Filices Adansonianae.

Von

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1. What is Dryopteris, Nephrodium, Polystichum and Aspidium?

There are three big genera of Ferns which are closely related and whose names were much disputed:

1. Stipes inarticulated. Indusium reniforme.

2. » » Texture of frond rigid. Indusium peltate and round.

3. » » Texture of frond more herbaceous. Indusium peltate, but more or less oblong.

To denote the first group, *Dryopteris* is chiefly used at present. *Dryopteris* was named by M. Adanson in his 'Familles des plantes', tome II. (1763) p. 20: «Paquets de fleurs ronds, disposés sur 2 rangs sous chaque division des feuilles. Enveloppe enparasal. Globules environés d'un anneau élastique.»

Above is all of his description. By »enveloppe enparasal« one can better consider it as *Aspidium* or *Polystichum*. Schott used *Dryopteris* also in 1834 and A. Gray in 1856. Since then it has been long neglected till Otto Kuntze used it in 1891. Kuntze's combinations are often too much for even a generous botanist, hence, if Mr. Christensen had not used it again, and made the laborious combinations of his 'Index Filicum', *Dryopteris* would have been buried eternally in the dust of synonyms. No botanists have ever seen Adanson's specimens, and even French botanists thought the 'Familles des plantes' were almost descriptiones nudae. The specimens, however, were kept by his direct descendants, and his sons of 4th generation sold them to the 'Muséum national d'histoire naturelle de Paris'. Prof. H. Lecomte of the Museum sent M. Metman, préparateur du Muséum to Baleine near Moulins (Allier), where is the mansion of Adanson-family, to receive them. He brought them back to Paris in November of 1923. This has given a light to the darkness of Adanson's

work. I could see his specimens of Ferns by the courtesy of Prof. Lecomte, and this is the first study of his specimens.

Dryopteris consists of 7 genera. The species are

1. *Asplenium* sp.? (very small sterile one).
2. *Athyrium alpestre*? (sterile).
3. *Cystopteris montana.*
4. *Leptogramme africanum.*
5. *Dryopteris aemulina*, *D. Filix-mas*, *D. opposita*, *D. Oreopteris*, *D. Robertiana*, *D. spinulosa*, *D. Thelypteris*, *D.* sp. ? from America, *D.* sp. ? from E. India.
6. *Nephrolepis longifolia.*
7. *Polystichum aculeatum*, *P. Braunii*, *P. lobatum*, *P. Lonchitis*, *P. varium.*

By the modern classification his *Dryopteris* has most numerous species of *Dryopteris* (in Christensen's sense): «Lorsqu'un genre est divisé en deux ou plusieurs, le nom doit être conservé et il est donné à l'une des divisions principales.»

This is Article 45 of the rules of nomenclature, and *Dryopteris* compromises with it.

Nephrodium is another name for the 1st group. The generic description was at first given in Michaux 'Flora Boreali-Americana' Tome II in 1803. It is as simple as *Dryopteris*. «Fructif. Puncta in disco frondis sparsa seu seriata, primum obtecta membranula reniformi aut lunata, hinc (servato nexu laterali) dehiscente.»

This apparently covers several genera, especially *Dryopteris* (membrana reniformi) *Athyrium* and *Cheilanthes* (lunata, servato nexu laterali). The specimens are in the Paris Museum; they are

Original (under *Polypodium* in Specimens)	My view
Nephrodium acrostichoides	*Polystichum acrostichoides*
» *Thelypteroides*	*Dryopteris noveborascens*
» *marginale*	» *marginalis*
» *punctilobulum*	*Dennstaedtia punctiloba*
» *bulbiferum*	*Cystopteris bulbifera*
» *Filix-foemina*	*Athyrium Filix-foemina*
» *asplenioides*	» »
» *cristatum*	*Dryopteris spinulosa*
» *tenue*	*Cystopteris fragilis*
» *rufidulum*	*Woodsia ilvensis*
» *lanosum*	*Cheilanthes lanosum*
» *Dryopteris*	*Dryopteris Linnaeana*

So *Nephrodium* Michaux comprises also 7 genera as *Dryopteris* of Adanson. The numbers of species are greater in *Dryopteris*, yet the re-

spective ratio is weeker than in Adanson's *Dryopteris*. The delegates of the Brussels' congress have suggested to use *Nephrodium* instead of *Dryopteris*, but *Dryopteris* is more practical than *Nephrodium* at present, by the help of Christensen's Index Filicum.

