STUDIES OF FERN TYPES, I

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In 1934 Carl Christensen, in his Index Filicum, Supplement III, gave the number of recognized species of ferns as 9,387, which today must be considered a conservative estimate. The new fourth supplement to the Index Filicum (1965) does not indicate the number of new species cited, but it must be well in excess of 1,000. Most of the well-known older species have numerous specific synonyms or reputed synonyms. I would guess at present that the number of species of ferns is in excess of 15,000. The Index does not list the subspecies, varieties, or forms, and not all the hybrids. I should thus estimate that more than 50,000 entities have been described in the ferns, and there are therefore a corresponding number of types.

Needless to say, the earlier botanists did not work with a concept of types in mind. A number of American workers began using the terms "type" and "cotype" (which usually meant a duplicate of the type, i.e., the present isotype) about 1900, and German fern students used "Typus" or "Original" similarly, but the formal recognition of types in the International Rules of Nomenclature did not begin until the International Botanical Congress in Cambridge in 1930. Since that time, succeeding Congresses have clarified the concepts of types, and the designation of a nomenclatural type has been mandatory since January 1, 1958.

When original descriptions are based on a single collection, naturally there is no problem as to the type, but when descriptions are based on several collections, i.e., syntypes, as is of course frequently the case, it is necessary according to the Code to designate one of the syntypes as the lectotype. This should not be done routinely, but only after a study of the taxonomy and nomenclature of the group involved. However, it is sometimes not practicable to study all of the syntypes involved; in some such cases one may be obliged to designate a lectotype, making sure that the specimen chosen agrees with the original description. As is well recognized, collections bearing the same number may be mixtures, and so each specimen must be carefully scrutinized. Duplicates of the holotype are officially designated as isotypes by the Code. No name is ascribed to duplicates

of the syntypes; the term "isosyntype" is here used;[1] although the meaning is readily evident by analogy, this term could appropriately be added to the section of the Code dealing with the nomenclature of types.

The majority of the estimated 50,000 fern names have never been properly typified by the current rules, and in fact many of the types of the older species have never been studied. Even the fern specimens in the Linnaean Herbarium in London have never been studied by an expert pteridologist, identified with current collections, or properly annotated. The types at the Royal Botanic Gardens, Kew, are partially indicated and segregated, especially those of Hooker and Baker, and some of the types in Berlin were indicated by Hieronymus, but in most herbaria the types remain unmarked, except in the case of recently described species.

In 1954, I was privileged to receive a grant from the John Simon Guggenheim Memorial Foundation to study fern types in various herbaria in Europe for a period of seven months. During this time through the courtesy of the various directors and curators I studied and photographed 8,011 fern types, mostly in Muséum National d'Histoire Naturelle, Paris, the Rijksherbarium, Leiden, and the British Museum (Natural History), London, although I visited briefly the Jardin Botanique de l'Etat, Brussels, the Conservatoire et Jardin botaniques, Genève, the Staatsinstitut für allgemeine Botanik, Hamburg, the Botanical Museum, Copenhagen, the Riksmuseet, Stockholm, the Botanisk Museum, Oslo, and the Royal Botanic Gardens, Kew. In subsequent years, under the auspices of the Smithsonian Institution, I visited Europe several times and photographed additional types in some of the herbaria mentioned above, and also in the Botanischer Garten, Zurich, the Botanisches Museum, Berlin-Dahlem, and the Royal Botanic Garden, Edinburgh. The total number of type photographs is now 13,011, but not all of these have been labeled and studied.

In 1957, I applied for and received a grant from the National Science Foundation (Grant G4080) amounting to $14,900 for the purpose of having duplicate prints made of the original 8,011 photographs that I had taken in 1954, and to have labels typed for these. Altogether more than 40,000 prints were made, which are being distributed to various institutions throughout the world as they are worked over and labeled. The money from this grant having been exhausted, I applied for and received a continuation from the National Science Foundation

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[1] Because of the numerous mixed collections some botanists have had so little faith in the authenticity of duplicate syntypes that they have referred to them jokingly as "arithmotypes."

(Grant GB–1243) for the amount of $5,750. The work of label typing is still going on.

The study of the original types, on which I made many notes, and of the photographs has served to clarify the status of many names. The types show that some species have been wrongly interpreted, having been recognized as distinct when they are actually synonyms, or vice versa. Others have been essentially relegated to the status of "species dubiae," although the types prove to be readily identifiable. Ultimately the number of described species that will permanently remain dubious is bound to be very small after all the herbaria have been combed for types, a task that will occupy fern students for a great many years. Identifying some of the old types will require experts to decipher cryptic marks on the labels and sheets, to identify old handwritings, watermarks of the old paper, and so forth. However, the locating of most types does not require quite these fine details.

The following notes are the first of a projected series discussing some of the more interesting types, especially those that involve some change in the current interpretations of the species involved. It is regrettable that the study of types should result in some changes in the specific epithets of some well-known plants, but this is inevitable. It is caused partly by the brief and inadequate descriptions of many early (especially but not exclusively) writers, and by the unwillingness of some later workers to attempt to locate and place the types of earlier writers. Although such changes are bound to be numerous they are not limitless. Ultimately a more stable nomenclature will result, although there will always be plenty of divergence of opinion when it comes to such (essentially subjective) taxonomic matters as the delimitation of genera and broad or narrow specific concepts.

The present work follows the precedent-setting work of the late C. A. Weatherby on the fern types described by Desvaux.[2] The original names are listed alphabetically, each followed by the correct name, according to the present Code of Botanical Nomenclature and according to the taxonomic system that I follow, which is essentially that of Christensen.[3]

1. ACROSTICHUM ACUMINATUM Willd. *in* L. Sp. Pl. ed. 4, 5:116. 1810=**Photinopteris acuminata** (Willd.) Morton, comb. nov.
   Lomaria speciosa Blume, Enum. Pl. Jav. 202. 1828. Type: Java, *Blume*.
   Photinopteris simplex J. Smith, London Journ. Bot. 3:403. 1841. Nomen nudum. Based on *Cuming* 64, from Luzon, Philippine Islands.

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[2] "On the types of Desvaux's American species of ferns," Contr. Gray Herb. CXIV:13–35. 1936; and "On certain type specimens in ferns," Contr. Gray Herb. CXXIV:13–22. 1939.

[3] In the Index Filicum, Suppl. III, and *in* Verdoorn, Manual of Pteridology.

Photinopteris horsfieldii J. Smith [London Journ. Bot. 3:403. 1841, nomen nudum] ex Hook. & Bauer, Gen. Fil. *t. 92*. 1842. Syntypes: Singapore, *Wallich*; Java, *Horsfield*; Luzon, *Cuming* 362.[4] In consideration of the specific epithet chosen, I select the Horsfield specimen as lectotype; it is presumably at Kew.

?*Photinopteris cumingii* Presl, Epim. Bot. 192. 1849 [1851]. Type: Mindoro, Philippine Islands, *Cuming* 362 p.p., presumably in Prague. Presl considered *Cuming* 362 a mixture, the other part being *P. horsfieldii*.

Photinopteris humboldtii Presl, Epim. Bot. 192. 1849 [1851]. Based on *Acrostichum acuminatum* Willd. An illegitimate change of specific epithet.

Photinopteris speciosa Presl, Epim. Bot. 264. 1849 [1851].

Acrostichum rigidum Wallich ex Hook. Sp. Fil. 5:281. 1864. An illegitimate change of specific epithet. Cited as synonyms are *Lomaria speciosa* Blume, *Photinopteris simplex* J. Smith, and *P. horsfieldii* J. Smith. It is to be considered as a renaming of *L. speciosa* Blume, with the same type. The Wallich name presumably appears on the sheet that was one of the syntypes of *P. horsfieldii*.

TYPE: Herb. Willdenow 19539 (B), photograph (by R. M. Tryon) US, labeled as Peru, Malaspina Expedition.

Willdenow based his *Acrostichum acuminatum* on a sterile specimen collected by the Malaspina Expedition and on the *Lingua cervina scandens citri foliis major* of Plumier (*t. 115*), from Martinique. The actual specimen studied and described by Willdenow should be given precedence as the type over the citation of a pre-Linnaean plate, just as most Swartz species of ferns were based on actual specimens, some of which were identified with plates by Plumier. The specimen in the Willdenow Herbarium is clearly *Photinopteris speciosa*. Presl renamed it *Photinopteris humboldtii*, probably going chiefly on the very different locality "Peru," stated on the sheet, but it is clear that this is a wrong locality. Many of the plants of the Malaspina Expedition (collected by Nee or Haenke) were wrongly localized as Peru or Ecuador when they really came from the Philippine Islands, as this one doubtless did. The characteristic genus *Photinopteris* is not uncommon in the Philippine Islands, but has never been found in Peru, or indeed in any place in the New World. The earliest name for this species is *Acrostichum acuminatum* Willd., and so the above new combination *P. acuminata* is needed. The different species *Acrostichum acuminatum* Poiret is also 1810, but Poiret's publication is later than Willdenow's, according to recent studies by Dr. William Stearn.

2. ACROSTICHUM LANCIFOLIUM Desvaux, Gesell. Naturf. Freund. Berlin Mag. 5:310. 1811 = **Elaphoglossum lancifolium** (Desvaux) Morton, comb. nov.

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[4] A specimen at Geneva (Morton photographs 3873, 3874) labeled "*Cuming* 352" is an error of transcription, for Cuming collected this species only once, his number 362. This sheet gives the locality as Mindoro, although Hooker and Bauer give the locality as Luzon.

Acrostichum salicifolium Willd. ex Kaulf. Enum. Fil. 58. 1824. Type: Bourbon [Réunion], *Desfontaines.*
Elaphoglossum salicifolium (Willd. ex Kaulf.) Alston, *in* Exell, Cat. Vasc. Pl. San Thomé 92. 1944.

The type of *A. lancifolium* Desv. came from Mauritius according to the original description, but the type specimen (Herb. Jussieu Cat. 1004, Morton photograph 2887) is marked "Ile de France [i.e., Mauritius] et du Bourbon [i.e., Réunion]." It was received from du Petit Thouars. The species does occur both in Mauritius and Réunion, and also in Madagascar. In the recent treatment of the ferns of Madagascar, Madame Tardieu-Blot continues to use the name *E. salicifolium*, but the epithet *lancifolium* has priority, and there appears to be no obstacle to its use.

3. ADIANTUM ACUMINATUM Desv. Ges. Naturf. Freund. Mag. Berlin 5:327. 1811=**Adiantum tetraphyllum** Humb. & Bonpl. ex Willd. *in* L. Sp. Pl., ed. 4, 5:441. 1810.
TYPE: Puerto Rico, *Ledru* (P, photograph by Weatherby, US).

Weatherby in his study of the fern types of Desvaux did not place *A. acuminatum* Desv. In the Index Filicum it is placed as a synonym of *A. villosum* L., but the type shows that it is a rather common form of *A. tetraphyllum* Humb. & Bonpl. as it occurs in Puerto Rico. The segments are obtuse, and so it may be presumed to be the form described as *A. tetraphyllum* f. *obtusa* Kuhn.[5] However, since Kuhn did not cite a type or any specimens of his forma, a lectotype will have to be selected from material in Berlin that has been identified as f. *obtusa* by Kuhn, which is presumably not the same as *A. tetraphyllum* var. *obtusum* Mett. ex Fourn. Mex. Pl. 129. 1872, a synonym of *A. pulverulentum.*

4. ADIANTUM POLITUM Humb. & Bonpl. ex Willd. *in* L. Sp. Pl. ed. 4, 5:442. 1810=**Adiantum polyphyllum** Willd. var. **politum** (Humb. & Bonpl.) Morton, comb. nov.
TYPE: Cumana, Venezuela, *Humboldt & Bonpland* (Herb. Willd. no. 20083–1, photograph Tryon, US). A second sheet in Herb. Willdenow (20083–2) was originally in folder 20085 (*A. villosum* L.) but has been reidentified as *A. politum;* it appears identical with the holotype of *A. politum,* and is doubtless a part of the same collection.

In the Index Filicum *A. politum* is listed as a dubious species. A study of the photograph of the type shows that it is closely allied to *A. polyphyllum* Willd. (type: Caracas, *Bredemeyer,* Herb. Willd. 20104–1, photograph Tryon, US), which is fully quadripinnate, or in some collections even 5-pinnate at base. The frond is merely tripinnate in *A. politum;* this may not be a fundamental distinction, but

[5] Jahrb. Bot. Gart. Berlin 1:342. 1881.

still I have not seen any specimens to match it, and so it may rank as a variety. Dr. Maxon studied the type in Berlin in 1930 and wrote: "It is a delicate plant of the *polyphyllum* alliance and looks like *A. pectinatum* Fée, with very small sori." However, it is doubtful if there is any relationship at all with *A. pectinatum*, which is somewhat similar in the division of the blade but which differs strongly in having pubescent rhachises and rhachillas; in *A. politum* (and *A. polyphyllum*) these are wholly glabrous, dark purple, smooth, and shining. A synonym of *A. polyphyllum* var. *polyphyllum* is *A. cardiochlaena* Kunze,[6] judging from the description and the comments by Kunze.

5. ADIANTUM SCHAFFNERI Fourn. Bull. Soc. Bot. France 27: 328. 1880= **A. capillus-veneris** L. (forma).

TYPE: "In montibus ca. San Luis de Potosí," Mexico, October 1877, *Schaffner* 64 (holotype P, Morton photograph 2623).

The original description is as follows:

L'envoi de M. Schaffner contient encore plusieurs espèces que je crois nouvelles, et sur lesquelles j'aurai l'occasion de revenir. Ce sont:

1. L'*Adiantum Schaffneri* (no. 64).—J'ai envoyé, il y a plusieurs mois, cette plante à M. Bommer, qui prépare une monographie du genre *Adiantum:* je regrette de n'avoir pas reçu de réponse de ce savant; mais je ne voudrais pas la décrire, de crainte de surcharger la nomenclature d'un double emploi inutile, M. Bommer pouvant lui avoir donné un autre nom dans son mémoire en cours d'impression. L'*Adiantum Schaffneri* a les pinnules de l'*A. Capillus Veneris*, mais les frondes courtes, à peine ramifiées et souvent même simplement pinnées, naissant trés serrées sur un rhizome horizontal.

As is to be seen from the above, Fournier says that he does not want to describe a new species, since Bommer may be describing the plant also, but then he goes ahead and assigns a specific epithet *Schaffneri* and gives enough description to validate a species ordinarily. Christensen accepted *A. schaffneri* as validly published, but I am inclined to reject it as invalid, under Art. 34 of the Code (1961 edition), which states that a name is not validly published when it is not accepted by the author who published it. The matter is not of great importance, since the type seems to be only a depauperate form of the common *A. capillus-veneris* with the fronds simply pinnate or slightly bipinnate only at the very base.

6. ASPIDIUM ATOMARIUM Muhl. ex Willd. *in* L. Sp. Pl. ed. 4, 5:279. 1810= **Cystopteris fragilis** (L.) Bernh. var. **mackayi** Lawson, Fern Flora of Canada 233. 1889.

