.

Hingham, Mass., Henry W. Cushing, Sept., 1873. Wading River, Long Island, N. Y., E. S. Miller, 1871. Dedham (Purgatory Swamp), Mass., G. E. D., Sept., 1874-7. Florida, (sterile fronds) herb. F. S. Plympton.

**SCOLOPENDRIUM. SM.**

Our species restricted by Mr. Redfield to the Boreal division, and "confined to a few rocky glens which open into the ancient basin of the great lakes." (Redfield, l. c.)

**Scolopendrium vulgare**, SMITH.

Chittenango Falls, Onondaga Co., N. Y.; ex herbs. John Robinson and State Univ. Mich.; S. N. Cowles, 1873; L.

M. Underwood, 1878, Jamesville (Green Lake)?; Miss Jane Hosmer, 1874; Mrs. Rust, 1876; Mrs. Barnes, 1877; Mrs. Gifford, 1878, Owen Sound (base of calcareous rocks), Ontario, Ca., Mrs. Roy, 1872-6.

NOTE.—I have been informed that this fern is becoming scarce in the two or three localities known for it in New York State, and that there is some danger of its extermination. This certainly would be regretted by every true lover of ferns. Every botanist ought to be interested in the preservation of so fine a species as this in the only localities known for it in the United States, and it is to be hoped that no one will thoughtlessly or ruthlessly hasten its destruction.

### CAMPTOSORUS. LINK.

Our solitary species apparently limited to the Appalachian district, but enjoying an extended range through the mountainous regions from Vermont, south and west.

#### *Camptosorus rhizophyllus*, LINK.

Vermont, C. G. Pringle, 1873. Pennsylvania, Black Rock Tunnel. ? John Robinson. New York, Onondaga Co.: S. N. Cowles; Mrs. Barnes (specimens with auricled bases), 1877; Mrs. Rust (specimens with irregularly sinuate or incised margins, approaching the sinuately-incised form figured by Torrey in Flora of New York), 1878. Poughkeepsie, N. Y., Clarence Lown, specimens with elongated auricled bases, Nov., 1878. Ohio, Miss H. J. Biddlecome, 1876. Lenox, Mass., C. E. Faxon, 1873. Needham, Mass., Storow Higginson, 1877. Pownel, Vt. (near State line), F. W. Morandi, Aug., 1878. Round Top, Gettysburg Battle Field, Penn., J. H. Redfield, Aug., 1878. Kentucky, John Williamson, Aug., 1878. Bethany, W. Va., E. Richardson, Oct., 1878.

NOTE.—My note on *Camptosorus* in eastern Mass., published in the Torrey Club Bulletin, VI, 206, has led to an investigation on the part of Mr. John H. Redfield and myself that is likely to result in an interesting and valuable contribution to our present knowledge of this fern. These investigations are still pending, but enough has already been collected to show that the predilection of this species for limestone formations is not nearly so great as is generally supposed. Whatever the final result of these investigations may be, the credit for having originated them belongs to Mr. Redfield, whose geographical knowledge of ferns justly entitles him to rank as one of our best authorities.

### ASPLENIUM. LINN.

This genus and the next two genera comprise very nearly one-third of our North American ferns, and one or more species occur

in each of the six geographical divisions arranged by Mr. Redfield. The smaller species occur most frequently in clefts of rock at high altitudes; the larger species, with a few exceptions, are to be sought for along stony brooks, in ravines, rich woodlands and swamps, or at the base of rocky hills and cliffs.

***Asplenium serratum*, L.**

Miami, Florida, in a dense hummock. Dr. Garber, May, 1877.

***Asplenium pinnatifidum*, Nutt.**

Alabama, Winston Co., T. M. Peters, 1873. Fairmount Park, Phil. (locality since destroyed), Penn., John Robinson. Near Philadelphia, Pa., John Mair, 1873-4. Kentucky: J. Hussey, July, 1874; Estill Co., John Williamson, Aug., 1878.

***Asplenium ebenoides*, R. R. Scott.**

Soapstone rocks, west side of Schuylkill River, above Manayunk, Pa., R. R. Scott,—a sterile frond from an original specimen, kindly donated by Jacob Stauffer. Alabama, near Havana, Miss Julia Tutwiler, ex herb. W. H. Leggett, Canaan, Conn., J. S. Adam, July, 1878. Franklin Co., Kentucky, Prof. R. W. Wildberger, 1878. John Williamson, Donor.

***Asplenium ebeneum*, Aiton.**

Middlesex Co. Mass., (including *Var. serratum*, Gray—the original specimens named by Prof. Gray, with autograph letter—Malden, Nov., 1872). G. E. D., 1872-4. Texas: Dr. Joor (Harrisburg), and Mrs. Young (San Antonio), 1875. New Smyrna, Florida, ex herb. F. S. Plympton, 1878. Oldham Co., Ky., John Williamson, Aug., 1878. Poughkeepsie, N. Y., Clarence Lown, 1878. Bethany, W. Va., E. Richardson, Oct., 1878.

NOTE.—Mrs. Young's specimens include a very distinct form with small fronds resembling those of *A. parvulum*, but not quite so rigid, and with the pinnae *very deeply incised*—*var. incisum?*—being cut clear to the rachis at the base. The specimens are not readily placed properly, and might be mistaken either for an incised form of *A. parvulum*, or for unusually developed specimens of *A. Trichomanes, var. incisum*, but the closely sessile pinnae, and distinct venation clearly place them with the present species.

***Asplenium parvulum*, Mart. & Gale.**

New Smyrna, Fla., Dr. Palmer (ex herb. C. E. Faxon), 1874. Eutaw Springs, South Carolina, H. W. Ravenel. Alabama, T. M. Peters, 1874. Ocala, Florida, W. H. Shockley, Mch., 1878.

**Asplenium Trichomanes**, L.

Middlesex Co., Mass., G. E. D., 1874.

**Asplenium Trichomanes**,**var. incisum**, MOORE. Nat. Pr. Brit. Ferns.

San Diego Co., Cal., Cleveland, 1874-8. Near Poway, San Diego Co., Wm. Stout, 1878.

**Asplenium viride**, HUDSON.

Owen Sound, Ontario, Ca. (Deep clefts of calcareous rocks), Mrs. Roy, 1871-6. Smugglers' Notch, Vt., C. G. Pringle, Aug., 1876; C. E. Faxon, 1877.

**Asplenium dentatum**, L.

Miami, Fla. (crevices of lime rocks in a rocky hummock), Dr. Garber, June, 1877. Cuba, Chas. Wright, ex herb. J. L. Bennett.

**Asplenium montanum**, WILLD.

Kentucky, near Mammoth Cave, J. Hnssey, (ex herb. D. C. Eaton), Aug., 1873. Stone Mountain, Georgia, H. W. Ravenel. Alabama, T. M. Peters, 1873-6. Pennsylvania, John Robinson. Kentucky, Grayson, Estill and Rockcastle Counties. John Williamson, Aug., 1878.