One can not overlook the farther-going discussion on *Dryopteris* done by Mr. C. A. Weatherby in Rhodora (October 1919). His opinion is that C. C. Schmidel's *Thelypteris* in Icones Plantarum ed. 2. (1762) p. 45, Pl. 10 and 13 is an earlier valid name of *Dryopteris*. One must notice, at first, that Schmidel has described it botanically distinguishing genera and species. His figures are so nice as no one can mistake with other species than *Dryopteris Thelypteris*, but no generic characteristic has been given to that. Explicatio figurarum suffixed is the explanation of the figures of *Dryopteris Thelypteris* which is designated by him as »Thelypteris palustris non ramosa«. So his *Thelypteris* is not a generic name. It is a vague significance of a group of plant. His species also can not be adopted by recent botany. Hill's *Filix* has the generic descriptions, so it is botanically better than *Thelypteris* of Schmidel.

Preceeding to Mr. Weatherby's discussion, Mr. Woynar has given a note under the title of 'Zur Nomenklatur einiger Farngattungen II. *Filix*' in 'Hedwigia' Vol. LVI. (1915) p. 381—387, in which he explained why *Thelypteris* of Schmidel should not be considered as a generic name. Messers H. Schinz and A. Thellung had also the same view as Mr. H. Woynar (see Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich LXVI. [1921]).

Aspidium is used to express the second group. This genus was described by O. Swartz in 1801, and contains 70 species; i. e. 30 *Dryopteris*, 15 *Polystichum*, 6 *Cystopteris*, 6 *Nephrolepis*, 4 *Athyrium*, 3 *Aspidium*, 2 *Oleandra*, 1 *Hemitelia*, 1 *Asplenium*, 1 *Cyclopeltis*, and 1 *Didymochlaena*. The number of *Aspidium* is only three as to the number of *Dryopteris* thirty. So, *Aspidium* should be pertained in *Dryopteris*. The best name to denote this second group is *Bathmium* which was used by Link in his 'Filicum species in Horto regio botanico Berolinensi cultae' in 1841.

Polystichum denotes the third group, now. The genus was published by Roth, both in 1799 and 1800. It involves the following species.

Polystichum	*Lonchitis*	O. K.
»	*Phegopteris*	*Dryopteris Phegopteris*
»	*montanum*	» *Oreopteris*
»	*Thelypteris*	» *Thelypteris*
»	*aculeatum*	O. K.
»	*Dryopteris*	*Dryopteris Linnaeana*
»	*Filix-mas*	» *Filix-mas*

Polystichum cristatum	*Dryopteris cristata*
» *strigosum*	» *strigosa*
» *multiflorum*	» *dilatata*
» *spinulosum*	» *spinulosa*
Polystichum? Marantae	*Woodsia ilvensis.*

This is 9 *Dryopteris*, 2 *Polystichum*, and 1 *Woodsia*. *Polystichum* of Roth, therefere, should be the synonym of *Dryopteris*. *Polystichum* became valid after Schott (Genera Filicum, 1834) and contained *Polystichum acrostichoides*, *P. aculeatum*, *P. Bridgesi*, *P. caespitosum*, *P. coriaceum*, *P. marginatum*, *P. ocellatum*, *P. rufobarbatum* and *P. setosum*. Fifteen years before Schott, Josephius Raddius described and figured *Rumohra aspidioides* in 'Synopsis Filicum Brasiliensium' and also in 1825 in his 'Plantarum Brasiliensium nova genera et species novae vel minus cognitae'. That is real *Polystichum* of the present sense.