In the Index Filicum and also in Broun's Index to North American Ferns this species is listed as a synonym of *Cystopteris bulbifera*

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[6] Linnaea 17:569. 1843; type: Caracas, Jan.–Apr. 1842, *J. Linden*, which I have not seen.

(L.) Bernh., and it is retained there by Blasdell in his recent "A Monographic Study of the Fern Genus Cystopteris," although there is no indication that he ever saw the type or made any effort to do so. The holotype is in the Willdenow Herbarium (B), sheet no. 19822. It is a sterile plant, which is referable to *C. fragilis* rather than to *C. bulbifera*. From its locality, and general appearance, it belongs to the var. *mackayi*, which Blasdell considers a hybrid between *C. diaphana* and *C. fragilis*, which is unbelievable since one of the parents (*diaphana*) does not occur within thousands of miles of Pennsylvania.

7. ASPIDIUM ATTENUATUM Kunze ex Mettenius, Abh. Senckenb. Ges. Frankfurt 2:380. 1858[7] = **Thelypteris attenuata** (Kuntze) Morton, comb. nov. Based on *Dryopteris attenuata* Kuntze, Rev. Gen. Pl. 2:812. 1891.

Lastrea attenuata J. Smith *in* Hook. Journ. Bot. 3:412. 1841, nomen nudum.

Nephrodium attenuatum (Kunze) Baker *in* Hook. & Bak. Syn. Fil. 263. 1867, non Moore, 1858.

Dryopteris attenuata Kuntze, Rev. Gen. Pl. 2:812. 1891. New name for *Aspidium attenuatum* Kunze, non Swartz.

Dryopteris stenobasis C. Chr. Ind. Fil. 294. 1905. Based on *Aspidium attenuatum* Kunze, non Swartz. Since the name *D. attenuata* Kuntze was available and correct, *D. stenobasis* was superfluous when published and therefore illegitimate.

TYPE: Samar, Philippine Islands, *Cuming* 327 (isotype BM, Morton photograph 6451).

The basis for the validity of *Dryopteris attenuata* Kuntze is Art. 72 Note: "When a new epithet is required, an author may, if he wishes, adopt an epithet given to the taxon in an illegitimate name [here *Aspidium attenuatum* Kunze, non Swartz], if there is no obstacle to its employment in the new position or sense [here there was no available prior epithet and no previous use of the combination *Dryopteris attenuata*]; the epithet in the resultant combination is treated as new [thus here *D. attenuata* Kuntze, a new name, and not *D. attenuata* (Kunze) Kuntze]."

Copeland[8] adopts for this species the name *Cyclosorus alatellus* (Christ) Copel., based on *Nephrodium alatellum* Christ.[9] He may be right that these species are the same, but the valid use of the epithet *attenuata*, dating from 1891, has priority over *N. alatellum*, dating from 1901.

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[7] Non *Aspidium attenuatum* Swartz *in* Journ. Bot. Schrad. 1800[1]:34. 1801.

[8] Gen. Fil. 142. 1947.

[9] *In* Schum. & Lauterb. Fl. Deut. Südsee 112. 1901, based on a type from New Guinea.

8. ASPIDIUM CHONTALENSE Fourn. Bull. Soc. Bot. France 19:254. 1872=**Lastreopsis exculta** (Mett.) Tindale, Vict. Nat. 73:185. 1957 subsp. **guatemalensis** (Baker) Tindale, Contr. New So. Wales Nat. Herb. 3:245. 1963.
Nephrodium guatemalense Baker *in* Hook. & Bak. Syn. Fil. ed. 2, 498. 1874.
Syntypes: Guatemala, *Salvin & Godman*; Chiapas, *Ghiesbreght* 422.
Dryopteris exculta (Mett.) C. Chr. var. *guatemalensis* (Baker) C. Chr. Dansk. Vid. Selsk. Skrift. VIII, 6:96. 1920.
TYPE (of *A. chontalense*): Chontales, Nicaragua, *Levy* 516 (holotype P, Morton photograph 4657).

In his monograph of *Dryopteris*, Christensen regarded *Aspidium chontalense* Fourn. as a dubious species, thinking it perhaps the same as *D. hemsleyana* or *D. chiriquiana*. An examination of the holotype shows that it goes in a different section from these species, and is in fact identical with the rather common Central American plant usually known as *D. exculta* var. *guatemalensis*. This species, along with the closely related *D. effusa*, has been placed in a distinct genus *Paraspolystichum*, which is not sufficiently distinct from *Lastreopsis*, according to the recent treatment by Tindale.[10]

9. ASPIDIUM DIPLAZIOIDES Moritz ex Mett. Abh. Senckenb. Ges. Frankfurt 2:367. 1858=**Thelypteris diplazioides** (Moritz) Ching, Bull. Fan. Mem. Inst. Biol., Bot. 10:251. 1941.
Dryopteris diplazioides (Moritz) Kuntze, Rev. Gen. Pl. 2:812. 1891.
Dryopteris moritziana Urban, Symb. Antill. 4:21. 1903 (Illegit.).
Type (of *Aspidium diplazioides* Moritz): *Moritz* 408, from Tovar, Venezuela; the original was probably lost in Leipzig, but I have seen isotypes at Hamburg, Leiden, and Paris (Morton photographs 1211, 4712, 5277, 5278, 5279).

The new combination was published by Ching without comment, along with a large number of other new combinations, with some errors as follows:

"*T. diplazioides* (Maritz) comb. nov.
Dryopteris dipalzioides (Maritz) Urban, C. Chr. Ind. 278"

Aside from the misspellings of Moritz and *diplazioides*, the authority stated is incorrect—it should be (Moritz) Kuntze. Urban's *Dryopteris diplazioides* (Desv.) Urban was based on *Gymnogramma diplazioides* Desv., an altogether different species (C. Chr. Ind. 262). However, this wrong citation of basionym will not invalidate the combination, which is clear from the parenthetical citation of Moritz and from the page reference to Christensen's Index Filicum.

10. ASPIDIUM GERMANII L'Herminier ex Fée, Mém. Foug. 11:82, *t. 22, f. 3.* 1866=**Thelypteris kunthii** (Desv.) Morton (see p. 53).

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[10] Monograph of the genus *Lastreopsis* Ching. Contr. New So. Wales Nat. Herb. 3:249–339, pl. I–XXIII. 1965.

TYPE: Rivière Noire, Ravine-Paradis, Guadeloupe, *L'Herminier* in 1861. There are two specimens collected in Guadeloupe by L'Herminier at Paris that agree with Fée's description; they are labeled *A. germani* but can hardly be holotypes since they lack the detailed locality data cited by Fée; however, in the absence of the Fée Herbarium, perhaps lost, the one with rhizome (Morton photograph 4677) can be designated lectotype; the other one, obviously a part of the same collection is an isolectotype (Morton photograph 4426).

It has always seemed rather odd that a species as widespread and relatively distinct as *Dryopteris normalis* C. Chr. never had a name before 1910. It appears now that there are two earlier names, at least, one of which forms the basis of *Thelypteris kunthii* (see below) and the other *Aspidium germanii* Fée (originally spelled "*germani*"). The latter was considered as a dubious species by Christensen in the Index Filicum, and as dubious also in his monograph of *Dryopteris*, where it is mentioned under *D. patens* (Swartz) Kuntze but still considered dubious. The specimens selected above as lectotypes are surely *normalis*. The peculiar thing is that there does not seem to be any other material of *normalis* from Guadeloupe. However, the species has been collected on Dominica, and there is every reason to expect it to occur in Guadeloupe and the other Windward Islands.

11. ASPIDIUM INTERMEDIUM Muhl. ex Willd. *in* L. Sp. Pl. ed. 4, 5:262. 1810
=**Dryopteris intermedia** (Muhl.) A. Gray, Manual ed. 1, 630. 1848.

I have studied the holotype (Pennsylvania, *Muhlenberg*, in Herb. Willd. no. 19788, photograph by Tryon, US). It consists of three portions of fronds. The frond at the left is *Dryopteris spinulosa* (O. F. Muell.) Watt in its usual sense for the eastern United States. The two fragments at the right are *D. intermedia* in the usual sense. The two latter are hereby designated as lectotypes, and the different frond at the left excluded, although it undoubtedly formed a part of the original concept of the species. The current nomenclature is thus preserved.

12. ASPIDIUM LEVYI Fournier, Bull. Soc. Bot. France 19:255. 1872=**Thelypteris levyi** (Fourn.) Morton, comb. nov.
Dryopteris levyi Kuntze, Rev. Gen. Pl. 2:813. 1891.
Type: Chontales, Nicaragua, *Levy* 463 (Holotypus P, Morton photograph 4690).

For comments regarding the relationships of this rare species of the section *Goniopteris* see Christensen, Monograph of the Genus Dryopteris 1:211. 1913.

13. ASPIDIUM OPPOSITUM Kaulf. ex Spreng. *in* L. Syst. Veg. ed. 16, 4:108. 1827
=**Ctenitis opposita** (Kaulf.) Copel. Gen. Fil. 124. 1947 [as "*oposita*"].
Dryopteris opposita (Kaulf.) Kuntze, Rev. Gen. Pl. 2:813. 1891.

Dryopteris mascarenarum Urban, Symb. Antill. 4:14. 1903. Based on *Aspidium oppositum* Kaulf., 1827, non *A. oppositum* Swartz, 1829. Illegitimate because superfluous when published. The species *A. oppositum* Kaulf. had priority over the Swartz name, and it was properly transferred to *Dryopteris* by Kuntze.[11]

Ctenitis mascarenarum Tardieu-Blot, Notul. Syst. 15:90. 1954. Illegitimate because the earliest available specific epithet was not adopted.

The locality given by Sprengel was "C.B.S.," i.e., Cape of Good Hope, but this was an error, for this species is not known from South Africa. Most of the new Kaulfuss' species published by Sprengel were based on the collections of Sieber, and this one was evidently based on *Sieber* 36 from Mauritius (Morton photograph 5274). The species is restricted to Mauritius, Réunion, and Madagascar.

In her latest work on the ferns of Madagascar, Madame Tardieu has continued to use the name *Ctenitis mascarenarum* (1958, p. 342), apparently overlooking entirely the publication of *C. opposita* (Kaulf.) Copel.

14. ASPIDIUM SCLEROPHYLLUM Poeppig ex Spreng. *in* L. Syst. Veg. ed. 16, 4:99. 1827 = **Thelypteris sclerophylla** (Poeppig ex Spreng.) Morton, Amer. Fern Journ. 41:87. 1951.

In making the new combination I gave the basionym as *Aspidium sclerophyllum* Kunze ex Spreng. Syst. Veg. 4:99. 1827, following the usage in the Index Filicum. I remarked in a footnote that Sprengel actually attributed the species to Poeppig, but that this was presumably an error. It is true that later, in 1834, Kunze attributed the species to himself, and he may very well have provided the name for Poeppig. Still, the name is attributed to Poeppig, and there is absolutely no mention of Kunze in the original description. I have now seen two isotypes (in Leiden and Hamburg, Morton photographs 1052 and 5238, respectively) bearing original labels reading "*Aspidium sclerophyllum* En. Pl. Cub. Ms." referring to Poeppig's own unpublished manuscript on his Cuban collections. Therefore, it seems necessary to regard Poeppig as the author. The description itself was presumably provided by Sprengel. Although primarily a zoologist, Poeppig did work on his own botanical collections and published some taxonomic botanical papers. The same arguments apply to the authorities of the names *Anemia cicutaria* Poeppig, *A. cuneata* Poeppig, *Polypodium barbatum* Poeppig, and *Adiantum fructuosum* Poeppig, all of which have generally been attributed erroneously to Kunze.

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[11] Of course the name *Dryopteris opposita* (Vahl) Urban, Symb. Antill. 4:14. 1903, is illegitimate, being a later homonym of *D. opposita* (Kaulf.) Kuntze, 1891.

15. Asplenium adiantoides Lam. Encycl. M6th. 2:309. 1786.

In the Species Plantarum (1753), Linneaus proposed *Trichomanes adiantoides* as follows:

Trichomanes frondibus pinnatis: pinnis ensiformibus acuminatis inciso-serratis: serraturis bifidis. *Fl. zeyl.* 385.

Adianthum africanum rutae murariae aemulum, segmentis longioribus acutis. *Pluk.* alm. 10. *t.* 123, *f.* 6.

Filix non ramosa zeylanica, foliis adianthi in modum serratis. *Burm. zeyl.* 97, *t.* 43.

Habitat in India, Africa.

Thus, *Trichomanes adiantoides* L. was based on two elements, one from Ceylon, illustrated by Burmann from a Hermann specimen, and one from Africa, illustrated by Plukenet. These two elements are certainly not the same species, and are probably not even closely allied; the former, from Ceylon, has been known generally as *Asplenium falcatum* Lam. and the latter, from Africa, as *Asplenium praemorsum* Swartz or *A. furcatum* Thunb.

Nomenclaturally, there is an intricate problem brought on by the treatment of Lamarck, who was the first to realize that two species were involved. In 1786, Lamarck described the two species, the Ceylon plant as *Asplenium falcatum* Lam., citing the Burmann *t. 43*, and the African plant as *Asplenium adiantoides* Lam., treated as though it were a new species, although the name appears to have been adopted from Linnaeus, and Plukenet *t. 123, f. 6*, is cited as a synonym, and mention made of the fact that *Trichomanes adiantoides* L. was a mixture. If would seem that the type of *T. adiantoides* L. must be the Ceylon plant, for Linnaeus diagnosed his species in his own Flora Zeylanica in 1747 on the basis of Burmann's plate and very likely also on an actual specimen collected in Ceylon by Hermann. Lamarck was therefore unjustified in typifying the Linnaean species on the basis of the African plant illustrated by Plukenet. Instead of describing the Ceylon plant as a new species, *A. falcatum*, Lamarck should have called it *A. adiantoides* (L.) Lam., and the African plant should have been the new species (from Lamarck's information; actually, the African species had already been described unknown to Lamarck three times: as *Trichomanes aethiopicum* Burm. (1768), *Asplenium lanceolatum* Forsk. (1775), and *Acrostichum filare* Forsk. (1775)). Therefore, it appears that *A. falcatum* Lam. was an illegitimate name, since the type of *T. adiantoides* was cited in synonymy, and that *A. adiantoides* Lam. must be treated as a new species rather than a new combination, legitimate, but with legitimate prior taxonomic synonyms. The type of *A. falcatum* Lam. must be considered the same as that of *Trichomanes adiantoides* L., since it is a renaming of the Linnaean species and not a new species, and therefore it is the

t. 43 of Burmann and the Hermann specimen from Ceylon, if that is in existence.

Christensen came to this same conclusion in his Index Filicum, and attempted to remedy it by proposing for the Ceylon species (*A. falcatum*) the new combination *Asplenium adiantoides* (L.) C. Chr. (Ind. Fil. 99. 1905) (not *A. adiantoides* Lam., 1786, not Raddi, 1819, not Raoul, 1844), but of course this is illegitimate, being a later homonym thrice over, although it has still remained in use somewhat, e.g., by Tardieu in the new Flora of Madagascar. The next oldest name that is usable, and which refers to this species in a broad sense is *Asplenium polyodon* Forster (Prodr. 80. 1786).

