Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 21. October, 1919. No. 250.

CHANGES IN THE NOMENCLATURE OF THE GRAY'S MANUAL FERNS.

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In the course of preparing, as their second report, a preliminary list of the New England *Polypodiaceae, Schizaeaceae,* and *Osmundaceae,* the Committee on Floral Areas of the New England Botanical Club has been confronted with certain questions of taxonomy and nomenclature. As a result, the names used in their list will differ considerably from those in the 7th edition of Gray's Manual. The following has been written by way of explanation of these changes and in the hope that it may be of some service to users of the Manual to have the matter relating to them brought together in one place.

There is probably no other family of plants in which the accepted basis of classification has been so radically changed within the past few years as in the *Polypodiaceae.* The ferns, though an ancient group, have proved exceptionally conservative; their evolutionary variation has been confined within narrow limits and they present today a complex of closely inter-related groups, merging more or less into one another. They offer, therefore, especial difficulties in classification. All of the very different systems proposed by the older writers have been artificial to a greater or less degree and have suffered from laying too much emphasis on single characters or single kinds of characters. It is only within about twenty years that Diels has devised a system based on combinations of characters — a system which, so far as our present knowledge shows, seems essentially natural and which has gradually won its way to practically unanimous acceptance. It is because of these conditions in general and, in particular, of a consider-

able activity in the study of American ferns since 1908 that the changes discussed below are called for.

Aspidium.— It is a very great pity that in his work on the indispensable Index Filicum and on what promises to be his classical monograph of the shield ferns, Christensen should have overlooked the earliest valid name for this genus. The name which he took up, *Dryopteris* Adans., has long been the subject of controversy. As has several times been pointed out,[1] its publication was inadequate under the International Rules: for that reason, it was rejected by the editors of the Manual and the next earliest name known to them, *Aspidium* Sw., taken up. In 1910, however, Nieuwland discovered that there exists an entirely valid name, *Thelypteris* of Schmidel, applied to the marsh fern, *Acrostichum Thelypteris* L., and published in 1762, a year earlier than *Dryopteris*, with three or four pages of description and comment and two very excellent plates.[2]

There can be little question that this is the correct name for the shield ferns. Farwell has, indeed, put forward a rival in *Filix* Hill (1755).[3] Hill, however, merely uses the doubtful binomials *Filix Mas* and *Felix Foemina* as the headings of paragraphs in his Family Herbal containing popular descriptions in English of the male fern and the bracken respectively.[4] Such use can hardly constitute publication under any nomenclatorial code, certainly not under the International Rules. *Thelypteris* remains the earliest valid name for *Aspidium* of the Manual: and, much as one regrets adding another to the numerous names this genus has already borne, it must be taken up. Rules are of no use unless conscientiously followed.

Fernald [5] has pointed out that *Aspidium spinulosum*, var. *dilatatum*, f. *anadenium* differs from typical var. *dilatatum* of Europe not only in the absence of indusial glands but also in the characters of its scales, and that it should be regarded as a coördinate geographic variety. As such it was given a name, var. *americanum* by Fischer in 1848.

Asplenium.— the lady ferns and their allies.— Recent study has pretty conclusively shown that *Athyrium* is a good genus, differing constantly from *Asplenium* in the character of its scales, the anatomy of its stipe and its general habit and appearance. It constitutes a

[1] For instance, in Rhodora xxi. 10 (foot-note) (1919).
[2] Am. Midland Nat. i. 226 (1910).
[3] Ann. Rep. Mich. Acad. Sci. xviii. 79 (1917).
[4] Hill, Family Herbal 141 (1755).
[5] Rhodora, xvii. 44 ff. (1915).

group more primitive than the true Aspleniums and standing between them and *Thelypteris* in the evolutionary sequence, as we now construct it. The section *Athyrium*, then, of the Manual becomes a genus to which the last three species under *Asplenium* are to be transferred. Butters[1] has recently pointed out that (as in many similar cases) it is the lady fern of western America, heretofore generally known as *Athyrium* or *Asplenium cyclosorum*, not that of the eastern states, which is really conspecific with the original *A. Filix-femina* of Europe and should bear that name; and that our northeastern plants comprise two species, *A. angustum* and *A. asplenioides*, distinct from it and from each other and long ago recognized and named by Willdenow and Michaux. He also points out that *Asplenium angustifolium* and *A. acrostichoides* of the Manual belong rather with the tropical group *Diplazium* than with typical *Athyrium* (the lady ferns); but since there is doubt if *Diplazium*, though rather generally accepted, ought to be separated as a genus, it seems best to leave them, for the present at least, under the older name *Athyrium*.