**Asplenium Bradleyi**, D. C. EATON.

Cumberland Mt., East Tennessee, F. H. Bradley, ex herb. J. H. Redfield. Kentucky: Edmonson Co., July (ex herb. A. H. Curtiss). Nolina Creek (ex herb. C. E. Faxon), J. Hussey, 1874; Estill and Rockcastle Counties, John Williamson, Aug., 1878.

**Asplenium Ruta-muraria**, L.

Drummonds Island, Northern L. Huron (ex herb. State Univ. Mich.), 1839. Prof. Harrington, Donor. Mt. Tobey, Mass., H. G. Jesup, 1873. Vermont. C. G. Pringle, 1874-5. Ohio, Miss Bidlecome, 1876.

**Asplenium septentrionale**, HOFFM.

Colorado. Cañon of the Arkansas, Brandegec, 1874.

**Asplenium firmum**, KUNZE.

Near Ocala, Marion Co., Florida, in a limestone sink, W. H. Shockley, March, 1878.

**Asplenium myriophyllum**, PRESL.

Jackson Co., Florida, in a limestone cave, A. W. Chapman, 1854.? Ocala, Marion Co., Fla., W. H. Shockley, Mch., 1878.

**Asplenium cicutarium**, SWARTZ.

Swamp near Panasopkee river, eight miles from Sumterville,



Sumter Co., Fla. (on, or near, limestone rock), Mch., 1878.  
W. H. Shockey, donor.

**Asplenium angustifolium**, MICHX.

Vermont, C. G. Pringle, 1874. Ohio, Miss Biddlecome.  
1876. North Adams, Mass., F. W. Morandi, Aug., 1878.

**Asplenium thelypteroides**, MICHX.

West Roxbury, Mass., 1873; Dedham, July, 1874. G. E. D.  
Swampscott, Mass., John Robinson, 1874. Charlotte, Ver-  
mont, C. G. Pringle, 1874.

**Asplenium Filix-fœmina**, BERNH.

California: Prof. M. W. Harrington, 1851; Miller (Sier-  
ras?), 1873; Dr. Anderson (Santa Cruz), 1873; Mrs. Ames  
and Austin (Plumas Co), 1875; Miss Pelton (Yuba Co.),  
1876. Oregon, Howell, 1876. Colorado, ex herb. State  
Univ. Mich., Prof. Harrington, Donor. New York: Onon-  
daga Co., Mrs. Rust; Oneida Co., Mrs. Myers, 1877.  
Brunswick, Me., Miss Jackson, 1874. Dedham, Mass., G.  
E. D., Aug., 1874. Wilton, N. H., (*var. cristata (crista-  
tum?) Gray*), Wm. Edwards.

*b. var. Michauxii*, METT.

Bedford Co., Va., A. H. Curtiss, 1873. Essex Co., Mass.,  
Robinson, 1876; Middlesex Co., Mass., Morandi, 1878.

*c. var. rhæticum*, MOORE. (*Polypodium rhæticum*, L.)

Essex Co., Mass., J. R. and G. E. D., July, 1873. Sudbury,  
Mass., July, 1874. Medford, 1876. G. E. D. California, Miss  
Pelton, 1877.

*d. var. laciniatum*, MOORE.

Monmouth Co., New Jersey: Miss Eliza Hosmer, Aug. 1875;  
A. B. Guilford, 1876.

NOTE.—This species has so many different forms that it  
seems difficult to say which of them would best represent the  
type. Moore in "Nature Printed Ferns" enumerates sixty-  
five varieties in Great Britain, and the species is no less prolif-  
ic of forms in this country. Indeed, from a cursory examina-  
tion of a large series of American forms in connection with  
Moore's plates and descriptions of those varieties, I think it  
possible to identify the greater number of them among our  
own plants, but as many of them rest upon unimportant char-  
acters, I am unwilling to favor carrying the recognition of  
varieties to such an extreme. It is no easy matter to draw a  
line and say just what shall, or shall not be considered as a  
good variety, but it is safe to assume that any species will ad-  
mit of much variation without departing from its normal char-  
acter, and only when such deviations are carried so far as to  
give the appearance of an entirely different plant, either in  
habit or structure, is it best to recognize them as varieties, but

even not then unless such variations are constant in their character. But while I do not favor recognizing every slight variation that occurs in the present species, there are several forms that have come under my observation that merit particular designation, and some of these I have given above.

*Variety b.* is one of the most beautiful forms in growing, and is described and figured in Lowe's Ferns, Vol. V, p. 109, pl. 37, as a distinct species. It is most readily distinguished by its very decided red stem, and might appropriately be named the red-stemmed Lady Fern. A form so distinct as to merit description as a species would seem to have some claim to be regarded as a good variety. *Var. c.* is the form sometimes called *var. angustum* on the supposition of its being Willdenow's *Aspidium angustum*, but that fern is apparently identical with the *var. Michauxii*. The present form may be known by its narrow fronds, erect and very rigid habit. The rigidity of its fronds is so marked that I have felt tempted to suggest for it the name of *var. rigidum*, but Moore's description of *var. rheticum* (Nature Printed Ferns, Vol. II, p. 35), comes so near to it that it did not seem best to introduce a new name without further examination. It is probable, however, that as used here the name may embrace forms that Moore would place under some other of his numerous varieties. The best types of this variety are to be found in exposed, sunny, and comparatively dry situations, especially along roadside banks, or by the side of stone walls in country lanes, but how far its rigid appearance may be due to such exposure I cannot say. I have seen it growing, with only some very slight modifications, in the depths of a dense swamp by the side of a normal form having fronds nearly five feet high and sixteen inches broad; its erect, narrow fronds—seldom more than four inches broad at the most—in marked contrast with the broad feathery fronds of its neighbor. As it is found in perfection late in the season, and long after the other forms have gone down under the early frosts, it apparently possesses a harder constitution than the normal forms, thus indicating organic differences that may be worthy of special investigation. *Var. d.*, described in the Bulletin of the Torrey Club, Vol. VI, pages 88 and 168, has now been growing in my garden by the side of other forms for three years and retains its character constantly. The finely lacinated small fronds with their irregular and often abruptly terminated pinnae are its distinguishing features. I have as yet only been able to obtain a single fertile frond, and as the plants were originally sterile when found (in August), it is probable that this variety seldom fruits. It is described and figured by Moore, l. c. and an excellent figure of it may be seen in Lowe's "New and Rare Ferns," plate 55.

The variety *crinata*, (*cristatum?*), found by Mr. Edwards, I am inclined to regard more as a freak than a perma-

nent variety. It is not an uncommon thing in other ferns to find specimens with the apex of the frond and pinnæ more or less crested. I have examples of this in *Aspidium spinulosum*, and such freaks have occurred on plants of *Asplenium Filix-femina* in my garden, the plants afterward resuming their normal form. I have another distinct and very elegant form, brought to me by Mr. Roscoe Frohock, who found it growing in Malden, Mass., August, 1878, that may prove to be Moore's *var. plumosum*. A similar form was found later by Mr. Henry L. Pratt, in Concord, Mass., but further investigations are needed to justify any opinion on these specimens.