The type of *A. adiantoides* Lam. was not indicated. Two specimens were cited, one from the Cape of Good Hope, *Sonnerat* and one from the Ile de France, *Commerson.* Finally there was also cited Peru, *Jussieu* (Herb. Jussieu Cat. 1252, P, Morton photograph 3030), but the comment "mais cette dernière est à pinnules un peu plus grandes," indicates that the Peruvian plant was not considered typical; the specimen represents a form of the American *A. praemorsum* Swartz. The Sonnerat plant is presumably the one now in the Lamarck Herbarium at Paris (Morton photograph 2752), which lacks locality data on the sheet; and it may be also the very young plant, just partially developed, which is annotated "Asplenium adiantoides, dict." (Morton photograph 2753). The Commerson specimen from Ile de France, now in the Jussieu Herbarium at Paris, is a fine, mature specimen (Morton photograph 3029); it must have been the one chiefly used in drawing up the original description; this latter specimen is here designated as lectotype. This species is widespread in both the Old and New World; it should be known at present as *Asplenium aethiopicum* (Burm.) Becherer. It is extremely variable and may be a collective species. The American plants, if they can be separated, would continue to be known as *A. praemorsum* Swartz.

The synonymy of these two species may be summarized as follows:

Asplenium aethiopicum (Burm.) Becherer, Candollea 6:23. 1935.
Trichomanes aethiopicum Burm. Fl. Cap. Prodr. 28 bis. 1768.
Asplenium lanceolatum Forsk. Fl. Aeg. Cent. VII. 185. 1775, non Huds. 1762.
Acrostichum filare Forsk. Fl. Aeg. Cent. VII. 184. 1775.
Asplenium adiantoides Lam. Encycl. Méth. 2:309. 1786.
Asplenium praemorsum Swartz, Prodr. Veg. Ind. Occ. 130. 1788.
Asplenium falsum Retz. Obs. 6:38. 1791.
Asplenium furcatum Thunb. Prodr. Fl. Cap. 172. 1800.
Asplenium filare Alston, Journ. Bot. 72:4. 1934.
Asplenium polyodon Forst. Fl. Ins. Austr. Prodr. 80. 1786.
Trichomanes adiantoides L. Sp. Pl. 2: 1098. 1753.

Asplenium falcatum Lam. Encycl. Méth. 2:306. 1786. Nom. abort.
Asplenium cultratum Gaud. Frey. Voy. Bot. 317. 1827.[12]
Asplenium intermedium Kaulf. ex Spreng. *in* L., Syst. Veg. ed. 16, 4:84. 1827, non Presl 1822.[12]
Asplenium kaulfussii Presl, Tent. Pterid. 106. 1836, non Schlecht. 1825.
Asplenium cumingii Mett. Fil. Hort. Lips. 74, *t. 12, f. 8.* 1856.[12]
Asplenium forsterianum Col. Tasm. Journ. 2:171. 1845.[12]
Tarachia haenkeana Presl, Epim. Bot. 76. 1849 (1851).[12]
Asplenium adiantoides (L.) C. Chr. Ind. Fil. 99. 1905, non Lam., 1786, non Raddi, 1819, non Raoul, 1844.

16. **Asplenium affine** Swartz var. **tanalense** Baker, Journ. Bot. Brit. & For. 18:329. 1880.
Asplenium gilpinae Baker, Journ. Linn. Soc. [London] 16:200. 1877.
Asplenium affine var. *gilpinae* Tardieu, Mém. Inst. Sci. Madagasc. 7:48. 1956.
TYPE: Tanala, Madagascar, *L. Kitching* (not seen, presumably at K).

Madame Tardieu has used the name var. *gilpinae* for this plant in her account of the ferns of Madagascar.[13] However, although the epithet *gilpinae* has priority (1877) as a species, the name var. *tanalense* (1880) has priority as a variety over *gilpinae* (1956), and consequently the name var. *tanalense* is correct, since names have priority only within their own rank.[14]

17. ASPLENIUM MACDONELLII Beddome, Journ. Bot. Brit. & For. 27:73. 1889=**Dryoathyrium macdonellii** (Beddome) Morton, comb. nov.
Cornopteris macdonellii Tardieu, Amer. Fern Journ. 48:32. 1958.
Parathyrium macdonellii Holttum, Kew Bull. 1958:449. 1959.
TYPE: Chumba Valley, Himalaya Mountains, India, 5,000 feet alt., *Macdonell* (not seen, presumably K).

For a comment on *Dryoathyrium* see under *Dryopteris forsythii-majoris* (p. 43).

18. ATHYRIUM PRAESTANS Copel. Amer. Fern Journ. 38:132. 1948=**Diplazium praestans** (Copel.) Maxon ex Morton, comb. nov.
TYPE: Chazuta, Peru, *Klug* 4002 (holotype US).

In describing this species as an *Athyrium*, Dr. Copeland was following his own views as outlined in his Genera Filicum (1947), in which the large genus *Diplazium* was reduced to a synonym of *Athyrium*. This illustrates very well the inconsistency of Copeland's views regarding genera. Sometimes, as in the Hymenophyllaceae and some groups of Polypodiaceae, he split the genera so finely that the characters are hardly more than specific, and again large and generally

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[12] Synonymous fide C. Chr. Ind. Fil. 1905.
[13] *In* Humbert, Fl. Madag. Fam. 5, 1:234. 1958.
[14] International Code of Botanical Nomenclature, 1961 ed., Art. 60.

recognized and generally distinguishable genera like *Diplazium* and *Athyrium* are lumped together with a minimum of justification and justice. Most species are readily and easily placed in *Diplazium* or *Athyrium*, and detailed study would allow the definite placement of the few species that seem at present dubious or intermediate. It seems likely that this could be done readily if fresh material becomes available, since it has been found by Manton and Sledge, Brownlie, Mehra and Bir, and others that *Athyrium* has a basic chromosome number of $x=40$ and *Diplazium* $x=41$.

Diplazium praestans, originally segregated under this name by Dr. Maxon but left unpublished, has been known only from the Departments of San Martín and Junín, Peru. It may now be reported from the Department of Loreto: San Alejandro River, Department of Loreto, Peru, July 24, 1958, *F. Woytkowski* 5118 (US). Mr. Woytkowski observed that there were 30 to 40 plants, all distinct, crowded in a small area of a wet shady forest at an elevation of about 400 meters.

19. BLECHNUM TREUBII van Alderw. van Rosenb. Bull. Dept. Agric. Indes Neerl. 18:13. 1908=**Blechnum lanceola** Swartz, Kungl. Svenska Vetens.-akad. Handl. 1817:71, *t. 3, f. 2*. 1817.

TYPE: Cultivated in the Botanical Garden, Bogor. A specimen in the Rijksherbarium labeled as "Cult. in Hort. Bog. II. K. X. 23" (Morton photograph 728) is probably authentic material, if not a part of the type.

This species was said by van Alderwerelt van Rosenburgh to have been brought to the botanical garden in Bogor from Mount Salak, Java, but this is hardly believable. No one else has ever found a similar plant growing wild in Java, but the specimen is identical with the well-known Brazilian species *Blechnum lanceola* Swartz, the most distinctive species in the subgenus *Blechnum*, the only species having a simple blade, this absolutely entire and unlobed. It must be presumed that the plant was mislabeled in Bogor, and that it really was introduced from Brazil.

20. DRYOPTERIS ARCANA Maxon & Morton, Bull. Torr. Bot. Club 65:352, *t. 11*. 1938=**Thelypteris arcana** (Maxon & Morton) Morton, comb. nov.

TYPE: Tena to Napo, Ecuador, *Mexia* 7174 (US).

21. DRYOPTERIS CONSOBRINA Maxon & Morton, Bull. Torr. Bot. Club 65:356. 1938=**Thelypteris consobrina** (Maxon & Morton) Tryon, Rhodora 69:5. 1967.

TYPE: La Merced, Peru, *Killip & Smith* 24087 (holotype US, isotype NY).

22. DRYOPTERIS ENSIFORMIS C. Chr. Dansk. Vid. Selsk. Skrift. VII, Naturv. Afd. 10(2):269, *f. 46*. 1913=**Thelypteris ensiformis** (C. Chr.) Tryon, Rhodora 69:6. 1967.

TYPE: La Palma, Costa Rica, *Tonduz* (Herb. Inst. Nat. Cost. 12533) (holotype C, isotype US).

23. DRYOPTERIS FORSYTHII-MAJORIS C. Chr. Dansk Bot. Ark. 7:63. 1932=
Dryoathyrium forsythii-majoris (C. Chr.) Morton, comb. nov.
Parathyrium forsythii-majoris Holttum, Kew Bull. 1958:449. 1959.
TYPE: Madagascar, *Forsyth Major* 169 (isotype C, Morton photograph 5685).

In 1956, Mme. Tardieu-Blot published a paper [15] on the genus *Cornopteris* Nakai, and referred a number of species to the genus that had formerly been called *Dryopteris* or other genera. The species *Dryopteris forsythii-majoris* was formally transferred to *Cornopteris* in the American Fern Journal (48:32. 1958). However, not long thereafter R. E. Holttum published [16] a paper "*Parathyrium*, a new genus of ferns, with comments on *Cornopteris* Nakai," in which he showed that the type of *Cornopteris*, *C. decurrenti-alata* (Hook.) Nakai, is closely allied to *Athyrium*, and is essentially an exindusiate *Athyrium*, whereas *C. boryana* (Willd.) Tardieu (based on *Aspidium boryanum* Willd.) and its allies constitute a different genus, allied to *Ctenitis*, for which he proposed the name *Parathyrium*. Unfortunately, he overlooked the fact that the same species *Aspidium boryanum* Willd. had already been made the type of a new genus *Dryoathyrium* Ching in 1941 as he pointed out in a subsequent paper.[17] Ching and Tagawa have transferred several species to *Dryoathyrium*, but there are several more that belong there.

24. DRYOPTERIS LINGULATA C. Chr. Dansk. Vid. Selsk. Skrift. VII. Naturv. Afd. 10(2):271. 1913=**Thelypteris lingulata** (C. Chr.) Morton, comb. nov.
TYPE: Río Hondo, Costa Rica, *Pittier* 10349 (isotype US).

25. DRYOPTERIS MINUSCULA Maxon, Kew Bull. Misc. Inf. 1932:135. 1932=
Thelypteris minuscula (Maxon) Morton, comb. nov.
TYPE: Río Dagua, near Buenaventura, Colombia, *Lehmann* 4433 (holotype K).

26. DRYOPTERIS NESIOTICA Maxon & Morton, Bull. Torr. Bot. Club 65:362, *t. 12*. 1938=**Thelypteris nesiotica** (Maxon & Morton) Morton, comb. nov.
TYPE: Trinidad, *Jenman* (holotype NY).

27. DRYOPTERIS PARVISORA C. Chr. Ark. för Bot. 14(19):5. 1916=**Dryoathyrium parvisorum** (C. Chr.) Morton, comb. nov.

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[15] "Sur le genre Cornopteris Nakai et les Cornopteris Malgaches," Mém. Inst. Sci. Madagascar, Sér. B, 7:27–32. 1956. The species *C. forsythii-majoris* is illustrated in figure I, nos. 6–8.

[16] In "Notes on Malaysian Ferns, with descriptions of a new genus and a new species," Kew Bull. 1958:447–455. 1959.

[17] "Vegetative characters distinguishing the various groups of ferns included in Dryopteris of Christensen's Index Filicum, and other ferns of similar habit and sori," Gardens' Bull., Singapore, 17:361–367. 1960.

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Cornopteris parvisora Tardieu, Amer. Fern Journ. 48:32. 1958.
Parathyrium parvisorum Holttum, Kew Bull. 1958:449. 1959.
TYPE: Moramanga, Madagascar, Oct. 1, 1912, *Afzelius & Palm* 371 (holotype not seen, presumably S).

28. DRYOPTERIS STANDLEYI Maxon & Morton, Bull. Torr. Bot. Club 65:368 1938=**Thelypteris standleyi** (Maxon & Morton) Tryon, Rhodora 69:8. 1967.
TYPE: Quiriguá, Guatemala, *Standley* 23126 (holotype US).

29. DRYOPTERIS TURRIALBAE Rosenst. Repert. Sp. Nov. Fedde 22:10. 1925=**Thelypteris turrialbae** (Rosenst.) Morton, comb. nov.
TYPE: Turrialba, Costa Rica, *Brade* 357 (isotype NY).

30. ELAPHOGLOSSUM ALATUM Gaudichaud, *in* Vaillant, Voyage Autour Monde Bonite Bot. Atlas *t. 135*. 1845–50=**Elaphoglossum gorgoneum** (Kaulf.) Brack.
Acrostichum gorgoneum Kaulf. Enum. Fil. 63. 1824. Type: Oahu, Hawaiian Islands, *Chamisso* (presumably LE).
Acrostichum sessile Fée, Gen. Fil. 43. 1852. Based on *Elaphoglossum alatum* Gaud. A renaming, because of the unavailability of the epithet *alatum* under *Acrostichum*. Not *Acrostichum alatum* Roxb. (1844) or *A. alatum* Fée (1845).
Elaphoglossum gorgoneum (Kaulf.) Brack. U.S. Expl. Exped. 16:74. 1854.
Elaphoglossum sessile (Fée) Moore, Ind. Fil. 14. 1857. Illegitimate, since the name *E. alatum* Gaud. was legitimate and available under the genus *Elaphoglossum*.

The species *Elaphoglossum sessile* (Fée) Moore is listed as dubious in Christensen's Index Filicum, and apparently has remained unplaced. As shown by the synonymy above, this name is illegitimate, since Moore did not adopt the earliest specific epithet available, namely *Elaphoglossum alatum* Gaud. Although there is no description, the plate provided by Gaudichaud, which is a fine one, with analyses, is a valid publication by Article 44 of the International Code of Botanical Nomenclature (ed. 1961). The holotype in the Muséum National d'Histoire Naturelle, Paris, has been studied (Morton photograph 4035); it is obviously referable to the distinctive endemic species of the Hawaiian Islands *E. gorgoneum*, which has priority. For additional taxonomic synonyms, see Robinson, Bull. Torr. Bot. Club 39:572. 1912. The date of publication of *t. 135* of Gaudichaud is uncertain, but between 1845 and 1850.[18]

31. **Elaphoglossum pellucidum** Gaudichaud, *in* Vaillant, Voyage Autour Monde Bot. Atlas *t. 79, f. 5*. 1844.
Acrostichum micradenium Fée, Mém. Foug. 2:43. 1845.
Elaphoglossum nitidum Brack. U.S. Expl. Exped. 16:70. 1854. Type: Hawaiian Islands, Wilkes Expedition (holotype US).
Elaphoglossum micradenium (Fée) Moore, Ind. Fil. 12. 1857.

[18] See Johnston, Journ. Arn. Arb. 25:481–487. 1944.