Dicksonia.— The pasture fern and its congeners were long referred to *Dicksonia* because of a similarity in the structure of the indusium. They differ widely from it, however, in habit and, what is more important, in the structure of the sporangia, which is altogether that of the *Polypodiaceae*, not of the *Cyatheaceae* to which the true Dicksonias belong. Our fern should bear the name *Dennstaedtia* given it more than a century ago by Bernhardi.

Onoclea.— The two sections of *Onoclea*, as treated in the Manual, are now regarded by most authors as genera. The present writer confesses to some doubt as to the propriety of this segregation; but the weight of opinion is for it. The name *Onoclea* remains with *O. sensibilis*. The earliest generic name for the ostrich ferns, *Struthiopteris* Willd. (1809) is invalid because of an earlier *Struthiopteris* Scop. (1760). Nieuwland[2] has recently pointed out that the name usually taken up, *Matteuccia* Todaro (1866), is also long antedated by the obscurely published *Pteretis* Raf. which is the correct name for the genus. Fernald[3] has shown that the American ostrich fern is specifically distinct from the European and should bear the specific name *nodulosa*, given it by Michaux. *Pteretis nodulosa* (Michx.) Nieuwl. becomes the name for our ostrich fern.

[1] Rhodora, xix. 178ff. (1917).
[2] Am. Midland Nat. iii. 194ff. (1914).
[3] Rhodora, xvii. 161ff. (1915).

Osmunda.— The American royal fern differs from the European in the shape of its pinnules, a difference not altogether constant, but enough to make desirable its recognition as a geographic variety, *O. regalis*, var. *spectabilis* (Willd.) Gray.

Phegopteris.— From the point of view of the new classification, *Phegopteris* has always been an artificial genus. Our four northeastern species, indeed, seem, taken by themselves, to constitute a separable group; but when the related tropical species are taken into consideration, they are seen to be part of a series of forms which, in all other characters than the absence of an indusium, are readily referable to one or another sub-genus of *Thelypteris*. Diels, followed by Christensen and many others, seems to have been entirely correct in reducing *Phegopteris* to that genus; our species should be transferred to it and placed, in the Manual arrangement, between *T. noveboracensis* and *T. fragrans*.

Pteris.— *Pteridium* Scop. (1760), based on *Pteris aquilina* L., though slow to win recognition as a genus, is a very natural group, differing constantly from true *Pteris* in the usually double indusium, the anatomy of the stipe, the presence of basal trichomes instead of scales and one or two other minor characters. Scopoli's name should be taken up for our bracken. Britton[1] indeed, though accepting its segregation as a genus, retains the name *Pteris* for it, on the ground that *P. aquilina* is the type of the Linnaean genus. The only apparent reason for this is a provision in the American Code that, in the absence of other means of fixing a generic type, it should be chosen from species indigenous from the point of view of the author. There would seem to be a theoretical difficulty in determining what species are indigenous from the point of view of an author who, like Linnaeus, was describing the vegetation of the entire world; however, this need not concern followers of the International Rules. By them, the name *Pteris* must be retained for the larger, chiefly tropical group represented by *Pteris longifolia* L.

Not only the genus *Pteridium*, but its constituent species, have been slow of recognition, probably because of lack of attention to the excellent characters offered by the outer indusium, basal trichomes and pubescence. Instead of one cosmopolitan species, as so long supposed, it comprises at least six in different parts of the earth. Our bracken of the Manual region proves to be specifically distinct from

[1] Fl. Bermuda, 419 (1918).

the European in habit and characters of root-stock and indusium. Its distinctness was long ago recognized by Desvaux who gave it a name under *Pteris*. It should be known by the recently published combination, *Pteridium latiusculum* (Desv.) Maxon.