In California there occurs a very remarkable variation in the shape of the sori, which become as round as in *Aspidium*. If this variation was confined to any one particular form I should be inclined to regard it as a good variety, but as it occurs in some broad feathery fronds of the normal form from Santa Cruz (Dr. Anderson), and in a more marked degree in some narrow, rigid fronds (*var. rheticum*), from Yuba Co. (Miss Pelton), it would be difficult to place it unless we discard all other differences and recognize this variation in the sori as alone worthy of special consideration. *Var. molle*, *var. ovatum*, *var. acuminatum*, *var. marinum*, *var. gracile*, and several other forms described by Moore as good varieties are distinguishable among our plants, but I cannot regard them with that favor, as they are referable to the normal forms, or to one of those here described as varieties.

#### PHEGOPTERIS. METT.

##### **Phegopteris polypodioides**, FEE.

Near Amherst, Mass., H. G. Jesup, Sept., 1872. Essex Woods, Essex, Mass., J. R. and G. E. D., July, 1874. Mount Desert, Me., 1877. Franconia, N. H., F. S. Plympton, 1876. Fayette Ridge, Me., Miss Kate Furbish, 1877. Onondaga Co., N. Y., Mrs. Barnes, 1877. Middlesex Co., Mass., G. E. D., 1878. North Adams, Mass., Morandi, Aug., 1878.

##### **Phegopteris hexagonoptera**, FEE.

Groton Junction, ? Mass., G. W. Jenks, 1872. Vermont, C. G. Pringle, 1873. Tolland, Mass., Mrs. Piper, 1873-4. Middlesex Co. (Medford), Mass., G. E. D., 1876.

##### **Phegopteris Dryopteris**, FEE.

Mt. Washington, N. H., John Robinson, 1865. Vermont, C. G. Pringle, 1873. Tolland, Mass., Mrs. Piper, 1874. Franconia, N. H., F. S. Plympton, 1876. Fayette Ridge, Me., Miss Jackson and Miss Furbish, 1877. Onondaga Co., N. Y., Mrs. Myers, 1877. North Adams, Mass., Morandi, Aug. 1878.

##### **Phegopteris alpestris**, METT.

Sierra Nevada, altitude 7,500 ft., California, Miller, 1873.

Mt. Rose, near Webber Lake, Cal.. J. G. Lemmon, Aug., 1875.

**ASPIDIUM.** Swz.**Aspidium Lonchitis**, SWARTZ.

Alaska, M. W. Harrington, 1870. Owen Sound, Ontario, Can., Mrs. Roy, 1873-6. Nottawasagee, C. W., D. A. P. Watt. Aspey Bay, Cape Breton (*Polystichum Hiuksii*, Lawson, ined.), N. S., A. M. McKay, 1876.

**Aspidium acrostichoides**, SWARTZ.

Mt. Lafayette, N. H., John Robinson, Aug., 1874. Hingham, Mass., H. W. Cushing, 1874. Middlesex Co., Mass., G. E. D., 1874. Woodstock, Vt., Mrs. Piper. Charlotte, Vt., (*var. incisum*, Gray in Ann. lyc. N. Y., 3, 238), C. G. Pringle, 1874. Onondaga Co., N. Y., Mrs. Barnes, 1877. Poughkeepsie, N. Y., (*var. incisum*), Clarence Lown, Oct., 1878.

**Aspidium munitum**, KAULF.

Cascade mountains (*var. inciso-serratum*, D. C. Eaton, "Ferns of North America" p. 188, a form corresponding to the *var. incisum* of *A. acrostichoides*), Dec. 7, 1872, and Victoria, Vancouver's Island (the normal form), Dec. 12, 1872, Prof. John Macoun. Oregon: ex herb. John Robinson, 1873; Howell, (Willamette?), Mch., 1875. California: Santa Cruz, Dr. Anderson, 1874; Mt. Diablo, Dr. Gibbons, 1874; Plumas Co. (*var. inciso-serratum*), Mrs. Austin, 1877.

**Aspidium munitum.**

**var. nudatum**, D. C. EATON. (pl. 25, fig. 2.)  
Cal., Sierras, Miller, 1873. Nevada Falls, Yosemite, Wm. Stout, 1876. Plumas Co., Mrs. Austin, 1878.

**Aspidium munitum.**

**var. imbricans**, D. C. EATON. (F. N. A., l.c. fig. 3.)  
Plumas Co., Cal., Mrs. Austin, 1877; Sierras, Miss Pelton, Aug., 1878.

**Aspidium aculeatum**, SWARTZ.

Santa Cruz, Cal., Dr. Anderson, 1874.

**Aspidium aculeatum.**

**var. Braunii**, DÖLL. KOCH.  
Near Brattleboro, Vt., C. C. Frost, 1873. Smuggler's Notch, Vt., C. G. Pringle, Aug., 1876. Jefferson, N. H., F. S. Plympton, 1877. Ontonagon, Lake Superior (ex herb. State Univ. Mich.), 1868, Prof. Harrington, Donor.

**Aspidium Thelypteris**, SWARTZ.

Middlesex Co., Mass., G. E. D., 1873-4. Miami, Florida, Dr. Garber, 1877.

**Aspidium Noveboracense**, SWARTZ.

Middlesex Co., Mass., G. E. D., 1873. New Pond, Elizabethtown, Essex Co., N. Y., Mrs. L. A. Millington, 1872. (*var. saurcoleus*). D. C. EATON. "Ferns of North America," p. 50).

**Aspidium Nevadense**, D. C. EATON.

California: Sierras, Miller, 1873; Plumas Co., Mrs. Ames, 1875-6; Mrs. Austin. "Fern Dell," 1876-7.

**Aspidium patens**, SWARTZ.

Enterprise, Florida, C. E. Faxon, April, 1873. Texas, near Harrisburg, Dr. Joor, 1875. Santa Barbara, Cal., Mrs. Cooper, 1876. Miami, Florida, Dr. Garber, June, 1878.

**Aspidium fragrans**, SWARTZ.

Wisconsin, Dr. Parry, (the original discovery in America), 1848. Lower St. Lawrence River, Prof. John Macoun, 1870. Isle Royale (ex herb. State Univ. Mich.), Prof. Harrington, Donor, 1868. Alpine Cascade, Gorham, N. H., C. E. Faxon, 1873. Crystal Cascade, White Mts., N. H., John Robinson (Discovered for the first time in New England at this locality by Mr. Robinson in 1865), Aug., 1874. Mt. Mansfield, Vt., C. G. Pringle, 1876-7.

**Aspidium spinulosum**, SWARTZ.

Concord, Mass., 1872; Purgatory Swamp, Dedham, Mass., July, 1873; South Braintree, Newton and Billerica, Mass., 1874; Middlesex Co. (Medford, Malden, etc.), 1877-S. G. E. D. Tolland, Mass. Mrs. Piper, 1873. Vermont, near Charlotte, C. G. Pringle, 1874-5. Me., near Brunswick, Miss Jackson, 1877. Lewis Co., N. Y., Mrs. Barnes (a very curious crested form, but probably only an accidental state), 1877; Oneida Co., Mrs. Myers, 1877; Onondaga Co., Mrs. Rust, 1877. Mrs. Gifford, 1878. Harwich, Mass., Henry L. Moody, 1878.