Elaphoglossum pellucidum Gaud. was rejected in Christensen's Index Filicum in favor of *E. micradenium* (Fée) Moore, apparently because it was without a description. However, the plate with analyses provided by Gaudichaud validates the name according to the Code of Nomenclature. There is a further question regarding the date of publication, given as 1846 by Christensen. However, *t. 79* was published in 1844, according to Johnston.[19] A sheet in the herbarium in Paris collected by Gaudichaud (no. 13), from the "Iles Sandwich," September and October, 1836, on the Voyage of the Bonite, was obviously used for the illustration in the publication; this holotype is Morton photograph 4028. Although it is the holotype of *E. pellucidum* it does not bear this name. Fée's *Acrostichum micradenium* was also based on a Gaudichaud collection from the Hawaiian Islands, and the holotype is probably the same sheet as the holotype of *E. pellucidum*, or at least this sheet is an isotype.

32. GONIOPTERIS MOLLIS Fée, Gen. Fil. 252. 1852=**Thelypteris ghiesbreghtii** (Hook.) Morton, comb. nov.

Polypodium ghiesbreghtii Linden, Cat. 18. 1858 ? (not seen; nom nud.?) From the name, the type would appear to have been cultivated material, received originally from Ghiesbreght, probably from Chiapas, Mexico.

Polypodium crenatum var. *ghiesbreghtii* Hook. Sp. Fil. 5:3. 1864. Type: Tabasco, Mexico, *Linden* 1499 (as "*Gheisbeghtii*").

Polypodium ghiesbreghtii Linden ex Baker, *in* Hook. & Bak. Syn. Fil. 315. 1868.

Dryopteris ghiesbreghtii C. Chr. Ind. Fil. 267. 1905.

Dryopteris mollis (Fée) Maxon, Contr. U.S. Nat. Herb. 13:18. 1909, non *D. mollis* (Jacq.) Hieron. (1907).

TYPE: Tabasco, Mexico, *Linden* 1499 (isotype P, Morton photograph 4679).

Although *Goniopteris mollis* Fée is the earliest specific name, the epithet *mollis* may not now be transferred to *Thelypteris* because of *T. mollis* (Mett.) Tryon. This is a common species of the section *Goniopteris*, allied to *Thelypteris poiteana* (Bory) Proctor. Maxon knew it from Tabasco, Guatemala, and Costa Rica in 1909, but it has since been found to be quite common, and is known also from Chiapas, British Honduras, Honduras, Nicaragua, and Panama.

33. GYMNOGRAMMA POLYPODIOIDES Link, Hort. Berol. 2:50. 1833=**Thelypteris linkiana** (Presl) Tryon, Rhodora 69:6. 1967.

Gymnogramma diplazioides Desv. Mém. Soc. Linn. Paris 6:214. 1827. Type: Hispaniola, without collector (presumably P).

Grammitis linkiana Presl, Tent. Pterid. 209. 1838. Based on *Gymnogramma polypodioides* Link, Hort. Berol. 2:50. 1833, non Sprengel, 1827.

Dryopteris diplazioides Urban, Symb. Antill. 4:21. 1903, non Kuntze, 1891.

Dryopteris linkiana Maxon, Journ. Washington Acad. Sci. 14:199. 1924.

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[19] See Journ. Arn. Arb. 25:481–487. 1944. I am indebted to Mr. William T. Stearn for pointing out this Johnston reference to me.

Thelypteris diplazioides (Desv.) Proctor, Bull. Inst. Jamaica Sci. Ser. 5:59. 1953, non *T. diplazioides* (Moritz ex Mett.) Ching, Bull. Fan. Mem. Inst. Biol., Bot. 10:251. 1941.

TYPE: A cultivated specimen (presumably B).

This species has had a regrettable nomenclatural history, because of the existence of another specific epithet *diplazioides* for an entirely different species which Kuntze transferred to *Dryopteris* in 1891 as *D. diplazioides* (Moritz) Kuntze. Nevertheless, in spite of the existence of this earlier *Dryopteris diplazioides*, Urban in 1903 proposed the new combination *D. diplazioides* (Desv.) Urban, which of course was a later homonym and therefore illegitimate, but was nevertheless erroneously adopted in the Index Filicum. At the same time the perfectly valid *Dryopteris diplazioides* (Moritz) Kuntze was renamed *D. moritziana* Urban, another illegitimate name, superfluous when published, which was also recognized by Christensen. This nomenclaturally impossible treatment has inevitably created some confusion, which was continued by the publication by Mr. Proctor of yet another illegitimate combination *Thelypteris diplazioides* (Desv.) Proctor. The earliest available specific name remains *linkiana*.

34. HEMICARDION CUMINGIANUM Fée, Gen. Fil. 283. 1852=**Cyclopeltis cumingiana** (Fée) Morton, comb. nov.

Lastrea presliana J. Smith *in* Hook. Journ. Bot. 3:412. 1841, nom. nud.
Cyclopeltis presliana Berkeley, Introd. Crypt. Bot. 517. 1857.
Polystichum preslianum Moore, Ind. Fil. 84. 1857.

TYPE: Luzon, Philippine Islands, *Cuming* 68 (isotype BM, Morton photograph 6623).

Lastrea presliana J. Smith was based on "*Nephrodium semicordatum*, Presl (exclus. syn. Sw. Willd.)," evidently referring to Presl's treatment in Reliquiae Haenkeanae 32. 1825. Presl's *Nephrodium semicordatum* is a new combination based on *Polypodium semicordatum* Swartz (1788) and must have the same type, namely a plant from the West Indies. Presl did refer to the species a specimen from Luzon, but he gave no description of it apart from a general description including the American type. Therefore, there is no description in Presl to base a new species on. Smith himself gave no description, except the comment that the sori are in the middle of the venules in his *L. presliana* and are terminal in the West Indian species. In connection with his original description of the genus *Cyclopeltis*[20] Smith remarked that these characters were inadvertently reversed and that he meant to say that the sori of the West Indian species are lateral and of his *L. presliana* terminal. This cannot be taken as an adequate description of a new species, especially as the character is untrue. The sori are dorsal on the venules of both species.

[20] Bot. Mag. Curtis 72, Compend. 36. 1846.

Although the species remained a nomen nudum, the name *Cyclopeltis presliana* (J. Smith) Berkeley has remained in general use, and if there were no competing name it could be accepted and dated from a later time. However, *Hemicardion cumingianum* Fée (1852) was validly described and has priority over any description of the species under the epithet *presliana*. This was recognized inferentially by Holttum[21] in a comment under *Cyclopeltis crenata* (Fée) C. Chr. to the effect that it [*C. crenata*] "differs from both these species in its strongly toothed scales, and from *C. presliana* (which should more properly be called *C. cumingiana* Fée) in the lower pinnae not being gradually and evenly reduced to a small size." However, this is an error, for there is no "*C. cumingiana* Fée," i.e., "*Cyclopeltis cumingiana* Fée" but only *Hemicardion cumingianum* Fée. This is an inadvertent new combination, but it cannot be considered validly published, since there is no citation of the basionym, which is required for valid publication of a new combination after January 1, 1953. Therefore, the above new combination is required.

35. HYMENOPHYLLUM DELICATISSIMUM Fée, Crypt. Vasc. Brés. 2:86, *t. 105, f. 1.* 1872–73 = **H. elegans** Spreng. *in* L. Syst. Veg. ed. 16, 4:133. 1827.
TYPE: Serra dos Orgãos, Brazil, *Glaziou* 3591 (holotype P, Morton photograph 4595).

In my revision, through typographical errors, the page of publication was erroneously given as 83 instead of 86, and the type number as 3491 instead of 3591.

36. HYMENOPHYLLUM ELEGANTISSIMUM Fée, Mém. Foug. 11:118, *t. 29, f. 2.* 1866 = **H. lineare** (Swartz) Swartz, Journ. Bot. Schrad. 1800 (2):100. 1801.
TYPE: Guadeloupe, *L'Herminier* (probable holotype P, 2 sheets, Morton photographs 4572, 4573).

In my revision of the American species of the section *Sphaerocionium*[22] I placed this species as a synonym of *H. hirsutum* (L.) Swartz (*H. ciliatum* Swartz) going by the original description and figure only. However, the two sheets at Paris that are labeled *H. elegantissimum* and which agree well enough with the description and illustration of Fée are clearly *H. lineare* (Swartz) Swartz, or at least the Guadeloupe form of this species, which is unusually large and delicate. The only sheet at Stockholm that could be the type of *Trichomanes lineare* Swartz does not bear the name in Swartz' hand, but it presumably is the holotype, from Jamaica, collected by Swartz (Morton photograph 6191). A duplicate agreeing with this specimen is in the Willdenow

[21] Ferns of Malaya 527. 1954.
[22] Contr. U.S. Nat. Herb. 29:139–201. 1947.

Herbarium (no. 20221) at Berlin, a fragment sent to Willdenow by Swartz (photograph by Tryon, US).

37. Hymenophyllum fragile var. **venustum** (Desv.) Morton, Contr. U.S. Nat. Herb. 29:173. 1947.

In making this new combination for a rather common south Brazilian variant of the widespread *H. fragile* (Hedwig) Morton, I indicated that the basionym *Hymenophyllum venustum* Desv. (Mém. Soc. Linn. Paris 6:332. 1827) was a new name for *H. hirsutum* sensu Raddi, not Swartz, and thus that the type was from Mandiocca, Brazil, *Raddi*. It is true that Desvaux in describing his new species *H. venustum* cited "*Hymenophyll. hirsutum* Raddi, Syn. fil. bras., p. 19. Excl. syn." but it is extremely unlikely that he saw any specimen collected by Raddi. On the other hand, a specimen in the Desvaux Herbarium at Paris labeled *H. venustum* in Desvaux's hand is undoubtedly the actual specimen used in drawing up the description. This is the holotype (Morton photograph 4587).

38. Hymenophyllum producens Fée, Crypt. Vasc. Brés. 1:196, *t. 71, f. 4.* 1869.
TYPE: Serra dos Orgãos, Brazil, *Glaziou* 3349 (holotype P, Morton photograph 4625).

In my revision [23] I placed this species as a doubtful synonym of *H. valvatum* Hook. & Grev., following Christensen, but with a good deal of doubt, correctly as it now appears. The type shows that this species does not belong in the section *Sphaerocionium* but is a species of the section *Mecodium*, and is one of the allies of *H. polyanthos* (Swartz) Swartz. Its proper disposition must await a study of the Brazilian species of this difficult group.

39. Hymenophyllum silveirae Christ, *in* Schwacke, Pl. Nov. Minciras 2:14. 1900.
SYNTYPE: Itacolumi, Brazil, *Schwacke* 12528 (P, Morton photograph 4619).

In my revision of *Hymenophyllum* section *Sphaerocionium* I recognized this species as distinct, going on Christ's description of the fronds as caespitose, although I expressed some doubt as to the correctness of this character, which is hardly to be expected in the genus *Hymenophyllum*. This syntype shows that the fronds are definitely not caespitose but are scattered on a filiform rhizome as in related species. The fronds are very small and probably depauperate. I judge that they represent depauperate plants of *H. pulchellum* Schlecht. & Cham. The only character that might be distinctive is that the plants of *H. silveirae* are said to be terrestrial, whereas those of *H. pulchellum*

[23] Contr. U.S. Nat. Herb. 29:161. 1947.

are epiphytic, so far as known. But if this character is important or uniformly true remains to be determined.

40. LONCHITIS JAVANICA Desr. *in* Lam. Encycl. Méth. 3:594. 1789=**Blotiella javanica** (Desr.) Morton, comb. nov.
Lonchitis pubescens Willd. ex Kaulf. Enum. Fil. 195. 1824.

The type of *L. javanica*, as the name indicates, was supposed to have been collected in Java by Commerson. In the Index Filicum, Christensen placed it as doubtfully being the same as the later *L. pubescens*, a species of Madagascar, Réunion, Mauritius, and the Seychelles Islands, the doubt occasioned by the locality. No species of *Lonchitis* has been known from Java and is not to be expected there. There is no specimen in Paris of *L. javanica* from Java, but there is a specimen in the Jussieu Herbarium, Cat. no. 1286 A, labeled *L. javanica*, in an old hand. The smaller specimen mounted on the sheet agrees in its dimensions and characters with the original description by Desrousseaux and is doubtless the holotype. It is, as might be expected, not from Java but from "Ile de Bourbon," i.e., Réunion, collected by Commerson. It is a small specimen of the species later described as *L. pubescens* Willd., as suspected by Christensen.

The type of *Lonchitis* L. has often been considered to be *L. aurita* L., as for instance by Christensen, but Tryon [24] has shown that this is not a suitable species, because the application of the name is uncertain. Linnaeus did not have a specimen of *L. aurita* but based the species on Plumier Tract. Fil. *t. 17*, an illustration that does not correspond with any plant known from Martinique, where Plumier obtained his material. The illustration shows a plant with the venation and general appearance of *Pteris* subgenus *Litobrochia*, but no species from Martinique has such broad and blunt segments. Still, it may be conjectured that Plumier did have a species of *Pteris* in hand, for *Lonchitis* as generally delimited does not grow in Martinique. I cannot believe that Tryon is right in thinking that *t. 17* represents *L. hirsuta* L. in part. This plant was also known to Plumier, who illustrated it very well, for him, in *t. 20*. The illustration and description of the veins as reticulate removes *L. hirsuta* from consideration, as well as the illustration and description of the stipe as bearing "soft, black spines," which are presumably scales with indurated bases. Such scales have been attributed to some *Pteris* species of the Lesser Antilles, such as *P. aculeata* Swartz, but *L. hirsuta* does not have any scales, only hairs. Tryon thinks that the description of *L. aurita* was based on a mixture of *L. hirsuta* and some unidentified species of *Pteris*, but I do not see any decisive evidence of this. For

[24] Contr. Gray Herb. 191:93–100. 1962.

this reason I think that *Lonchitis aurita* L. must be listed among the dubious species of *Pteris*. The genus usually called *Lonchitis* must therefore be called *Blotiella* Tryon (type: *Lonchitis glabra* Bory), and the small genus *Anisosorus* Trev. becomes a synonym of *Lonchitis* L. (type *L. hirsuta* L.).

41. MENISCIUM AFFINE Presl ex Ettingsh. Denkschr. Akad. Wiss. Math. Naturw. (Wien) 23:94, *t. 13, f. 3.* 1864; Farnkr. Jetztw. 170, *fig. 73, t. 135, f. 16.* 1865 = **Thelypteris affinis** (Presl) Morton, comb. nov.
Dryopteris dispar Maxon & Morton, Bull. Torr. Bot. Club 65:364. 1938. Based on *Meniscium affine* Presl, non *Dryopteris affinis* Newm. (1854).
TYPE: Brazil, collector unknown (not seen).

I have recently [25] considered *Meniscium* a section of *Thelypteris*, which necessitates a number of new combinations, which are proposed in this paper. Several of the most common species have already been transferred to *Thelypteris*, i.e., *T. serrata* (Cav.) Alston (1932), *T. angustifolia* (Willd.) Proctor (1953), *T. reticulata* (L.) Proctor (1953), and *T. salzmannii* (Fée) Morton (1960). Under *Dryopteris* several of the old specific epithets were preoccupied and not available, but these may now be used under *Thelypteris*.