Scolopendrium.— In taking up the name *Phyllitis* for this genus, Christensen cited as its place of publication Ludwig, Instit., ed. 2. 142 (1757). Ludwig's description, however, is almost ludicrously inadequate, consisting of the single phrase "folio simplici" and applicable to the hart's-tongue rather than to any other simple-leaved fern only because of the mention under it of "*lingua cervina.*" *Phyllitis* was therefore rejected in the Manual and the well-published *Scolopendrium* Sm. (1793) substituted. It appears, however, that *Phyllitis* was well and properly published in Scopoli's Flora Carniolica (1760). It should be taken up, but with the author citation Gleditsch ex Scop. instead of Ludwig. Under *Phyllitis* the correct specific combination is *P. Scolopendrium* (L.) Newman, based on *Asplenium Scolopendrium* L.

It may be observed that, of the thirty changes here recorded, eighteen are purely nomenclatorial, due to the discovery of earlier names than those previously in use — a somewhat sad comment on the wisdom of the Brussels Congress in refusing to adopt a list of nomina conservanda in ferns.

In the following summary, the Manual names, arranged alphabetically and printed in italics, come first under each number. They are followed, immediately after the = sign, by the names to be substituted for them, printed in small capitals or, in the case of the few new combinations necessary, in bold-faced type. The accepted names are followed, in turn, by any needed synonymy in italics.

1. *Aspidium* Sw. (1801) = THELYPTERIS Schmidel, Icon. Pl. ed. 2, 45, pls. 10 and 13 (1762). *Dryopteris* Adans. Fam. Pl. ii. 20 (1763).

2. *Aspidium Boottii* = THELYPTERIS BOOTTII (Tuckerm.) Nieuwl. Am. Mid. Nat. i. 226 (1910).

3. *Aspidium cristatum* = THELYPTERIS CRISTATA (L.) Nieuwl. l. c.

4. *Aspidium cristatum,* var. *Clintonianum* = THELYPTERIS CRISTATA, var. **Clintoniana** (D. C. Eaton), n. comb. *Aspidium cristatum,* var. *Clintonianum* D. C. Eaton in Gray's Man. ed. 5, 665 (1867).

5. *Aspidium Filix-mas* = THELYPTERIS FILIX-MAS (L.) Nieuwl. l. c.

6. *Aspidium fragrans* = THELYPTERIS FRAGRANS (L.) Nieuwl. l. c.

7. *Aspidium Goldianum* = THELYPTERIS GOLDIANA (Hook.) Nieuwl. l. c.

8. *Aspidium marginale* = Thelypteris marginalis (L.) Nieuwl. l. c.

9. *Aspidium noveboracense* = Thelypteris noveboracensis (L.) Nieuwl. l. c.

10. *Aspidium simulatum* = Thelypteris simulata (Davenp.) Nieuwl. l. c.

11. *Aspidium spinulosum* = Thelypteris spinulosa (O. F. Muell.) Nieuwl. l. c.

12. *Aspidium spinulosum*, var. *concordianum* = Thelypteris spinulosa, var. **concordiana** (Davenp.), n. comb. *Nephrodium spinulosum*, var. *concordianum* Davenp. Rhodora, vi. 33 (1904).

13. *Aspidium spinulosum*, var. *dilatatum*, f. *anadenium* = Thelypteris spinulosa, var. **americana** (Fisch.), n. comb. *Aspidium spinulosum americanum* Fisch. ex Kze. Am. Journ. Sci. ser. 2, vi. 84 (1848).

14. *Aspidium spinulosum*, var. *intermedium* = Thelypteris spinulosa, var. **intermedia** (Muhl.), n. comb. *Polypodium intermedium* Muhl. ex Willd. Sp. Pl. v. 262 (1810).

15. *Aspidium Thelypteris* = Thelypteris palustris Schott, Gen. Fil. note under pl. 10 (1834). *Acrostichum Thelypteris* L. Sp. Pl. 1071 (1753).