**Aspidium spinulosum**,**var. dilatatum**, GRAY.

Vermont, C. G. Pringle, 1874. Jefferson, N. H., F. S. Plympton, 1877. Oregon, Howell, 1876.

NOTE.—In my paper on *A. spinulosum* and its varieties, American Naturalist for November, 1878, (XII, 714), I was led into an error by assuming that as the ferns in Gray's Manual were elaborated by Prof. Eaton, all names without authorities belonged to him, and so wrote *var. dilatatum*, EATON, but I find in Chapman's Flora (1865) of the South-

eru States, Prof. Eaton has given the name to Gray, and so make that correction here.

**Aspidium Americanum**, DAVENPORT, Am. Nat. l. c.  
(*A. spinulosum*, var. *intermedium*, D. C. EATON in Gray's Manual.)

Hingham, Mass., H. W. Cushing, 1873; Dedham (Purgatory Swamp), C. E. Faxon, 1874; Essex Co., John Robinson; Georgetown, Mrs. C. N. S. Horner, Aug., 1875; Newton, 1877; Malden, 1878, G. E. D. Brunswick, Me., Miss Jackson, 1877. Lewis Co., N. Y., Mrs. Barnes (crested forms), 1877; Oneida Co., Mrs. Myers, 1877; Onondaga Co., Mrs. Rust, 1878. North Adams, Mass., Morandi, Aug., 1878. Mt. Desert, Me. F. S. Plympton, 1877. Bethany, W. Va., E. Richardson, Oct., 1878.

**Aspidium Boottii**, TUCKERMAN. *A. remotum*, BRAUN.?

(*A. spinulosum*, var. *Boottii*, GRAY, Manual, Ed. 2, p. 598.)  
Essex Co., Mass., John Robinson, 1873. Dedham (Purgatory Swamp), 1873, Middlesex Co., 1876-8, G. E. D. Brunswick,? Me., Miss Jackson, 1877.

NOTE.—In my paper on "*Aspidium spinulosum* and its varieties" (Amer. Nat. l. c.), I was led to consider *A. Boottii*, TUCKERMAN, and *A. remotum*, BRAUN, as identical, by an examination of a specimen of the latter at Cambridge from Braun's herbarium, and to credit Braun's name with being the oldest, on the authority of remarks in Hooker's "British Ferns," t. 22; but since the publication of my paper I have endeavored to learn the exact date of the publication of Braun's name, with the following result. The record, so far as it appears from all accessible authorities, is that in 1834 Braun first discovered in a mountain valley near Baden, specimens of a fern growing with *Aspidium Filix-mas*, and *A. spinulosum*, that he at first referred to *Aspidium rigidum* as a variety (var. *remotum*), but which he afterward designated as a species under the name of *Aspidium remotum*. Later he appears to have regarded it as a hybrid between *A. Filix-mas* and *A. spinulosum*, but finally, according to Milde, ("Fil. Eur. et. Atl." 1867), considered it a form of *A. Filix-mas*. Braun, however, does not appear to have published any description, and, unless, as Mr. Watson suggests, he may have given the name previously in some Catalogue of the Liepsic Garden, the name *Aspidium remotum* does not appear until about 1850, when it occurs for the first time in "Verjüngung," Freiburg, 1849-50. On the other hand, Tuckerman's name and description were published in Hovey's Magazine for 1843, which entitles it to the right of priority, and justifies my retaining it on stronger grounds than those given in my *spinulosum* paper. The question of identity, however, still remains in doubt. Milde held the opinion

(Nova Acta, 1858) that *A. remotum* had nothing whatever in common with *A. Boottii*, and as his opinion was based on a careful study of the anatomy of the two plants, it is entitled to the very highest consideration. In the face of the opinion of so careful and thorough an investigator as Milde, it is extremely unsafe for any one to hazard an opposite opinion without a most careful and searching investigation conducted on the same principles as those made by that eminent Cryptogamic botanist; but I cannot forbear expressing the opinion that some of the external characters pointed out by Milde as separating the two ferns are not altogether reliable, as, for example, the comparative length of the stipe, the chaffiness or stoutness of the rachis, and the degree of pinnation in the frond, all of which characters certainly vary greatly in different specimens of *A. Boottii*. The difference, however, pointed out in the number of fibre-bundles in the stipe of *A. remotum* (7), as compared with the similar structure of the stipes in *A. spinulosum* and its forms (5 fibre-bundles), is a most important one, and one not to be lightly overlooked. According to Milde, also, the indusium in *A. remotum* is without glands, whereas in *A. Boottii* the indusium is finely glandular. But as these glands frequently disappear early, and are not always present after the indusium contracts, we cannot tell how much importance to attach to Milde's statement without knowing exactly in what state his specimens were when examined. Milde, himself, in another place when speaking of *A. spinulosum* and *dilatatum*, apparently regarded the presence or absence of glands on the indusium as unimportant. I shall discuss this question more fully hereafter in a work on which I am now engaged ("New England Ferns and their Allies"); for the present I can only say that the specimen of *A. remotum* at Cambridge from Braam's herbarium—the ticket is apparently in Braam's handwriting and bears date "Anlich, Sept., 1859"—appears to me identical with our *A. Boottii*! If detached from its sheet and sent out for that fern it would be generally received without question. But in whichever way the question of identity is finally decided, its determination either way cannot affect the position of Tuckerman's name which dates with Braam's earliest name (*A. rigidum*, var. *remotum* AL. BRAM, in Doell's Rheinische Flora, 1843), and is the oldest specific name on record. The name *Aspidium Boottii*, TUCKERMAN, therefore, must remain undisturbed.

I am indebted to Mr. Serevo Watson, of Cambridge, and to Prof. Eaton for their kindness in aiding me to look up authorities.

**Aspidium cristatum**, SWARTZ.

Purgatory Swamp, Dedham, Mass., 1874. Malden, 1877-8. G. E. D. Brunswick, Me., Miss Jackson, 1877. Oneida Co., N. Y., Mrs. Myers, 1877.

**Aspidium cristatum,****var. Clintonianum, D. C. EATON.**

Brattleboro, Vt., C. C. Frost, 1873. Bristol, Vt., C. G. Pringle, 1874. Tolland, Mass., Mrs. Piper, 1874. Middlesex Co., Mass., F. W. Morandi, 1877-8.

**Aspidium cristatum,****var. Floridanum, D. C. EATON.** Mann's Cat. 1859.*Aspidium Floridanum*, D. C. EATON, in Chapman's Flora; *Nephrodium Floridanum*, HOOKER, Fil. Exot. t. 99.

Florida: Fernandina, C. E. Faxon, Feb., 1873; Jacksonville, A. H. Curtiss, 1877; Levy Co., Dr. Garber, Nov., 1877; St. Augustine, J. D. Smith, Mch., 1876.