2. Fern-collections of Adanson.

Adanson had good collections of plants, and the specimens of Ferns are also rich. The collectors are quite unknown, but the specimens cover the Ferns of Europe, Canary Islands, Cape, Bourbons, Ceylon, East-Indies, Java, West-Indies, and North- and South-America. It is pity that his specimens were kept untouched, when his genera were often the foci of systematic discussions. The genera proposed by him are *Thelypteris*, *Adiantum*, *Scolopendrium*, *Ceterac*, *Filix*, *Dryopteris*, *Polypodium*, *Hemionitis*, *Blechnum*, *Osmunda*, *Angiopteris*, *Ophioglossum*, *Palmafilix*, *Pilularia*, and *Lemma*. Among these *Thelypteris*, *Scolopendrium*, *Ceterac*, *Dryopteris*, *Angiopteris*, and *Palmafilix* are the first generic names appeared after 1753 (the year in which the epoch-making 'Species Plantarum' of Linnaeus was published).

I. *Thelypteris* (p. 20) comprises 5 genera of 3 families; the species are

1. *Alsophila microdonta.*
2. *Antrophyllum lanceolatum.*
3. *Dryopteris spinulosa* (poorest and smallest specimen), *D. Thelypteris*, *D. Linnaeana.*
4. *Pteridium aquilinum* (more than 10 specimens), *P. capense* (single pinnule).
5. *Pteris biaurita*, *P. caudata*, *P. ensiformis*, *P. gigantea*, *P. longifolia*, *P. podophylla*, *P. semipinnata.*
6. *Gleichenia rufinervis.*

Such a complicated genus make no use for taxonomy

II. *Adiantum* (p. 20) has 7 genera of 3 families; the species are

1. *Adiantum Capillus-Veneris*, *A. caudatum*, *A. curvatum*, *A. flabellatum*, *A. glaucinum*, *A. latifolium*, *A. macrophyllum*, *A. pedatum*, *A. pulverulentum*, *A. rhizophorum*.
2. *Davallia canariensis*.
3. *Dennstaedtia cicutaria*.
4. *Lindsaya orbiculata*.
5. *Hymenophyllum ciliatum*.
6. *Trichomanes digitatum*.
7. *Lygodium scandens*.

III. *Scolopendrium* (p. 20) has 5 species of 2 families; the species are

1. *Asplenium Nidus*.
2. *Phyllitis Hemionitis*, *P. scolopendrium*, *P. scolopendrium* var. *crispum*, *P. scolopendrium* var. *ramosum*.
3. *Stenochlaena sorbifolia*.
4. *Marattia fraxinea*.

The recommendation of *Scolopendrium* is another failure of the Brussels' congress. Hill's *Phyllitis* is based on the single species *Phyllitis vulgaris* (*Scolopendrium vulgare*, or *Phyllitis scolopendrium*), and is clearly exhibited by a coloured plate. Altough *Scolopendrium* has been used more often than *Phyllitis*, ancient botanists used it in very broad sense. For example, Roth (Tentamen Florae Germanicae III.) meant

Scolopendrium	*Phyllitis*	*Phyllitis*	*scolopendrium*
»	*Ceterach*	*Ceterach*	*officinalis*
»	*septentrionale*	*Asplenium*	*septentrionale*
»	*Ruta-muraria*	»	*Ruta-muraria*
»	*alternifolium*	»	*germanicum*

and Presl (Tentamen Pteridographiae) meant

Scolopendrium	*officinarum*	*Phyllitis*	*scolopendrium*
»	*sagittatum*	»	*Hemionitis*
»	*Hemionitis*	»	»
»	*longifolium*	*Triphlebia*	*longifolia*
»	*Durvillei*	*Stenochlaena*	*sorbifolia*.

We scientists should be always careful to adjust the former misleadings. If science gives in the habitual use, is better no science at all.

IV. *Filix* (p. 20) is equally bad as *Thelypteris*. It has 11 genera of 2 families; the species are

1. *Alsophila glabra*, *A. infesta*, *A. leucolepis*, *A.* sp.? (sterile).
2. *Asplenium forsiacum*, *A. fontanum*.
3. *Athyrium Filix-foemina*.