42. MENISCIUM ANDREANUM Sodiro, Recens. 71. 1883; Crypt. Vasc. Quit. 392. 1893 = **Thelypteris andreana** (Sodiro) Morton, comb. nov.
Dryopteris andreana C. Chr. Ind. Fil. 252. 1905.
TYPE: Río Toachí, near Santo Domingo, Ecuador, *Sodiro* (not seen).

43. MENISCIUM ARBORESCENS Humb. & Bonpl. ex Willd. Sp. Pl. 5:133. 1810 = **Thelypteris arborescens** (Humb. & Bonpl.) Morton, comb. nov.
Phegopteris arborescens Mett. Fil. Lechl. 2:24. 1859.
Phegopteris mollis Mett. Ann. Sci. Nat. V, Bot. 2:242. 1864. Type: Llano de San Martin, Paraiso, Colombia, alt. 300 m., *Triana* (isotype US).
Nephrodium sorbifolium var. *molle* Hieron. Bot. Jahrb. Engler 34:449. 1904.
Nephrodium sorbifolium f. *angustipinnatum* Hieron. Bot. Jahrb. Engler 34:449. 1904. Type: Alto de las Cruces, near Cali, Colombia, alt. 1100 m., *Lehmann* 2927 (isotype US).
Dryopteris sorbifolia var. *mollis* Hieron. Hedwigia 46:351. 1907.
Dryopteris reticulata var. *arborescens* Brause, Verh. Bot. Ver. Brandenb. 51:2. 1910.
Dryopteris permollis Maxon & Morton, Bull. Torr. Bot. Club. 65:372. 1938. Based on *Phegopteris mollis* Mett., non *Dryopteris mollis* (Jacq.) Hieron. (1907).
Thelypteris mollis Tryon, Rhodora 69:7. 1967.

When Dr. Maxon and I prepared our revision of *Dryopteris* subgenus *Meniscium* in 1938 we had not seen the type of *Meniscium arborescens* Humb. & Bonpl. We placed it with a query as a synonym of *D. hostmannii* (Klotzsch) Maxon & Morton and were not greatly concerned

[25] Amer. Fern Journ. 53:154. 1963 [1964].

regarding its identity, since the specific epithet could not be taken up under *Dryopteris*, because there already existed a different *D. arborescens* (Baker) Kuntze, an entirely unrelated species from Samoa. However, under the generic name *Thelypteris* the epithet *arborescens* is not preoccupied. I have recently seen a photograph by Dr. Tryon of the holotype of *M. arborescens* from the Willdenow Herbarium in Berlin (sheet no. 19576); the type came from the region of the Mission of Santa Cruz, Venezuela.[26] The photograph matches closely a collection from Vegas del Río de El Cantaño, State of Aragua, Venezuela, April 25, 1937, made by H. Pittier (no. 14003), which is the species that Maxon and I called *Dryopteris permollis*, rather than *D. hostmannii*. One of the chief features rendering *Meniscium arborescens* a questionable species was the description by Humboldt and Bonpland of the plants being arborescent and having a trunk 6-feet high, which is unlike any known *Meniscium*. This must have been an error, very likely a confused memory. The type specimen is a detached frond, without a rhizome, but doubtless the rhizome is subterranean and short-creeping like other specimens of *D. permollis* and other Menisciums.

44. MENISCIUM CHRYSODIOIDES Fée, Gen. Fil. 225. 1852=**Thelypteris chrysodioides** (Fée) Morton, comb. nov.
Dryopteris chrysodioides Maxon & Morton, Bull. Torr. Bot. Club 65:373. 1938.
TYPE: "Habitat in America australi., Collect. Pamplin., in Herb. cl. Moug., no. 55" (not seen; possibly at Oxford University).

The following variety may also be transferred: *Dryopteris chrysodioides* var. *goyazensis* Maxon & Morton, Bull. Torr. Bot. Club 65:374. 1938=**Thelypteris chrysodioides** var. **goyazensis** (Maxon & Morton) Morton, comb. nov. Type: Rio Corumba, Goyaz, Brazil, *Glaziou* 22631 (holotype NY).

45. MENISCIUM FALCATUM Liebm. Dansk. Vid. Selsk. Skrift. V, 1:183. 1849=**Thelypteris falcata** (Liebm.) Tryon, Rhodora 69:6. 1967.
Meniscium jurgensenii Fée, Gen. Fil. 223. 1852 (as "Jungersenii"). Type: Mexico, *Jurgensen* 917 (not seen).
Dryopteris falcata C. Chr. Dansk. Vid. Selsk. Skrift. VII. Naturv. Afd. 10(2):270. 1913, non Kuntze (1891).
Dryopteris jurgensenii Maxon & Morton, Bull. Torr. Bot. Club 65:360. 1938.
TYPE: Lacoba, Chinantla, Puebla, Mexico, *Liebmann* 2756 (holotype C!, isotypes K, US).

46. MENISCIUM GIGANTEUM Mett. Fil. Lechl. 1:19. 1856=**Thelypteris gigantea** (Mett.) Morton, comb. nov.

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[26] See Sandwith on the Venezuelan localities of Humboldt & Bonpland, Kew Bull. Misc. Inf. 1925:301. 1925.

Dryopteris gigantea C. Chr. Ind. Fil. 267. 1905, non Kuntze (1891).
Dryopteris simplicifrons C. Chr. Ind. Fil. 486. 1906. Based on *Meniscium giganteum* Mett.
TYPE: San Gavan, Peru, *Lechler* 2292 (isotype K).

47. MENISCIUM LONGIFOLIUM Desv. Mém. Soc. Linn. Paris 6:223. 1827 = **Thelypteris longifolia** (Desv.) Tryon, Rhodora 69:7. 1967.
Dryopteris desvauxii Maxon & Morton, Bull. Torr. Bot. Club 65:369. 1938. Based on *Meniscium longifolium* Desv., non *Dryopteris longifolia* (Fée) Hieron.
TYPE: Brazil, without further locality or collector (P, photograph of holotype US).

It is not necessary to repeat here the intricate nomenclatural situation of this species when it is referred to the genus *Dryopteris*. When it is placed in *Thelypteris*, there is no problem, for the earliest specific epithet *longifolia* can be adopted without question.

The following form may also be transferred: *Dryopteris desvauxii* f. *glandulosa* Maxon & Morton, Bull. Torr. Bot. Club 65:372. 1938. Type: Morro das Pedras, São Paulo, Brazil, *Brade* 5753 (holotype NY) = **Thelypteris longifolia** (Desv.) Tryon f. **glandulosa** (Maxon & Morton) Morton, comb. nov.

48. MERTENSIA SQUAMULOSA Desv., Journ. de Bot. Appliqué 1:268. 1813 = **Gleichenia squamulosa** (Desv.) Moore, Ind. Fil. 383. 1862.

This species has generally been considered dubious, even by Poiret, who probably had material available for study. The original description, although not so very brief, does not mention the really distinctive characters, and the locality is stated only generally as South America. It is as follows: "Stipite ramisque angulato squamoso; frondibus pinnatis pinnis lanceolato-acutis, pinnulis linearibus oblongis, extimis confluentibus. Habitat in America australi."

The holotype, in the Muséum National d'Histoire Naturelle, Paris, in the Desvaux Herbarium is a good specimen. It was studied by Weatherby, who reported [27] that it was apparently the same as *G. pedalis* (Kaulf.) Sprengel,[28] a well-known Chilean species. Weatherby quoted the locality as "America australi (Termae Chili)," but this was a misreading of the label, which really reads "America australi (in Peruvia Chilen.)." Although the Desvaux epithet has priority, Weatherby hesitated to displace the name *G. pedalis* without further study. I can now verify Weatherby's determination, and so there seems now no reason not to adopt the prior name *G. squamulosa* (Desvaux) Moore. The holotype has been photographed (Morton 4534).

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[27] Contr. Gray Herb. 114:27. 1936.

[28] In L. Syst. Veg. ed. 16, 4:26. 1827, based on *Mertensia pedalis* Kaulf. Enum. Fil. 39. 1824.

The confusion as to the locality undoubtedly goes back to the original collector. There is another sheet in Paris (Morton photograph 4535) which is identical with the holotype, and which bears the label Chile, *Dombey*. Another collection at Paris (Herb. Bory, Morton photograph 4492) is also the same, and this one gives the locality as Peru (no collector stated). This is not the only instance in which Dombey's localities are confused between Peru and Chile. This collection marked as from "Peru" is identical with Chilean specimens of *G. pedalis* and unlike any Peruvian species.

49. NEOTTOPTERIS STIPITATA J. Smith, Cat. Cult. Ferns 49. 1857=**Asplenium stipitatum** (J. Smith) J. Smith, Ferns Brit. & For. 210. 1866.
Asplenium squamulatum Blume var. *smithii* Hook. Sp. Fil. 3:83. 1860. Based on *Neottopteris stipitata* J. Smith (1857).
Asplenium robinsonii F. von Muell. Journ. Bot. Brit. & For. 22:289. 1884. Type: Norfolk Island, *Robinson* in 1884 (holotype BM, Morton photograph 7202, isotype K, Morton photograph 8010).
TYPE: Cultivated in the Royal Botanic Gardens, Kew (holotype from the J. Smith Herbarium, BM, Morton photograph 7203).

The original *Neottopteris stipitata* J. Smith *in* Hook. Journ. Bot. 3:409. 1841, was a nomen nudum, based on *Cuming* 195 from Camarines Sur [Luzon, Philippine Islands]. A plant at the Royal Botanic Gardens, Kew, was cultivated under this name for a long time, and was supposed to have been grown from spores from the Cuming collection. However, the Cuming collection is *Asplenium squamulatum* Blume whereas the cultivated plant is different. Although much less extreme in its irregularity it appears to agree with the type of *Asplenium robinsonii* F. von Muell., and it was therefore very likely introduced into Kew from Norfolk Island, and not from the Philippine Islands.

50. NEPHRODIUM KUNTHII Desvaux, Mém. Soc. Linn. Paris 6:258. 1827=**Thelypteris kunthii** (Desv.) Morton, comb. nov.
Dryopteris normalis C. Chr. Ark. för Bot. 9[11]:31. 1910.
Thelypteris normalis Moxley, Bull. So. Calif. Acad. Sci. 19:57. 1920.
TYPE: Cumanacoa, Venezuela, *Humboldt & Bonpland* (lectotype P).

The complete original description of Desvaux was:
"59. N[ephrodium]. kunthii N. Aspid[ium]. patens Kunth, in Humb. et Bonpl., Nov. gen. 1, p. 13. Excl. syn."
This is not a good way to publish a new species, but it is a possible and valid way, by reference to a description under another name previously, effectively, and validly published. There is a description in H.B.K., Nov. Gen. et Sp. 1:13. 1815, and this work is certainly effectively and validly published. Therefore the description of *Nephrodium kunthii* is the one given in H.B.K. and the type is the

specimen or specimens on which that was based, namely Humboldt and Bonpland specimens collected "prope Cumanacoa, Guanaguana et Caripe" [Venezuela]. The synonyms to be excluded were *Aspidium patens* Swartz and *Polypodium patens* Swartz. Desvaux properly transferred the latter to *Nephrodium* as *N. patens* (Swartz) Desv. (Mém. Soc. Linn. Paris 6:258. 1827).

A specimen in the Desvaux Herbarium at Paris (Morton photograph 4424) has the name *N. kunthii* Desv. and the synonym *Aspidium patens* Kunth in the hand of Desvaux. The locality is given as "Habitat ad Caracas." It is a single pinna, which was very likely removed by Desvaux from a Humboldt and Bonpland collection. The locality "Caracas" to older authors often signified the whole of modern Venezuela. However, this fragment cannot be considered the type of the species, for the description of Kunth was not based on it. In the Humboldt Herbarium at Paris there is a specimen collected by Humboldt and Bonpland labeled *Aspidium patens* and which was collected at Cumanacoa, Caripe. This is undoubtedly the plant or one of the plants on which the description of *Aspidium patens* was drawn by Kunth, and thus surely a syntype. I designate this specimen as lectotype of *Nephrodium kunthii* Desv. This is a fairly good specimen; I did not photograph it but I studied it and made a note about it. Another specimen in the general herbarium at Paris from Caripe, Herb. Bonpland, and labeled *Aspidium patens* (Morton photograph 4425) is another syntype. These three specimens, the fragment in the Desvaux Herbarium, the one in the Humboldt Herbarium, and the one in the general herbarium are all the same. Desvaux was right; they are not *Aspidium patens* Swartz [*Thelypteris patens* (Swartz) Small] but the nearly related species recognized and described by Christensen as *Dryopteris normalis*, which is common in the southern United States and the West Indies and which occurs also scattered on the Continent from Mexico south probably to Bolivia and Brazil. It is unfortunate that the well-known name *normalis* should disappear, but there is no help for it. For another synonym, see under *Aspidium germanii* Fée (p. 36).

51. PHEGOPTERIS CANESCENS Mett. Abh. Senck. Naturf. Ges. 2:314. 1858=

Ctenitis canescens (Mett.) Morton, comb. nov.

Polypodium canescens Kunze ex Mett. Abh. Senck. Naturf. Ges. 2:314. 1858, pro syn.; Hook. Sp. Fil. 4:262. 1862 (non Blume, 1828).

Polypodium blanchetianum Kunze ex Mett. Abh. Senck. Naturf. Ges. 2:314. 1858, pro syn.

Dryopteris blanchetiana Hieron. Hedwigia 46:344. 1907.

Ctenitis blanchetiana Copel. Gen. Fil. 124. 1947. Illegit.

The type and only specimen originally cited by Mettenius was *Moricand* 2454, from Bahia, Brazil, which actually should be *Blanchet*

2454 (Herb. Moricand). The original *Phegopteris canescens* Mett. is entirely legitimate but it could not be transferred to *Dryopteris*, because of the existence of the prior and different *Dryopteris canescens* (Blume) C. Chr. However, there is no obstacle to the use of the epithet *canescens* under the genus *Ctenitis*. In transferring the epithet *blanchetiana* in preference, Copeland was routinely transferring names as he usually did without checking the synonymy or the availability of prior epithets.

52. PHEGOPTERIS MEMBRANACEA Mett. Fil. Lechl. 2:22. 1859=**Thelypteris membranacea** (Mett.) Tryon, Rhodora 69:7. 1967.
Nephrodium lechleri Hieron. Bot. Jahrb. Engler 34:448. 1904. Syntypes: Azangaro, Peru, *Lechler* 1785 and San Gavan, Peru, *Lechler* 2321. The former is here chosen as lectotype. Hieronymus based his new species on the same two specimens that were the original syntypes of *Phegopteris membranacea* Mett., and thus his species is identical with *P. membranacea* and the epithet *lechleri* superfluous. As pointed out by Maxon & Morton in 1938, Hieronymus misapplied the name *membranacea* to an entirely different plant that formed no part of the original concept of the species.
Dryopteris membranacea C. Chr. Ind. Fil. Suppl. 1:35. 1913.
LECTOTYPE: Azangaro, Peru, *Lechler* 1785 (K) (chosen by Maxon & Morton, Bull. Torr. Bot. Club 65:366. 1938).