NOTE.—I am strongly inclined to regard this fern as a good species. Its sterile fronds certainly bear a strong resemblance to *A. cristatum*, but such resemblances are not uncommon in the sterile fronds of other and distinct species. The fertile fronds, however, are very distinct, especially in their mode of fructification, from those of *A. cristatum*, and I am told by those who have had excellent opportunities for observing it in its natural state, that it appears quite different from that species in growing. As, however, I have not investigated this to my own satisfaction, I defer entirely to the judgment of Prof. Eaton, and retain the present arrangement. It is a little singular that Hooker at one time (Sp. Fil. V. 4-117) should not only have regarded his *Nephrodium remotum* (*Aspidium remotum*, A. BR.) as a variety of *Aspidium* (*Nephrodium*) *Filix-mas*—*var. y. elongatum*—thus adopting Braun's later opinion of the same fern?, but that he should also have referred his *Nephrodium Floridanum* to *A. Filix-mas*, in the same place, and to the same variety, thus assuming an identity between *Aspidium remotum* and *Aspidium Floridanum* that could hardly have existed. It serves, however, to show how much confusion there has been in the minds of even our best authorities over this and Braun's fern. *Aspidium Filix-mas* seems to have been extended so as to embrace nearly every fern of its class, over which there has been the least degree of uncertainty; even the ambiguous *A. Ludovicianum* of Kunze being referred to it as a synonym for the same variety as the present fern (*var. y. Sp. Fil. l. c.*) by the eminent author herein cited. In "Synopsis Filicum" (p. 273) *N. Floridanum* is restored to specific distinction, Mr. Baker, however, in a foot-note expressing the opinion that it may only be a variety of *A. cristatum*, Swz.

**Aspidium (Nephrodium) Goldieanum, HOOKER.**

Danville, Vt., C. E. Faxon, 1873. Brattleboro, Vt., C. C. Frost, 1873. Charlotte, Vt., C. G. Pringle, 1874. Oneida, Co., New York, Mrs. Myers, 1877. North Adams, Mass., F. W. Morandi, Aug., 1878.



**Aspidium rigidum,**

**var. argutum**, D. C. EATON, in "Ferns of the South West."  
(*A. argutum*, KLF.)

California: Santa Cruz, Dr. Anderson, 1874; Alameda, Dr. Gibbons, 1874; San Diego, Cleveland, 1877; Santa Barbara, Mrs. Cooper, 1877; Miss Pelton (Yuba Co.?). 1875-7. Oregon, Willamette Slough,? Howell, 1875.

**Aspidium Filix-mas**, SWARTZ.

Central City, Colorado (ex herb. State Univ. Mich.), Dr. J. T. Seovill, 1869. Owen Sound, Ontario, Ca., Mrs. Roy, 1872. Colorado, Brandegee, 1874.

**Aspidium marginale**, SWARTZ.

Essex Co., Mass., 1873, Middlesex Co., 1874. G. E. D. Swampscott, Mass., (*var. elegans*, ROBINSON, Ferns of Essex Co., Bulletin of the Essex Institute, Vol. VII, No. 3., Mch., 1873), John Robinson. Charlotte, Vermont, C. G. Pringle, 1874. Jamesville, Onondaga Co., N. Y. (*var. minus*, UNDERWOOD, in litt.), L. M. Underwood, 1878. Mr. Underwood's variety (see Torrey Club Bulletin, VI. 266). is simply a young state of the plant!

**Aspidium unitum.**

**var. glabrum**, METT.

Melonville, Florida, C. E. Faxon, April, 1873. Lake Monroe, Fla., J. D. Smith, March, 1876.

**Aspidium juglandifolium**, KUNZE.

Mexico, ex herb. John Robinson.

**STRUTHIOPTERIS.** WILLD.

In this genus, and the next three genera, our species are mostly Boreal in character, inhabiting the northern part of the United States at high altitudes. *Struthiopteris* appears to be most abundant in mountain ravines, but occurs sparingly in comparatively low moist woodlands in eastern Massachusetts with *Onoclea*, although the latter belongs more properly to the Appalachian division, with *Cystopteris bulbifera* and *Woodsia obtusa*.

The *Woodsias* are all drought-enduring species, and thrive on exposed surfaces, or in clefts of high rock. The *Cystopteris* seek the more shady retirement of sheltered clefts in rock near cascades and waterfalls, or moist stony ravines. The delicate *C. fragilis* is not unfrequently seen along roadside banks, or by the side of old stone walls in country lanes.

**Struthiopteris Germanica**, WILLD.

Lincoln, Mass., G. E. D., Sept., 1873-6. Me., Miss Jackson,

1877. Onondaga Co.? N. Y. (a form analogous to the *var. frondosa* of *Osmunda cinnamomea*), Mrs. Rust, 1876.

## ONOCLEA. L.

*Onoclea sensibilis*, L.

West Roxbury (now Boston), Mass., Aug., 1873; Dorchester District, Boston. (including the so-called *var. obtusilobata*, TORREY) Aug., 1874; Medford, Mass., July, 1875; G. E. D. North Falmouth, Mass. (*var. obtusilobata*), Mrs. Piper, 1872. Georgetown, Mass., Mrs. Horner, 1875. Vermont, C. G. Pringle, 1874. Onondaga Co., N. Y. (*var. obtusilobata*), Mrs. Rust., 1877.

## CYSTOPTERIS. BERNH.

*Cystopteris fragilis*, BERNH.

Colorado, Dr. Scovill (ex herb. State Univ. Mich.), 1872. Prof. Harrington, Donor. California, Miller (*var. dentata*, HOOKER), 1873; Dr. Anderson, Santa Cruz, 1874; Mrs. Ames and Mrs. Austin, Plumas Co. (including *var. dentata*, HOOKER), 1876-7; J. Muir, Yosemite, ex herb. Miss Pelton; Miss Pelton, Sierras, Pilot's Peak, 8,000 ft., Aug., 1877. Oregon, Howell, 1876. Colorado, Miss Pelton, 1877. West of Lake Superior, Canada, Macoun, July 23, 1872. Pictou, N. S. (*var. McKayii*, LAWSON, see Bulletin of the Torrey Botanical Club, VI, 97-115), A. A. McKay, 1875. Salmon Trout River, Lake Superior (*var. dentata*), H. Gillman, 1865. New Hampshire, Minot Pratt, 1874. Beverly, Mass., (*var. dentata*), John Robinson, 1874. Tolland, Mass., Mrs. Piper, 1874. Essex Co., Mass., 1874. Middlesex Co., 1875-6. G. E. D. Near Buffalo, N. Y., Miss Pelton, 1876. Onondaga Co., N. Y., Mrs. Rust, 1877. Hot Sulphur Springs, in Middle Park, and cavern in "Sheltered Falls," (altitude 9,000 ft.) on path to Pike's Peak, Colorado, Addison Brown, Aug. 9, 1878.