4. *Cystopteris alpina*, *C. fragilis*, *C.* sp.?
5. *Dennstaedtia* sp.?
6. *Dryopteris Linnaeana*, *D. marginalis*, *D. Oreopteris*, *D. patens*, *D. spinulosa* var. *intermedia*, *D. syrmatica*, *D.* sp.?, *D.* sp.?
7. *Goniopteris tetragona.*
8. *Leptogramme africanum.*
9. *Matteuccia Struthiopteris.*
10. *Polystichum aristatum.*
11. *Pteridium aquilinum.*

V. *Ceterac* (p. 20) is written as *Ceterach* on the labels of specimens. It contains 3 genera; the species are

1. *Ceterach officinalis.*
2. *Asplenium achilleifolium*, *A. forsiacum*, *A. lanceolatum*, *A. laserpitiifolium*, *A. marinum*, *A. Trichomanes.*
3. *Stenochlaena sorbifolia.*

So, Adanson's *Ceterac* is better considered as a synonym of *Asplenium.*

Two undescribed genera are suffixed to *Ceterach.* These are *Diceterach* and *Triceterach* which contains the following species:

Diceterach
- *Asplenium fontanum*
- » *Ruta-muraria*
- *Diplazium* sp.?
- *Notochlaena Marantae*

Triceterach
- *Asplenium fissum*
- » *nigrum*
- *Cystopteris alpina*
- *Dryopteris Phegopteris*

It is very probable that he had distinguished these genera by the divisions of fronds.

VI. *Dryopteris* (p. 20) is as shown in the preceeding chapter.

VII. *Polypodium* (p. 20) includes 4 genera of 2 families; the species are

1. *Gleichenia linearis*, *G. polypodioides.*
2. *Goniopteris vivipara.*
3. *Meniscium reticulatum.*
4. *Polypodium aureum*, *P. lycopodioides*, *P. parvulum*, *P. pectinatum*, *P. phyllitidis*, *P. repens*, *P. vulgare*, *P. vulgare* var. *cambricum*, *P. vulgare* var. *serratum.*

VIII. *Hemionitis* (p. 20) is represented by *Diplazium proliferum.*

IX. *Blechnum* (p. 20) is represented by *B. occidentale* and *B. spicant.*

X. *Osmunda* (p. 20) is the miscellany of 11 different plants; they are

Ficus scandens? (young creeper) — determined by Mr. Danguy of Paris' Museum.
Acrostichum aureum.
Asplenium septentrionale.
Blechnum spicant.
Cryptogramma crispa.
Diplazium parallelogramme.
Pellaea sp.?
Polypodium sp.?
Osmunda regalis.
Botrychium Lunaria.

XI. *Angiopteris* (p. 20) is represented by a single species *Onoclea sensibilis.*

XII. *Ophioglossum* (p. 20) is represented by a single species *Ophioglossum vulgatum.*

XIII. *Palma-Filix* (p. 21).

This genus does not present in the collections, but his descriptions accord with *Bathmium.* If *Palma-filix* is *Bathmium*, it is *Pleo-filix* of his specimens. The species is *Bathmium martinicense* (*B. macrophyllum* Link).

XIV. *Pilularia* (p. 21) is represented by *Pilularia globulifera.*

XV. *Lemma* (p. 21) comprises 2 species *Marsilea minuta* and *Marsilea quadrifolia.*

Besides these, there is one more unpublished genus *Pleopteris.* This is the miscellany of *Schizaea*, *Acrostichum*, *Matteuccia*, *Vittaria*, *Cyclophorus* etc. I will leave it out, for it has no relation to the systematic botany.

Adanson's specimens are historically interesting, yet his genera of *Filices* are «mélanges des genres», and hardly applicable to the modern systematic botany. *Scolopendrium* has lesser value than *Phyllitis* of Hill, and *Dryopteris* is ratified when backed by Christensen's 'Index Filicum'.

In *Filices*, too many genera and species were hitherto confounded, and very few of generic names are precise in the present meanings. This is, however, an unavoidable result brought fourth from the former studies when no good microscope existed. Young generations might be shocked if they would read the descriptions of male flowers of *Salvinia* by great Linnaeus. But human efforts as such made the foundations of modern sciences. We must pay respects to the investigations of ancient botanists, yet excessive trusts on them make the science out of realities. The discussion without studying the type-specimens is often worse than nothing.