53. PHEGOPTERIS NICARAGUENSIS Fournier, Bull. Soc. Bot. France 19:252. 1872=**Thelypteris nicaraguensis** (Fournier) Morton, comb. nov.
Dryopteris nicaraguensis C. Chr. Ind. Fil. 279. 1905.

The type came from Chontales, Nicaragua, *Levy* 460 *bis*. A fragment is in the Christensen Herbarium at the British Museum (Morton photograph 6374). This is one of the commonest species of the section *Goniopteris* in Central America.

54. POLYPODIUM ADIANTOIDES Aublet, Hist. Pl. Guiane 2:962. 1775=**Polybotrya caudata** Kunze.

This species has remained unknown. The excessively brief original description consisted only of "pinnis auriculatis." The type specimen is in the British Museum (Morton photograph 6626). It is *Polybotrya caudata* Kunze. Fortunately, the specific epithet of Aublet, which is not really especially appropriate, cannot be taken up, since Aublet's species is a later homonym of the different *Polypodium adianthoides* Burm. (1768), which appears to be also a dubious species at the present time. Very likely Burmann's type is in Geneva.

55. POLYPODIUM COMPTONIIFOLIUM Desv. Mag. Naturf. Freund. Berlin 5:316. 1811 [as "*comptoniaefolium*"]=**Grammitis trifurcata** (L.) Copel. Gen. Fil. 211. 1947 (*Polypodium trifurcatum* L.).
Polypodium comptonioides Desv. Mém. Soc. Linn. Paris 6:231. 1827. An illegitimate change of name for *P. comptoniifolium*.
TYPE: Bourbon [Réunion], *Commerson* (holotype P, Jussieu Herb. Cat. 1095, Morton photograph 2947).

Although Desvaux cited the locality of his *P. comptoniifolium* as Bourbon, and the label gives the same data, this must be an error, for no species remotely like this has been found since in Bourbon, the present-day Réunion Island, but the type is quite typical of the West Indian *Grammitis trifurcata*. Madame Tardieu must have come to the same conclusion, for she does not mention *P. comptoniifolium* in her treatment of the species of *Grammitis* in Réunion and the other islands of the Madagascarian region.[29]

56. POLYPODIUM CONJUGATUM Poir. *in* Lam. Encycl. Méth. 5:516. 1804=**Polypodium phyllitidis** L. (forma).

TYPE: "Cette plante est originaire des Indes. (V. s. in Herb. Jussieu)." The specimen mentioned in the Jussieu Herbarium (Cat. 1071) (Morton photograph 2934) is indicated as from "Amerique meridionale donné par M. Houston." The original ticket with the name *Polypodium conjugatum* is in the hand of Poiret, and the specimen agrees with the description.

It has apparently been assumed that this is an Old World species, and although it was based on a single specimen it was inexplicably referred by Christensen in the Index Filicum to both *Polypodium phymatodes* and *Drynaria quercifolia*. But as the label indicates, this is actually an American plant received from William Houstoun, very likely one of his own collections from Mexico, Cuba, or Jamaica. The specimen is a teratological (forked and variously lobed) specimen of the common tropical American species *Polypodium phyllitidis* L.

57. POLYPODIUM CORDIFOLIUM Mart. & Gal. Mem. Acad. Brux. 15:31, *t. 4, f. 2.* 1842, non L., 1753=**Tectaria heracleifolia** (Willd.) Underw. Bull. Torr. Bot. Club 33:200. 1906.

TYPE: Antigua, Veracruz, Mexico, June–October 1840, *Galeotti* 6313 (BR, holotype, Morton photograph 5175).

In the Index Filicum, this species is referred to *Aspidium trifoliatum* L., i.e., *Tectaria trifoliata* (L.) Cav. The type shows that it is a juvenile specimen of *T. heracleifolia* with simple unlobed blades. Although juvenile, it is fertile, a fact that doubtless persuaded Martens and Galeotti to consider it different. However, such juveniles are not at all uncommon in this species. *Polypodium cordifolium* L. is an entirely different thing, i.e., *Nephrolepis cordifolia* (L.) Presl.

58. POLYPODIUM EXPANSUM Poir. *in* Lam. Encycl. Méth. 5:523. 1804=**Tectaria incisa** Cav.

TYPE: Based on a specimen from America in the Lamarck Herbarium, Paris. This was referred by Christensen in the Index Filicum to *Aspidium martinicense* Spreng., with a query. I have seen the type, which is marked "No. 127. *Polypodium*, unique. *Polypodium expansum* Dict." (Morton photograph 2664).

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[29] "Les 'Grammitis' de la région Malgache," Notul. Syst. [Paris] 15:421–425. 1959.

The type is the upper part of a frond of typical (glabrous) *Tectaria incisa* Cav., of which *Aspidium martinicense* is a synonym (Cf. C. Christensen, Dansk Bot. Ark. 9(3):14. 1937). There is another specimen in the Lamarck Herbarium (Morton photograph 2665) which is also labeled "*Polypodium expansum* Dict." It was collected (or received) from Sonnerat. There is some error here, because this is an utterly different plant, which does not agree at all with the description of *Polypodium expansum* Poir. Although I have not studied it closely, it is, I believe, *Dryopteris varia* (L.) Kuntze, and must have come from Asia.

59. POLYPODIUM FLABELLIFORME Poir. *in* Lam. Encycl. Méth. 5:519. 1804=**Grammitis flabelliformis** (Poir.) Morton, comb. nov.
Polypodium rigescens Bory ex Willd. *in* L. Sp. Pl. ed. 4, 5:183. 1810.
TYPE: Bourbon (Réunion), *Bory* (presumably in Herb. Willd., B).

This was originally published with the diagnosis "Polypodium fronde angustissima, elongata, pendula; lobis alternis, obtusis. (N)" and the citation of the illustrations "Polypodium aliud pendulum, minimum. Plum. Fil. pag. 68, tab. 87," and "Polypodium lonchitidis folio, angustissima, pendulum. Petiv. Fil. tab. 10, fig. 1." A variety is described: "A. Idem, fronde breviori, lobis longioribus.N" The citation regarding the type is: "Cette plante croît dans la Martinique, sur le tronc des vieux arbres, d'où ses feuilles pendent vers la terre. (V. s. in herb. Juss. & Desfont.)." Thus, it is seen that the species was based on literature references to Plumier and Petiver and on dried specimens in the Jussieu and Desfontaines Herbaria. In such cases there is no doubt that the actual specimens studied should be regarded as the types rather than the figures cited, which were based on material not seen by Poiret.[30]

In the Jussieu Herbarium at Paris there is only one specimen that could be the type. It is labeled "Polyp. flabelliforme Poir. Dict." in the hand of Poiret; it also bears the references to the illustrations of Plumier and Petiver (Morton photograph 2951). This is surely the specimen mentioned in the original description from the Jussieu Herbarium. This sheet is from the island of Bourbon (Réunion) in the Indian Ocean, from the Herbarium of Commerson (which usually means actually collected by Commerson). It is surely the species subsequently described as *Polypodium rigescens* Bory. Very likely the locality "Martinique" in the original description came only from Plumier. Poiret was in error in identifying this Commerson collection with the Plumier plate, for the two are evidently different.

[30] The Plumier illustration quoted is the left-hand plant on the plate, the identity of which is uncertain, but it is one of the small species of the "*Xiphopteris*" group *P. hartii*, *P. knowltoniorum*, *P. serricula*, or *P. taenifolium*, perhaps the latter.

The name *Polypodium flabelliforme* Poir. was erroneously applied in the Index Filicum to a small, delicate species of the Lesser Antilles, especially Guadeloupe, the proper name of which is still uncertain. Mr. George Proctor gave me a manuscript for criticism some time ago (about 1960) in which he attempted to show that the name *Polypodium suspensum* L. applied to this species. The basis of *P. suspensum* is the larger, right-hand plant of Plumier's plate 87. I could not agree and wrote to Mr. Proctor (Jan. 30, 1961) as follows:

> . . . I agree that *suspensum* cannot be a synonym of *asplenifolium* or a near ally. As you say, it must be searched for among the essentially glabrous species. However, it does not seem to me that it really can be *flabelliforme*, and I don't think that the Grenada specimen labelled *tovarense*, of which you have a photograph, can be "*flabelliforme*" either; the segments are of a different shape, acute rather than rounded and fan-shaped (*flabelliforme*). I won't presume to identify the Grenada specimen from the photograph. But it does seem to me that pl. 87 of Plumier, the type of *suspensum*, can be *jubiforme*. You eliminate this from consideration by saying that it has "narrower, nearly exstipitate, downwardly attenuate fronds and relatively narrow, oblong segments," but I can't quite agree. Sometimes the segments are narrow and oblong in *jubiforme*, but this is a variable species and some specimens have the segments relatively broad at base. The illustration does show the blade somewhat reduced at base and with only short stipes. Plumier's illustrations are notoriously inaccurate, and I think that this is as good as might be expected for *jubiforme*. In any case, "*flabelliforme*" is also downwardly reduced and nearly exstipitate. Plumier's description and also his illustration says that the segments have the shape of the front of a shoe or a foot, i.e., a high instep curving down to a narrow toe, in other words the segments are broad at base, acute at apex and curved on the proximal side. This is not at all true of "*flabelliforme*" but is more or less true of *jubiforme*—not all specimens and not all segments, but some. You disregard the disposition of the sori near the apex of the segments, although this is particularly mentioned in the Plumier description and is shown in the illustration. This is characteristic of *jubiforme* and not of "*flabelliforme.*" Finally, *jubiforme* is common in Martinique; all collectors have found it, and it would be odd if Plumier had not. The only illustration of Plumier that could be it is this pl. 87. To sum up, it appears to me that there is good reason to believe that *suspensum* is the same as *jubiforme* and the earliest name. The alternative would be to regard *suspensum* as a "sp. dub." and allow it to remain unused for anything.

The following year Mr. Proctor wrote[31] on the identification of *Polypodium suspensum* L., claiming the identification with *P. jubiforme* as his own, and stating that his previous manuscript identifying the species with *P. flabelliforme* had been written with "private misgivings," although certainly none were expressed to me at the time. He further misquotes me as saying "that if the identity of the Linnaean *P. suspensum* could not be clearly settled, it might be better to treat it as a 'nomen ambiguum' than to displace a well-established name," but as indicated above in the quotation from my letter I said nothing of the sort. On the contrary I said that there is good reason to believe

[31] Brit. Fern Gazette 9:77. 1962.

that *suspensum* is the same as *jubiforme* and the earliest name for that species. Mr. Proctor also stated in his note that the type of *P. flabelliforme* represented a different species from Mauritius, without indicating me as the source of his information. I did write to him concerning the type of this species, identifying it with *P. rigescens* Bory, but I certainly did not say that it came from Mauritius; I told him that it came from Bourbon (Réunion), as it does.

60. POLYPODIUM HOSTMANNII Klotzsch, Linnaea 20:397. 1847=**Thelypteris hostmannii** (Klotzsch) Morton, comb. nov.
Dryopteris hostmannii Maxon & Morton, Bull. Torr. Bot. Club 65:369, *t. 14*. 1938.
TYPE: Surinam, *Hostmann & Kappler* 828 (holotype B!, isotypes K, NY).

This is one of the species of *Meniscium*, which I now treat as a section of *Thelypteris*.

61. POLYPODIUM INVISUM Swartz, Prodr. Veg. Ind. Occ. 133. 1788, non Forster, 1786=**Thelypteris invisa** (Swartz) Proctor.
Aspidium invisum Swartz, Journ. Bot. Schrad. 1800²:34. 1801. Considered to be a legitimate new name dating from 1801, and not a transfer of *Polypodium invisum* Swartz. Based on the same type.
Nephrodium invisum (Swartz) Desv. Mém. Soc. Linn. Paris 6:257. 1827. Based on *Aspidium invisum* Swartz.
Lastrea invisa (Swartz) Presl, Tent. Pterid. 75. 1836. Based on *Aspidium invisum* Swartz.
Nephrodium sloanei Baker, *in* Hook. & Bak. Syn. Fil., ed. 2.263. 1874. Based on *Polypodium invisum* Swartz, non Forster, but illegitimate, since the combination *N. invisum* (Swartz) Desv. was prior and correct. Also illegitimate, since a later homonym of *N. sloanei* Presl, 1825.
Dryopteris sloanei Kuntze, Rev. Gen. Plant. 2:813. 1891. A legitimate name, considered not as a transfer of the illegitimate *N. sloanei* Baker, non Presl, but a new name, based on the same type, necessitated by the unavailability of the epithet *invisa* under *Dryopteris* because of the different species *Dryopteris invisa* (Forster) Kuntze.
Dryopteris oligophylla Maxon, Contr. U.S. Nat. Herb. 10:489. 1908. Based on *Polypodium invisum* Swartz, non Forster. Illegitimate, since superfluous, the name *Dryopteris sloanei* Kuntze being nomenclaturally synonymous, legitimate, and available.
Thelypteris oligophylla (Maxon) Proctor, Bull. Inst. Jam. Sci. Ser., 5:62. 1953. Based on *Dryopteris oligophylla* Maxon. Illegitimate, since the earliest available specific epithet was not adopted. All the epithets *Aspidium invisum* Swartz, *Lastrea abrupta* Presl, and *Dryopteris sloanei* Kuntze were available and prior to *Dryopteris oligophylla*.
Thelypteris invisa (Swartz) Proctor, Rhodora 61:306. 1959. To be considered as based on *Aspidium invisum* Swartz.
TYPE: Jamaica, *Swartz*.

In 1786, Forster described one of his collections from Tahiti as *Polypodium invisum* Forster, and two years later Swartz, doubtless unaware of Forster's publication, described one of his own collections

from Jamaica as *Polypodium invisum* Swartz. Strangely enough, by a coincidence these two species from widely separated regions are rather similar, both habitally and taxonomically, belonging to *Dryopteris* subgenus *Cyclosorus* of Christensen. Exactly why both Forster and Swartz considered these innocuous ferns "*invisum*," i.e., hateful or detested, is debatable. Still, later pteridologists who have found it necessary to classify the numerous, close, and impossibly variable species of this group, such as *D. patens*, *D. normalis*, *D. feei*, *D. augescens*, *D. unita*, *D. arida*, *D. ferox*, and so on can perhaps make a guess.

Forster's species, being prior, has properly continued to retain the epithet *invisum*, being usually known as *Dryopteris invisa* (Forster) Kuntze. I have examined the type in the British Museum (Natural History) and found that it agrees with such Tahiti specimens as *Setchell & Parks* 9 and 16, and Wilkes Expedition 7 in the U.S. National Herbarium. Only the lowest pair of veins is truly united in the leaf tissue, the second pair connivent to the sinus. Indusia are present and are long-pilose. The sporangia bear one or occasionally two hairs on the lateral faces. The upper surface is glabrous except along the midrib, but the lower is pilosulous on the costules and veins. The pinnae are only slightly cut, about one-third the way to the midrib or less. By these characters this species may be distinguished from *unita* and allied species. It is found also in the Fiji Islands (Wilkes Expedition) and elsewhere in Polynesia and Melanesia, but its exact range remains to be determined.