16. *Asplenium acrostichoides* = Athyrium acrostichoides (Sw.) Diels, Nat. Pfl. i. pt. 2, 223 (1899). *Athyrium acrosticoideum* Bory in Mérat, Fl. Paris, ed. 4, i. 471 (1836) is no bar to the use of the above combination, since it was merely a renaming of the earlier *Polypodium Leseblii* Mérat and therefore invalid from its inception, being a clear case of the so-called nomen abortivum.

17. *Asplenium angustifolium* = Athyrium angustifolium (Michx.) Milde, Bot. Zeit. (1866) 376. *Asplenium angustifolium* Michx. Fl. Bor. Am. ii. 265 (1803), not Jacq. Coll. i. 121 (1786). *Asplenium pycnocarpon* Spreng. Anleit. iii. 112 (1804). *Athyrium pycnocarpon* Tidestrom, Elys. Marianum, 36 (1906).

18. *Asplenium Filix-femina* = a. Athyrium angustum (Willd.) Presl, Rel. Haenk. i. 39 (1825). *Aspidium angustum* Willd. Sp. Pl. v. 277 (1810). b. Athyrium asplenioides (Michx.) Desv. Mém. Soc. Linn. Paris, vi. 266 (1827). *Nephrodium asplenioides* Michx. Fl. Bor. Am. ii. 268 (1803).

19. *Dicksonia punctilobula* = Dennstaedtia punctilobula (Michx.) Moore Ind. Fil. xcvii (1857).

20. *Onoclea Struthiopteris* = Pteretis nodulosa (Michx.) Nieuwl.

Am. Midland Nat. iv. 334 (1916). *Onoclea nodulosa* Michx. Fl. Bor. Am. ii. 272 (1803). *Onoclea Struthiopteris* and *Matteuccia Struthiopteris* Am. auth., not *Osmunda Struthiopteris* L.

21. *Osmunda regalis* = OSMUNDA REGALIS L., var. SPECTABILIS (Willd.) Gray, Man. ed. 2, 600 (1856). *Osmunda spectabilis* Willd. Sp. Pl. v. 98 (1810).

22. *Phegopteris Dryopteris* = THELYPTERIS DRYOPTERIS (L.) Slosson ex Rydb. Fl. Rocky Mts. 1044 (1917).

23. *Phegopteris hexagonoptera* = THELYPTERIS **hexagonoptera** (Michx.), n. comb. *Polypodium hexagonopterum* Michx. Fl. Bor. Am. ii. 271 (1803).

24. *Phegopteris polypodioides* = THELYPTERIS PHEGOPTERIS (L.) Slosson ex Rydb. Fl. Rocky Mts. 1043 (1917). *Polypodium Phegopteris* L. Sp. Pl. 1089 (1753).

25. *Phegopteris Robertiana* = THELYPTERIS ROBERTIANA (Hoffm.) Slosson ex Rydb. Fl. Rocky Mts. 1044 (1917).

26. *Pteris* = PTERIDIUM Gled. ex Scop. Fl. Carn. 169 (1760).

27. *Pteris aquilina* = PTERIDIUM LATIUSCULUM (Desv.) Maxon, Am. Fern Journ. ix. 43 (1919). *Pteris latiuscula* Desv. Mém. Soc. Linn. Paris vi. 303 (1827). *Pteris aquilina* and *Pteridium aquilinum* Am. auth., not *Pteris aquilina* L.

28. *Pteris aquilina*, var. *pseudocaudata* = PTERIDIUM LATIUSCULUM, var. PSEUDOCAUDATUM (Clute) Maxon, Am. Fern Journ. ix. 44 (1919).

29. *Scolopendrium* Sm. (1793) = PHYLLITIS Gled. ex Scop. Fl. Carn. 171 (1760).

30. *Scolopendrium vulgare* = PHYLLITIS SCOLOPENDRIUM (L.) Newman, Hist. Brit. Ferns, ed. 2, 10 (1844). *Asplenium Scolopendrium* L. Sp. Pl. 1079 (1753).

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