NOTE.—This species is extremely variable. I have gathered from the same roots—the plants growing in my garden—at different times, fronds that would answer very well to the descriptions of the varieties *angustata*, *dentata*, and *Dickiciana* of British Authors, as well as other forms not described. Mr. Faxon collected in New Hampshire a form answering to the *var. Dickiciana*, and a large form collected by myself in Somerville, Mass., turned black in drying as Hooker's *var. nigrescens* (the Mexican form) is said to do. Among my specimens is a form from California and Colorado (Miss Pelton and Mr. Brown), with narrowly lanceolate simply pinnate fronds (4' to 8' high), and short, ovate, almost deltoid pinnae, the two lowest pair unusually remote, the divisions of which are irregularly and laciniately cut into long

linear, or acutely toothed lobes;—*var. laciniata*. The fronds, on being held up to the light, have the appearance of being finely dissected, though in reality not so. This form is well marked and different from any other that I have seen, but it runs by a regular gradation into the normal forms. Miss Pelton's Buffalo specimens and Mr. Pratt's New Hampshire specimens are identical with *C. tennis*. SENOTT. Hooker's *var. dentata* appears more abundant in the mountainous regions of California than elsewhere. But in a species so variable as this, where the most arbitrary limitations fail to fix its characters clearly, it does not seem well to separate into varieties one season forms that may escape us altogether in the next. These remarks must be understood as applying only to the external manifestations of form; Moore mentions some organic differences which I have not had time to investigate.

**Cystopteris bulbifera**, BERNH.

Lyndon, Vt., J. W. Congdon, July, 1873. Charlotte, ? Vt., C. G. Pringle, 1874. Onondaga Co., Mrs. Rust, 1877.

**Cystopteris montana**, BERNH.

Lake Superior, Macoun, 1867. Lapland, Prof. Anderson, ex herb. D. A. P. Watt. Scotland, ex herb. Mrs. Roy.

**WOODSIA.** R. Br.

**Woodsia ilvensis**, R. Br.

Melrose, Mass., 1873. Salem, 1874. G. E. D. Canada, west of Lake Superior, Macoun, 1874. Dedham, Mass., G. W. Humphrey, 1876. Vermont, C. G. Pringle, 1877. New York Island, Addison Brown, June, 1877.

**Woodsia hyperborea**, R. Br.

North shore of Lake Superior (ex herb. J. H. Redfield), Macoun. East Canada, D. A. P. Watt (ex herb. State Univ. Mich.), Prof. Harrington, Donor. Smugglers' Notch, Vt., C. G. Pringle, Aug., 1876.

**Woodsia glabella**, R. Br.

Willoughby, Vt.: Edwin Faxon, Sept., 1873; C. G. Pringle, Sept., 1874. Smugglers' Notch, Vt.: C. G. Pringle, Aug., 1876-7; C. E. Faxon, 1877.

**Woodsia scopulina**, D. C. EATON.

Colorado: Rev. E. L. Greene, 1871; Brandegee. (Sangre de Cristo) 1874; Dr. Parry, 1872-4; Miss Pelton, 1877. California, J. Muir (ex herb. Miss Pelton), 1876. Clefs of rock, Hot Sulphur Springs, Middle Park, Colorado, Addison Brown, Aug., 1878.

**Woodsia Oregana**, D. C. EATON.

Colorado: (Sierra Majuda, ex herb. C. E. Faxon), Brandegee.

June, 1873; W. M. Wilson, 1875; Miss Pelton, 1877. Wyoming Territory, Dr. Parry, 1873. Open path near "Sheltered Falls," on path to Pike's Peak, and Clear Creek Cañon, near Georgetown, Colorado, Addison Brown, Aug., 1878.

**Woodsia obtusa**, TORREY.

Middlesex Co., G. E. D., 1873-5. Essex Co.: Mrs. Horner, 1874; J. R. and G. E. D., July, 1874. Lenox Mass., C. E. F.

**NEPHROLEPIS.** SCHOTT.

A strictly Tropical genus, our species occurring in "low rich hummocks, sometimes on the cabbage palmetto." Dr. Garber, l. c.

**Nephrolepis exaltata**, SCHOTT.

Indian River, Florida: Dr. Palmer (ex herb. C. E. Faxon), 1874; J. Donnell Smith, Mich., 1877. Miami, Fla., Dr. Garber, July, 1877.

**DICKSONIA.** L'HERIT.

Our species abundant in woodlands throughout the Appalachian range.

**Dicksonia punctilobula**, KUNZE.

Middlesex Co., Mass., G. E. D., 1872-4.

**TRICHOMANES.** SMITH.

A Tropical genus, our species occurring on dripping, or in the shaded retreating crevices of overhanging rock.

**Trichomanes Petersii**, GRAY.

Winston Co., on sand rock, near Sipsey River, Ala., T. M. Peters, 1873-6.

**Trichomanes radicans**, SWARTZ.

Winston Co., Ala., T. M. Peters, 1873. Chester Co., Ky. (ex herb. D. C. Eaton), J. Hussey; Edmonson Co. (ex herbs. C. E. Faxon and A. H. Curtiss), J. Hussey, July, 1874. Rockcastle Co., Kentucky, John Williamson, Nov., 1878.

**SCHIZÆA.** SMITH.

A small genus, widely diffused, our solitary species strictly local, and confined to the pine barrens of New Jersey.

**Schizæa pusilla**, PURSH.

New Jersey: (Pine Barrens?) Prof. Asa Gray, Donor; Little Egg Harbor, July, 1865. Crowley's Brook, near Pleasant Mills, Aug., 1874. W. H. Leggett; Atsion Bottom, F. Bourguin, Sept., 1873; Miss Eliza Hosmer, Aug., 1878.

**ANEIMIA.** Swz.

A genus mostly confined to tropical America, but our two species are equally divided between the New Mexican and Tropical divisions.

**Aneimia Mexicana**, KLOTZSCH.  
New Mexico, Dr. Parry, 1852.

**Aneimia adiantifolia**, SWARTZ.  
Biscayne Bay, Fla., Dr. Palmer (ex herb. C. E. Faxon), 1874.  
Miami, Fla., "shady side of rocky ledges, open pine barrens."  
Dr. Garber, June, 1877.

**LYGODIUM.** Swz.

A genus mostly tropical, but our species Appalachian and confined to "low, moist thickets, or damp, open woods, from Massachusetts to Eastern Virginia, and even Florida." ("Ferns of North America," D. C. Eaton, Part I.) Climbing over undergrowth of every kind.

**Lygodium palmatum**, SWARTZ.  
Concord, Mass.; Miss Jane Hosmer, 1872; G. E. D., 1873-4.  
Kentucky, "Piney Branch," Rockcastle Co., John Williamson, Nov., 1878.

NOTE.—The discovery of this beautiful fern in so many localities, and in considerable abundance, relieves us of any fear for its immediate extermination through the greed of traders in its commercial value; yet we can but regard the practice of gathering every scrap of its beautiful fronds, in and out of season, and with an utter disregard of Nature's provision for nourishing the plant from season to season, as decidedly reprehensible, and as a practice to be discouraged in every way by all who truly appreciate this most graceful of all of our native ferns. From this practice it has already become rare in Concord, Mass.,—once the only known locality—and if this be persisted in too long, the ultimate extinction of the species must surely follow.

**OSMUNDA.** L.

A genus too well known to need any special notice.