According to my present generic concepts in this group, *Polypodium invisum* Forster belongs in *Thelypteris*, subgenus *Cyclosorus*.[32] Unfortunately, it cannot now be transferred to *Thelypteris*, because of the recent publication of the combination *Thelypteris invisa* (Swartz) Proctor for the West Indian species, an unwise action on the part of Mr. Proctor, for now the well-known Old World *invisa* must be renamed, and the name *invisa* transferred to a West Indian and tropical American species, which can only result in confusion. However, there is no help for it.

Thelypteris forsteri Morton, nom. nov.

Polypodium invisum Forster, Fl. Ins. Austr. Prodr. 81. 1786. Type: Tahiti, *Forster* (BM). Not *Thelypteris invisa* (Swartz) Proctor, 1959.

Nephrodium invisum (Forster) Carruthers *in* Seem. Fl. Vit. 362. 1873, non Desv., 1827.

Dryopteris invisa (Forster) Kuntze, Rev. Gen. Plant. 2:813. 1891.

Aspidium invisum (Forster) Christ, Bot. Jahrb. Engler 23:350. 1896, non Swartz, 1801.

Cyclosorus invisus (Forster) Copel. Gen. Fil. 142. 1947.

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[32] Amer. Fern. Journ. 53:153. 1963 [1964].

The American species described originally by Swartz has had an unhappy nomenclatural history. In recent times commonly known as *Dryopteris oligophylla* Maxon, it is allied to *D. normalis*, *D. augescens*, *D. serra*, *D. patens*, and others; it is the giant of the group, well-grown mature plants often being two meters high, with pinnae 30 cm. long or more and 3 cm. wide. The lowest veins are connivent to the sinus but not actually united, for which reason Copeland placed the species in "*Lastrea*," where it is wholly out of place. In its sum total of characters (aspect, texture, basally abrupt leaf-blades, persistent hairy indusia, and so forth), it is closely allied to *D. dentata* and related species, and thus belongs in subgenus *Cyclosorus*.

This West Indian plant can be known as *Thelypteris invisa*, but not with the authority proposed by Proctor, who gave the basionym as *Nephrodium invisum* Desv. (1827). However, the first validation of the epithet *invisum*, by Art. 72 (Note) of the International Code of Botanical Nomenclature, was as *Aspidium invisum* Swartz (1801). Inasmuch as Desvaux cited Swartz' name as the basis for his *Nephrodium invisum*, Proctor's new combination can be considered as valid, with the parenthetical authority changed from Desvaux to Swartz.

The var. *invisa*, with the sori strictly medial, is restricted to the Greater Antilles. The closely related forms of the Continent, ranging from Mexico to Ecuador are referable to:

Thelypteris invisa var. **aequatorialis** (C. Chr.) Morton, comb. nov.
Dryopteris oligophylla Maxon var. *aequatorialis* C. Chr. Dansk. Vid. Selsk. Skrift. [Monogr. Dryopteris] VII, 10(2):189. 1913.

SYNTYPES: Andes, Ecuador, *Sodiro* (C); Santa Jues, Río Pastaza, Ecuador, *Stuebel* 871 (B); Niebli, *Lehmann* 5053 (B); Baños, Río Pastaza, Ecuador, *Spruce* 5296 (Bonaparte Herb., P); Peru, *Schenke* in 1909 (Rosenst. Herb., S); Bolivia, *Bang* 2312 (B, US). As lectotype I choose *Spruce* 5296 (P).

Although similar of course to typical *T. invisa*, this seems to be rather distinct. The distinguishing character of *T. invisa* var. *invisa* is that the basal two or three segments of the lower pinnae are abortive, as well illustrated by Christensen (1913, f. 25). Variety *aequatorialis* has the basal segments smaller, but not aborted; in addition, it is sometimes a smaller plant, with fewer pairs of veins in the segments (10–12 pairs, as contrasted with 15 pairs or more in var. *invisa*), and it is much hairier; the veins, costules, and indusia are densely pilose, and some hairs are borne on the costules and veins of the upper surface, which are glabrous in var. *invisa*. In size and some other respects, var. *aequatorialis* resembles *T. kunthii*, which is lighter green in color, softer in texture, with fewer pairs of veins (5–9 pairs), and which has the bases of the lower pinnae somewhat enlarged rather than contracted.

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Thelypteris invisa var. **pallescens** (C. Chr.) Morton, comb. nov.
Dryopteris oligophylla var. *pallescens* C. Chr. Dansk. Vid. Selsk. Skrift VII, 10(2):188. 1913. A large number (19) of syntypes are cited. I do not have all these at hand. I choose *Eggers* 15037 from El Recreo, Ecuador, as lectotype (U.S. 831342, annotated by Christensen)

The nomenclature has been complicated by a taxonomic problem caused by the fact that a closely allied plant was described from Peru as *Aspidium abruptum* Kunze, i.e., *Dryopteris kunzeana* (Hooker) C. Chr. Christensen stated that this certainly was not specifically distinct from *D. oligophylla*, and named it *D. oligophylla* var. *kunzeana* (Hooker) C. Chr. I have looked into the matter and I must say that I agree. Still, this South American plant can be recognized as varietally distinct. It has the sori slightly but perceptibly supramedial.

Thelypteris invisa var. **kunzeana** (Hook.) Morton, comb. nov.
Aspidium abruptum Kunze, Linnaea 9:93. 1834, non Blume, 1828. Type: Pampayacu, Peru, *Poeppig* in 1829.
Lastrea abrupta Presl, Tent. Pterid. 75. 1836. By Art. 72 (Note) to be considered not as a transfer but as a new name, dating from 1836, for *Aspidium abruptum* Kunze, non Blume.
Nephrodium kunzeanum Hooker, Spec. Fil. 4: 102. 1862. Based on *Aspidium abruptum* Kunze, non Blume, but illegitimate, since Hooker should have adopted the epithet *abrupta* Presl, which was available under *Nephrodium*.
Nephrodium abruptum (Presl) Baker, Syn. Fil. 263. 1868. To be considered as based on *Lastrea abrupta* Presl.
Dryopteris abrupta (Presl) Kuntze, Rev. Gen. Plant. 2:812. 1891. To be considered based on *Lastrea abrupta* Presl, and not a transfer of *Aspidium abruptum* Kunze. A correct name under the genus *Dryopteris*.
Dryopteris kunzeana (Hooker) C. Chr. Ind. Fil. 273. 1905. Illegitimate.
Dryopteris oligophylla Maxon var. *kunzeana* (Hook.) C. Chr. Dansk. Vid. Selsk. Skrift. VII, 10(2):189. 1913.

I have not seen the type, collected by Poeppig, but the following collections agree with the original description and with Christensen's characterization:

Peru: Río Marañon, below Rancho Indiana, Distr. Iquitos, Dept. of Loreto, Jan. 28, 1932, *Mexia* 6462. Lower Río Nanay, Dept. Loreto, May–June 1929, *Ll. Williams* 379. Muña, May 23–June 4, 1923, *Macbride* 3991. La Merced, Dept. Junín, May 29–June 4, 1929, *Killip & Smith* 23542.

Christensen cites also *Spruce* 4066, from Tarapoto, and *Schenke* 47, as well as a collection from Río Balao, Ecuador (*Eggers* 14523).

The South Brazilian *Dryopteris oligophylla* var. *lutescens* C. Chr.[33] seems to me to be doubtfully distinguishable from var. *kunzeana*. It was based on five specimens: Minas Gerais, *Mosen* 2144, 2145; São

[33] Dansk. Vid. Selsk. Skrift VII, 10(2):188. 1913.

Paulo, *Regnell* III, 1448, *Widgren;* and Rio Grande do Sul, *Juergens & Stier* (Rosenst. Exs. 182). I do not designate a lectotype.

62. POLYPODIUM NIGRIPES Hasskarl, Catalogus Plantarum in Horto Botanico Bogoriensi Cultarum Alter 4. 1844=**Tectaria melanocaulis** (Blume) Copeland.

In Christensen's Index Filicum, *Polypodium nigripes* Hassakarl is unplaced and considered a dubious species. In the Rijksherbarium, Leiden, there is a sheet labeled *P. nigripes*, with the number 1718 H.B., the "H.B." standing for Hortus Bogoriensis, which I take to be a Hasskarl collection (Morton photograph 2324). Very likely the holotype is in the herbarium of the Hortus Bogoriensis, but this is presumably an isotype. It is a *Tectaria*, and bears an identification as *Tectaria melanocaulis* (Blume) Copeland by Rosenstock, apparently a correct determination. Another sheet in Leiden, also labeled *P. nigripes*, is also from the Hortus Bogoriensis, and bears the name "Pakoe tjaga"; it is a juvenile leaf, representing the same species *Tectaria melanocaulis* (Morton photograph 2327). Another specimen in Leiden is *Zollinger* 1626 (Morton photograph 2325), from "vom Wasserfall Tjikapundung bei Bandong in der Erde," collected March 17, 1844. Since this is not from the garden at Bogor it cannot be a type, but may very well have been studied by Hasskarl and thus also be authentic; it represents the same species *T. melanocaulis.*

63. POLYPODIUM LEUCATOMOS Poir. *in* Lam. Encycl. Méth. 5:516. 1804=**Polypodium aureum** L. var.

TYPE: Cayenne [French Guiana], *LeBlond* (holotype, Lamarck Herbarium P, Morton photograph 2684).

There has been some doubt about this species, despite the fact that the type is readily available in the herbarium in Paris. In the Index Filicum, Christensen referred it to *Polypodium aureum* L. var., correctly as it turns out. The type is a large frond, lacking stipe and rhizome; the venation is regularly phlebodioid and the sori in two ranks on each side of the costae. In his "Plantae Stuebelianae" in 1909, Hieronymus [34] took up the name *P. leucatomos* Poiret [misspelled "*leucotomos*"] as the correct name for the species long known as *P. decumanum* Willd., without explanation. There is no indication that he saw Poiret's type, and it is unlikely that he did so. *Polypodium decumanum* is allied with *P. aureum*, but has the sori in four to seven rows on each side of the costae. Christensen [35] in the first supplement to the Index Filicum followed Hieronymus in taking up the name *P. leucatomos* in place of *P. decumanum*, erroneously as it now appears.

[34] Hedwigia 48:267. 1909.

[35] Ind. Fil. Suppl. 1:125. 1913.

It has appeared on herbarium labels and occasionally in publications, e.g., by Kramer, Meded. Bot. Mus. Utrecht 124:489. 1954.

64. POLYPODIUM OBTUSILOBUM Desv. Ges. Naturf. Freund. Mag. Berlin 5:317. 1811=**Ctenitis desvauxii** Tardieu-Blot.

Aspidium desvauxii Mett. ex Kuhn, Fil. Afr. 231. 1868. Renaming of *Polypodium obtusilobum* Desv. under *Aspidium*, the epithet *obtusilobum* not being available because of the prior and different *Aspidium obtusilobum* Fée (1857).

Dryopteris obtusiloba (Desv.) C. Chr. Ind. Fil. 280. 1905.

Ctenitis desvauxii Tardieu-Blot, Notul. Syst. 15:82. 1954. Proposed as a new species, with a Latin diagnosis. There is no mention of *Polypodium obtusilobum* Desv. or *Aspidium desvauxii* Mett., nor any mention of the Desvaux type. No type was indicated. Four specimens, all from Mauritius, were cited, of which the first may stand as lectotype: "Bois de l'anse Courtois de la montagne du Corps de Garde, *Boivin*, août, 1849." The identification "*Polypodium thelypteroides* Desv.?" appears on the label, evidently the reason for the choice of the specific epithet "*desvauxii*."

Ctenitis desvauxii (Mett. ex Kuhn) Tardieu-Blot, Notul. Syst. 16:181. 1960. Based on *Aspidium desvauxii* Kuhn and *Polypodium obtusilobum* Desv. Not validly published, because the basionym, although stated, is not fully cited with the place of publication (Code, Art. 33), and also illegitimate, since a later homonym of *C. desvauxii* Tardieu-Blot (1954).

The type was said by Desvaux to be from Madagascar, but this was an error. The holotype is in the Jussieu Herbarium (P), Cat. no. 1115 (Morton photograph 2959), and it definitely says "Ile de France" i.e., Mauritius, Herb. Commerson. This species is apparently known only from Mauritius and not from Madagascar. The epithet *obtusilobum*, although entirely validly published and the oldest, cannot be transferred to the genus *Ctenitis* because of the different species *Ctenitis obtusiloba* (Baker) Ching (Bull. Fan Mem. Inst. Biol. Bot. 8:296. 1938), based on a type from Ceylon.

65. POLYPODIUM PELLITUM Willd. ex Kaulf. Enum. Fil. 89. 1824=**Polypodium lycopodioides** L. Sp. Pl. 1082. 1753.

In the Index Filicum (1906) *P. pellitum* is left as a dubious species, and apparently no one has examined the type and published on its identity since that time. I have studied the type in the Willdenow Herbarium, Berlin; it is sheet no. 19604, collected in Brazil, by Commerson. It represents *P. lycopodioides* L. The blades lack scales, as they should in this species.

66. POLYPODIUM PENNATUM Poir. *in* Lam. Encycl. Méth. 5:535. 1804=**Thelypteris pennata** (Poir.) Morton, comb. nov.

Polypodium megalodus Schkuhr, Kr. Gew. 1:24, *t. 19b*. 1806.

Dryopteris megalodus Urban, Symb. Antill. 4:21. 1903.

Thelypteris megalodus Proctor, Bull. Inst. Jamaica, Sci. Ser. 5:61. 1953.

TYPE: "Amer. Merid.," without collector (holotype P, Morton photograph 4704).

Christensen, in his Monograph of the Genus *Dryopteris*, suggested that *Polypodium pennatum* Poir. was the earliest name for the species that he called *D. megalodus* (Schkuhr) Urban, but he hesitated to take up the name without studying the type. I have seen the type in Paris and it is definitely the same as *megalodus*, which is a distinctive species. There is an isotype in the Persoon Herbarium, Rijksherbarium, Leiden, with the label probably in the hand of Poiret (Morton, photograph 1195). The type locality, other than "Amer. merid.," is unknown, but it is very likely West Indian.

67. POLYPODIUM SERRATUM Aublet, Hist. Pl. Guian. 2:962. 1775=**Bolbitis guianensis** (Aubl.) Kramer, Acta Bot. Neerl. 3:486. 1954.
Asplenium auritum Swartz var. *acutum* Mett. f. *serratum* (Aubl.) Mett. Abh. Senckenb. Naturf. Gesell. Frankfurt 3:147. 1858.
TYPE: French Guiana, *Aublet* (holotype BM, Morton photograph 7464).