**Osmunda regalis**, L.  
Middlesex Co., Mass., G. E. D., 1874-5.

NOTE.—Many botanists are still inclined to recognize the so-called *var. spectabilis*, founded on the erroneous supposition that our American plant was different from the European, the segments of which usually have auricled bases, but specimens with auricled, truncate and oblique bases to the pinnule, on the same plant, and even on the same frond, are not uncommon here.

**Osmunda Claytoniana**, L.

Longwood, Mass., G. E. D., June, 1874.

**Osmunda cinnamomea**, L.

Longwood, Mass. (including the so-called *var. frondosa* in all of its forms), June, 1874; Needham (including some remarkable rigid imbricated forms, with the segments of the pinnae greatly elongated, overlapping each other, and again pinnatifid, that might be named *var. imbricata*\* with quite as much propriety as the other state is named *var. frondosa*, but no more, for both states are, in the opinion of the best botanists, merely abnormal forms and not constant varieties), 1873; Campello (various forms of *frondosa*), June, 1873-4; G. E. D. Newton, Mass. (*frondosa* forms), F. S. Plympton, 1877.

**BOTRYCHIUM**. Swz.

The sub-order Ophioglossaceæ, which comprises the present and the next genus, is represented by one or more species in nearly all of our geographical divisions. The various species are to be sought for in upland pastures, old meadow lands, sandy plains and stony ravines, rarely in deep woods. I agree with Mr. Robinson in the opinion expressed in his recent paper in "Science News" (Botrychia not Ferns, by John Robinson, Science News, Vol. I, No. 4, p. 55.), that the Botrychiums and Ophioglossums are rather to be considered as fern-allies than as true ferns, but I retain the commonly received classification here for the convenience of the present Catalogue, and reserve an expression of my views for a work on "New England Ferns and their Allies" which I have in contemplation.

**Botrychium simplex**, HITCH.

(Embracing the different forms *simplicissimum*, LASCH, *incisum* and *angustum*, MILDE, *sub-compositum* and *compositum*, LASCH, that represent the different stages in the natural development of the plant; also Milde's *var. fallax*, which might be accepted as a variation from normal forms if it occurred in fully developed specimens, but as the specimens described by Milde, and my own, belong to the second stage of the plant's development, and would probably have changed their character in the next state, I do not see how we can recognize it as a good variety).

North shore of Lake Superior, Macoun, July, 1869. Orono, Me., F. S. Scribner, June, 1871. Wyoming Territory, Dr.

\* At the time of writing this I did not know of Milde's *var. imbricata*, described in Ferns of North America, p. 231, but I should say that that form was exactly what I have described here.

Parry, 1873. River Head, Long Island, N. Y., E. S. Miller, June 13, 1873. Yosemite, Cal., J. Muir, ex herb. Miss Pelton. Charlotte, Vt., C. G. Pringle, June, 1877. "John Brown's tract," North Woods, Lewis Co., N. Y., embracing some curious abnormal forms. Mrs. Barnes, July and August, 1877. Berlin, Mass., E. S. Wheeler and G. E. D., June, 1878. Lewis Bluff, Lake Ontario, 5 miles west of Oswego, Rev. J. Herman Wibbe, June, 1878.

**Botrychium boreale**, MILDE.

Credited to Unalaska, specimens from Sweden, ex herb. Acad. of Stockholm. A. H. Curtiss, Donor, with tracings from specimens in the Kew Herbarium. C. G. Pringle, Donor.

**Botrychium Lunaria**, SWARTZ.

Isle Royale, Mich.: 1869, ex herb. State Univ. Mich., Prof. Harrington, Donor; Henry Gillman, Aug., 1873. Jamesville Road, near Syracuse, N. Y., Miss Jane Hosmer, Mrs. Rust, and Mrs. Barnes, June, 1872-8. British America, west of the Rocky Mountains, Macoun, 1876? North shore of Lake Superior, Macoun, ex herb. D. A. P. Watt, Oxford, Connecticut, Oscar Hargar, June, 1878. West Cornwall, Conn., Dr. F. W. Hall, June, 1878.

**Botrychium matricariæfolium**, A. BRAUN.

Woodstock, Vt., Mrs. Piper, 1873. Western Vermont, A. P. Morgan, 1874. C. G. Pringle, Donor. Goshen, Conway and Deerfield, Mass., H. G. Jesup, 1873-5. Fayette Ridge, Me., Miss Furbish, 1874. Tolland, Mass., August, 1875; Sandisfield, 1876-7. Mrs. Piper, Lewis Co., N. Y., Mrs. Barnes (including Milde's varieties *sub-integrum* and *compositum*; also Angström's *var. rotundilobum*, with many rare abnormal forms), 1876-8. Onondaga Co., Mrs. Rust, 1875.

**Botrychium lanceolatum**, ANGSTRÖM.

Sudbury, Mass., G. E. D., July, 1873-4. Tolland, Mass., Mrs. Piper, July, 1873-6. Oneida Co., N. Y., Mrs. Myers, 1877.

**Botrychium ternatum**, SWARTZ.

Yellowstone Park, Lower Teton Lake, Hayden's expedition, ex herb. D. C. Eaton. California: Miller, 1873; Mrs. Austin, Phumas Co., 1876-7. Old pastures near Brattleboro, Vt., C. C. Frost, 1873. Georgetown, Mass., Mrs. Horner, Sept., 1874-5. Concord, Mass., G. E. D., 1874. Shelburne, N. H., C. E. Faxon. British America, west of Rocky Mountains, Macoun, 1876. Onondaga Co., N. Y., Mrs. Rust, 1875. Lewis Co., N. Y., Mrs. Barnes, Aug., 1875-7. Madison Co., N. Y., Mrs. Myers, 1877. Fayette Ridge, Me., Miss Furbish, 1877. Newton, Mass., F. S. Plympton, 1877. North Adams, Mass., Morandi and Frohock, 1878.

NOTE.—Under this head I have included *var. Australe* and *sub-var. intermedium*. (Ferns of North America, p. 149, D. C. Eaton.)

**Botrychium ternatum,**  
**var. lunarioides, MILDE.**

South Carolina (B. V. M.),? ex herb. Philadelphia Academy of Science, J. H. Redfield, Donor. Near Mobile, Ala., Chas. Mohr, Mch., 1879.

**Botrychium ternatum,**  
**var. obliquum, MILDE.**

Middlesex and Norfolk Counties, Mass., G. E. D., 1872-5. Vermont, near Brattleboro, C. C. Frost, 1873. Shelburne, N. H., C. E. Faxon. Georgetown, Mass., Mrs. Horner, Sept., 1874. Essex Co., John Robinson, Sept., 1877. Atlantic City ("in copses on sand hills"), New Jersey, J. H. Redfield, 1877. Fayette Ridge, Me., Miss Furbish, 1877. North Providence, R. I. (a form with three fertile spikes), J. L. Bennett, 1878, W. W. Bailey, Donor.

**Botrychium ternatum,**  
**var. dissectum, MILDE.**

Essex Co., Mass., John Robinson, Sept., 1874. Falmouth, Mass., Mrs. Piper, 1872. Long Island, N. Y., E. S. Miller, 1873. Fayette Ridge, Me., Miss Furbish, 1877.

**Botrychium Virginianum, SWARTZ.**

California, Miller, 1873. Oak (Chelsea) Island, Revere, Mass., G. E. D., June, 1873-4. Charlotte, Vt., C. G. Pringle, 1874-5. Woodstock, Vt. (*var. gracile*—*B. gracile* PURSH), Mrs. Piper. Tolland, Mass., Mrs. Piper, 1874. Onondaga Co., N. Y. (*B. gracile* PURSH), Mrs. Rust, 1876; Mrs. Barnes, Mrs. Myers, and L. M. Underwood (Chittenango Falls), 1877. Me., Miss Jackson and Miss Furbish, 1877. Poughkeepsie, N. Y., Clarence Lown, 1878.

**OPHIOGLOSSUM. L.**

**Ophioglossum vulgatum, L.**

Plymouth, Mass., Prof. John Lewis Russell (ex herb. John Robinson), 1841? Clinton, Mass., G. E. D., Aug., 1873. Hingham, Mass., H. W. Cushing, 1873. Beverly, Mass., J. R. and G. E. D., July, 1874. Charlotte, Vt., C. G. Pringle, 1873. Fayette Ridge, Me., Miss Jackson and Miss Furbish, 1877. Lewis Co.? N. Y., Mrs. Barnes; Oneida Co., Mrs. Myers, 1877. Newton, Mass., F. S. Plympton, 1877.

**Ophioglossum bulbosum, MICHX.**

Fernandina, Florida, sandy pasture opposite the Bishop School, C. E. Faxon, April, 1873. Quincy,? Fla., Dr. Chapman. Manatee, Fla., Dr. Garber, in old fields, Mch., 1878. Near Mobile, Ala., C. Mohr, Mch., 1879.



**Ophioglossum nudicaule**, L. fil.

Quincy, ? Florida, Dr. Chapman, Levy Co., Fla. ("borders of pine barren ponds"), Dr. Garber, November, 1877.

**Ophioglossum palmatum**, PLUMIER.

Upper Caloosahatchie River, Florida, trunk of Sabal Palmetto, J. Donnell Smith, Meh., 1878. Brazil, ex Kew herb. Sir Joseph Dalton Hooker, Donor.

NOTE.—The following interesting extract from a letter received from Capt. Smith, may partially explain the scarcity of this fern. "I certainly searched diligently for it on many hundreds of palmettos along the 80 miles course of the Caloosahatchie River. The only condition that I can surmise as peculiar for its growth where I found it is that that particular locality had not been ravaged by the *annual fires* which sweep over nearly all the regions where cattle are herded. In my opinion these fires have had an important influence in limiting the growth of the more tender forms of plant life (especially Musci and Hepaticæ) and have probably exterminated some species in such localities."

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## SPECIES DOUBTFULLY AMERICAN

### IN THE HERBARIUM.

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**Cheilanthes argentea**, HOOKER.

Credited to Alaska, doubtfully. Specimen from China, kindly donated by Wm. Edwards of South Natick. India, John Robinson, Donor.

**Phegopteris calcarea**, J. SM.

Said to have been found by Mr. J. L. Bennett, near Providence, R. I. (Plants of Rhode Island, Bennett, ined.), but needs confirmation. My specimens are from Germany and England, J. L. Bennett and Mrs. Roy, Donors.

NOTE.—I have received from Miss Reynolds of St. Augustine, Fla., specimens of an *Adiantum*, collected on the Halifax River in 1877, that may prove to be *Adiantum tenerum*, Swz., or some closely allied species, but as the material at hand is too meagre to permit of a positive identification, I withhold it for the present.

## APPENDIX.

Doubtful species, and species erroneously attributed to the limits embraced in this Catalogue.

**Polypodium Madrense**, J. SMITH.  
Credited to Sierra Madre.

**Gymnogramme tartarea**, DESV.  
Credited to New Mexico.

**Gymnogramme podophylla**, HOOKER.  
Credited to New Mexico and Rio Grande.

**Pteris pedata**, L.

**Adiantum Æthiopicum**, L.  
Credited to Texas and California, probably confused with some form of *A. Capillus-veneris*.

**Asplenium marinum**, L.  
Credited to Nova Scotia and New Brunswick. Said to have been collected on the coast of Newfoundland by Kendall, but needs confirmation. My specimens are from England.

**Aspidium Californicum**, D. C. EATON.  
Probably founded on some form of *A. aculeatum*, Swz.

**Aspidium Ludovicianum**, KUNZE.  
A probable form of *A. Floridanum*, or *A. patens*?

**Pellæa (Allosoms) mucronata**, D. C. EATON, and

**Pellæa longimucronata**, HOOKER.  
Sometimes given, are identical with *P. Wrightiana*, HOOKER.

**Pellæa bella**, BAKER.  
A probable form of *P. Ornithopus*, HOOKER.

**Pellæa ternifolia**, FEE.  
I find this species credited to Texas and Sierra Nevada by Hooker, in Sp. Fil. 2-142, and Syn. Fil., p. 148, but it is not unlikely that some forms of *P. Wrightiana* may have been

confused with it. Prof. Eaton writes me that he has not seen any really good and unquestionable specimens of *P. ternifolia* from our limits, but that some forms of *P. Wrightiana* might very well pass for it. The species is figured in Ic. Fil. t. 126, and in Fil. Exot. t. 15, where it appears as a very distinct fern.

## INTRODUCED SPECIES.

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### **Adiantum cuneatum**, LANGS and FISCH.

Established at Valley Falls, R. I. (Plants of Rhode Island, J. L. Bennett, ined.)

NOTE.—The appearance of a tropical fern growing in the open air so far north as Rhode Island, suggests the possibility of other species becoming established, under favorable conditions, either through accident, or design, within our limits. *Pteris serrulata* in Alabama seems so great an anomaly, that our first thought is to account for its presence there by supposing it to have escaped in some way from cultivation, or to have been placed there designedly; but there is no evidence as yet to show that it is not there naturally, nor is there really any thing strange in the presence of a tropical species anywhere within tropical regions, provided the conditions are favorable to its growth. But in the present example we have the still greater anomaly of a species strictly tropical growing within our northern region, and there can be no probability of its being there naturally. One might sooner expect to find *A. Capillus Veneris* growing naturally in Massachusetts, as that species extends into temperate regions, and with us acquires, in Utah, a constitution sufficiently hardy to endure our Massachusetts winters with, and possibly without protection. But there is not the slightest probability of its being found naturally in any part of New England, although the result of my experience in growing plants of it from Utah in the open air, in Medford, for three years is sufficient to show that it may be introduced, and, perhaps, under right conditions, become established in Eastern Massachusetts. There is a wide field for experiment in the introduction of foreign ferns into our limits, and of western, Californian, and even southern species into our eastern States, as well as in the transposition of species from one region to another, and such experiments would not only give pleasure, but increase our knowledge of the character and habit of the different species of ferns.

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