Polypodium serratum Aublet (non alior.) has always been a dubious plant. Aublet's original description is too brief:

> . . . fronde simplici; pinnis alternis, serratis.
> Lonchitis minor, pinnis latioribus, leviter denticulatis, superiori latere auriculatis. Sloan. *Hist. Jam. vol. 1. pag. 78. Cat. p. 16. tab. 33. fig. 1.*

The description "simplici" is an error, because simple fronds do not have pinnae, and Aublet describes the pinnae. Aublet tried to identify his specimens, and new species, with previously published descriptions and illustrations by Plumier, Sloane, and others, often incorrectly since his specimens came from French Guiana, and the illustrations cited usually were of West Indian species, mostly from Jamaica or Hispaniola. In this case, the reference to Sloane's illustration of a Jamaica plant is such an error, which has caused a continuing confusion. Sloane's drawing (very poor) is of some species of *Asplenium*, and Mettenius went so far as to identify it with a form of *Asplenium auritum* Swartz, and Posthumus, in his Ferns of Surinam, listed *Polypodium serratum* as a synonym of *Asplenium sulcatum* Lam. Christensen, in his Index Filicum, was much closer when he indicated that *P. serratum* was "*Asplenium* sp. vel *Leptochilus guianensis.*" An examination of the holotype in the British Museum shows that it is indeed *Leptochilus guianensis* (Aubl.) C. Chr., which must now be known as *Bolbitis guianensis* (Aubl.) Kramer, incidentally a name omitted from the new Index Filicum, Supplement IV.

68. POLYPODIUM TRISTE Kunze, Linnaea 9:47. 1834=**Thelypteris tristis** (Kunze) Tryon, Rhodora 69:8. 1967.
Dryopteris tristis Kuntze, Rev. Gen. Pl. 2:814. 1891.

TYPE: Mission Tocache, Huallaga, Peru, *Poeppig* 1959. The original was doubtless destroyed in Leipzig. I did not find any isotypes in the British Museum, or in the herbaria in Paris and Leiden.

This species was not known from Venezuela when Christensen published his monograph of *Dryopteris* in 1913. Knuth listed it in his Initia Florae Venezuelensis, but without noting any specimens; like many of Knuth's records in this work, the inclusion was very likely based on probabilities. A definite Venezuelan record is as follows:

VENEZUELA: Forest 3–4 km. southeast of "Los Patos," north of Río Hacha and north of Río Supamo, 30 km. south of El Manteco, State of Bolívar, alt. 365 m., Aug. 9, 1960, *Steyermark* 98027 (VEN).

69. POLYPODIUM VARIOLATUM Willd. *in* L. Sp. Pl. ed. 4, 5:192. 1810=**Polypodium triseriale** Swartz, Journ. Bot. Schrad. 1800 (2):26. 1801, var.

TYPE: Brazil, communicated by Hoffmannsegg (perhaps collected by Sieber ?) (holotype Willd. Herb., B. sheets 19685 [1–3], photograph of one sheet by Tryon, US).

Mettenius, in his monograph of *Aspidium*,[36] placed "*Polypodium variolatum* Willd. Herb. Spreng." as a synonym of *Aspidium macrophyllum* Swartz, i.e., the present *Tectaria incisa* Cav., and Christensen in the Index Filicum followed him and placed *P. variolatum* Willd. as an undoubted synonym of *Aspidium martinicense* Spreng., another name for the same species of *Tectaria*. Mettenius would hardly have made a mistake of this sort, and so it may be presumed that the specimen labeled *P. variolatum* in the Sprengel Herbarium (present location unknown) really is a *Tectaria*. However, the holotype, which I saw in the Willdenow Herbarium in Berlin, is by no means a *Tectaria*, but a typical *Polypodium* of the section *Goniophlebium*. It has been identified by Hieronymus, probably correctly, as *P. menisciifolium* Langsd. & Fisch., but so far as I can tell at present this species is only a variety or form of the common and widespread *P. triseriale* Swartz (much better known under the later name *P. brasiliense* Poir.). This group of species needs to be critically revised.

70. POLYSTICHUM CYPHOCHLAMYS Fée, Gen. Fil. 279. 1852=**P. echinatum** (Gmelin) C. Chr.

TYPE: Cuba, *Linden* 2175 (holotype P, Morton photograph 4300).

In 1909, Maxon [37] listed *P. cyphochlamys* Fée as a doubtful synonym of *P. triangulum* (L.) Fée, without having seen the type. At that

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[36] Abh. Senckenb. Ges. Frankfurt 2:406. 1858.

[37] Contr. U.S. Nat. Herb. 13:28. 1909.

time he was misidentifying *Polypodium triangulum* L. with a common and widely distributed species of the Greater Antilles with spiny, holly-like pinnae. Later, Maxon [38] looked into the question further and came up with a different answer. Since there is no specimen in the Linnaean Herbarium of *Polypodium triangulum*, the illustration cited by Linnaeus must be taken as the type; this illustration by Petiver was not original but was redrawn from Plumier *t. 72*, which thus becomes the type of *P. triangulum*. The Plumier description and drawing, although the latter is stylized, best represent a species of Hispaniola collected several times by Ekman, Leonard, and Picarda, quite different from the species previously called *Polystichum triangulum*, which now becomes *P. echinatum* (Gmelin) C. Chr. The holotype of *P. cyphochlamys* Fée shows that this species is a synonym of typical *P. echinatum*.

71. POLYSTICHUM KILLIPII Maxon, Contr. U.S. Nat. Herb. 24:53, *t. 20*. 1922=
Polystichum trapezoides (Swartz) Presl, Tent. Pterid. 83. 1836.
Aspidium trapezoides Swartz, Journ. Bot. Schrad. 1800(2):31. 1801.
Type: Jamaica, *Swartz* (Isotype B, Willd. Herb. 19749, photograph by Tryon US).

TYPE: One mile below Ipswich, Parish of St. Elizabeth, Jamaica, Apr. 1, 1920, *Maxon & Killip* 1520 (Holotype US).

In his treatment of the West Indian species of *Polystichum* in 1909, Maxon [39] mentioned a collection from Troy, Jamaica (*Underwood* 2837) as possibly representing an undescribed species; this he later described in 1922 as *P. killipii*. In 1909 he considered *Aspidium trapezoides* Swartz as a doubtful synonym of his *P. "triangulum,"* i.e., the present *P. echinatum*, and in describing *P. killipii* he apparently did not again consider the identification of *A. trapezoides*. A study of a photograph of an isotype of *A. trapezoides* shows that Maxon was probably right in considering it (in herbarium) as the same as his *P. killipii*, but a detailed study of the holotype in Stockholm is necessary for a definite decision.

A plant from Cuba (El Yunque, Baracoa, Oriente, *Ekman* 3918, US) is rather poor, but apparently represents *P. trapezoides*, which thus occurs in Cuba as well as Jamaica.

The Cuban species of *Polystichum*, not so numerous as in Hispaniola or Jamaica, may be distinguished by the following key:

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[38] The identification of *Polypodium triangulum* L. Journ. Washington Acad. Sci. 18:582–586. 1928.

[39] Contr. U.S. Nat. Herb. 13:29. 1909.

Key to the Cuban Species of *Polystichum*

Blades pinnate below the middle only, the apex long-attenuate, radicant. **71a. P. rhizophyllum**

Blades fully pinnate or twice-pinnate.
Blades once-pinnate only.
Apex of blades attenuate or flagelliform, proliferous.
Pinnae auriculate at both upper and lower bases.
Pinnae holly-like, with several marginal spines . . **71b. P. ilicifolium**
Pinnae with only the auricles and apex spinescent.
Pinnae coriaceous, with obscure veins, strongly hastate, the auricles and apex strongly spinose . . . . . **71c. P. machaerophyllum**
Pinnae herbaceous, with evident veins, broadly subhastate but not spinescent . . . . . **71d. P. deminuens**
Pinnae not auriculate at the lower base . . . . . **71e. P. decoratum**
Apex of blades not proliferous.
Stipes and rhachises densely and persistently paleaceous. **71f. P. triangulum**
Stipes and rhachises with few scales, these mostly basal.
Blades short, ovate to broadly ovate, long-stipitate . **71g. P. wrightii**
Blades elongate, lanceolate to linear-lanceolate, relatively shorter stipitate.
Superior auricle spinescent, never free . . . . . **71h. P. echinatum**
Superior auricle merely mucronate, not spinescent, often nearly free in mature plants . . . . . **71i. P. trapezoides**
Blades partly or fully twice-pinnate, proliferous.
Apex of blade acute, the proliferous bud borne on the rhachis below the apex . . . . . **71j. P. polystichiforme**
Apex of blade truncate, the bud terminal . . . . . **71k. P. viviparum**

71a. Polystichum rhizophyllum (Swartz) Presl, Tent. Pterid. 82. 1836.

Polypodium rhizophyllum Swartz, Veg. Ind. Occ. Prodr. 132. 1788. Type: Jamaica, *Swartz* (Isotype B, Herb. Willd. 19739, photograph by Tryon, US). Illustrated by Hook. & Grev., Icon. Fil. 1:*t. 59*. 1829.

Polystichum krugii Maxon, Proc. Biol. Soc. Washington 18:215. 1905. Type: Cayey, Puerto Rico, *Sintenis* 2240 (holotype US). The reduction to *P. rhizophyllum* was made by Maxon himself (Contr. U.S. Nat. Herb. 13:36. 1909).

Although common in Puerto Rico, this species is rare in Jamaica and Cuba, and has apparently not been reported from Hispaniola, but it is known from that island by one collection: Morne de La Selle, *Holdridge* 1879 (US).

71b. Polystichum ilicifolium Fée, Gen. Fil. 279. 1852.

Polystichum aquifolium Underw. & Maxon, Bull. Torr. Bot. Club 29:584. 1902 (nom. abort.). A renaming of *P. ilicifolium* Fée from the mistaken idea that this name was invalidated by *P. ilicifolium* (Don) Moore, but the latter combination was not published until 1858, and it is thus the illegitimate later homonym and not *P. ilicifolium* Fée (1852).

TYPE: Santiago, Cuba, *Linden* 2193 (holotype P, Morton photograph 4301). The type is a single frond, without rhizome, quite typical of the species as usually interpreted. The species was illustrated by Fée, Mém. Foug. 6:*t. 6, f. 4.* 1853.

71c. Polystichum machaerophyllum Slosson, Bull. Torr. Bot. Club 40:688, *t. 26.* 1914.

TYPE: Arroyo del Medio, Sierra de Nipe, Oriente, Cuba, *Shafer* 3262 (isotype US).

71d. Polystichum deminuens Maxon, Contr. U.S. Nat. Herb. 24:53, *t. 19.* 1922.

TYPE: Near Josephina, Oriente, Cuba, Nov. 4, 1859, *Wright* 1057 (holotype YU, fragment US).

Known only from the type.

71e. Polystichum decoratum Maxon, Contr. U.S. Nat. Herb. 13:30, *t. 3.* 1909.

TYPE: Farallones de La Perla, near Monte Verde, Oriente, Cuba, *Maxon* 4408 (holotype, US).

Endemic in the Province of Oriente, Cuba, where it is not rare.

71f. Polystichum triangulum (L.) Fée, Gen. Fil. 279. 1852.

Polypodium triangulum L. Sp. Pl. 2:1088. 1753. Type: Based on *Trichomanes folio triangulo dentato.* Pet. fil. 76. *t. 1, f. 10,* an illustration which is a copy of Plumier, Tract. Fil. Amer. *t. 72.* 1705. As mentioned above under *P. cyphochlamys,* Maxon identified the Plumier description and figure with a rather rare species of Hispaniola. From the description, he is probably right, although it would be hard to be sure from the figure alone. An illustration of *P. triangulum* in this accepted sense of Maxon is given by Maxon, Journ. Washington Acad. Sci. 18:583, *f. 1.* 1928.

Although this species is known only from Hispaniola and not from Cuba, it is included here because the epithet *triangulum* has been widely applied to Cuban plants erroneously.

71g. Polystichum wrightii (Baker) C. Chr. ex Maxon, Contr. U.S. Nat. Herb. 16:50. 1912.

Polypodium wrightii Baker *in* Hook. & Bak. Syn. Fil. 304. 1867. Type: Cuba, *Wright* 3924 (holotype presumably K).

Dryopteris sauvallei C. Chr. Ind. Fil. 291. 1905. Based on *Polypodium wrightii* Baker.

Polystichum longipes Maxon, Contr. U.S. Nat. Herb. 13:34, *t. 6.* 1909. Type: Cuba, *Wright* 3924 (holotype US). Although this species is based on the same collection number as *Polypodium wrightii,* and Maxon at the time was ignorant of the existence of *P. wrightii,* his species cannot be considered as nomenclaturally synonymous, since it is based on a different sheet of this collection. Wright's fern collections are notoriously mixed, and it is theoretically possible that Maxon's species is different from Baker's, although in this instance that does not appear to be the case.

An extremely rare endemic, probably still known only from the original collections by Wright. Maxon cites duplicates at GH, NY, YU, and the Sauvalle Herbarium, Havana.

71h. Polystichum echinatum (Gmelin) C. Chr. Ind. Fil. 581. 1906.

Polypodium echinatum Gmelin *in* L. Syst. Nat. ed. 13, 2(2):1309. 1791. Type: Sloane, Voy. Jam. Nat. Hist. 2:*t. 36, f. 4, 5.* 1707. Although Gmelin probably saw only the illustrations cited, the specimens on which the illustrations were based are preserved in the Sloane Herbarium at the British Museum (Natural History), and were seen by Maxon (Journ. Washington Acad. Sci. 18:584. 1928). These can be designated as lectotypes. Although they represent somewhat different forms, Maxon considered them conspecific and that they represented the common species of the Greater Antilles that long passed as *P. triangulum.* Swartz cited these same two figures in his description of his *Aspidium mucronatum,* but his species was based not on these figures but on Jamaican specimens that he had collected and which are preserved in the herbarium at Stockholm; these represent a different species, *Polystichum mucronatum* (Swartz) Presl, which is endemic in Jamaica. A synonym of *P. mucronatum* is *Polystichum struthionis* Maxon, Contr. U.S. Nat. Herb. 13:37, *t. 8, fig. A, B.* 1909, which was based on "*Aspidium mucronatum* Hook. Sp. Fil. 4:9, *t. 216.* 1862, not Sw. 1801" in the mistaken belief that Swartz had based his species on the Sloane illustrations rather than specimens. Maxon's *P. struthionis* should be considered a superfluous name. Even so, it should be typified, something that Maxon did not do. The only specimen seen by Hooker and also cited by Maxon is Jamaica, *Wilson* (K), and this is herewith designated as lectotype of *P. struthionis* Maxon.

Polystichum falcatum Fée, Gen. Fil. 279. 1852. Type: Port-au-Prince, Haiti, *L'Epagnier* (not seen). Referred here on the authority of Maxon.

Polystichum cyphochlamys Fée, Gen. Fil. 279. 1852. See above for a discussion of the type.

71i. Polystichum trapezoides (Swartz) Presl, Tent. Pterid. 83. 1836. See above for a discussion of the type and synonymy.

71j. Polystichum polystichiforme (Fée) Maxon, Contr. U.S. Nat. Herb. 13:35. 1909.

Phegopteris polystichiformis Fée, Gen. Fil. 247. 1852. Type: Monte Líbano, Oriente, Cuba, *Linden* 1874 (isotype BM, Morton photograph 6415).

This is a rare species of Cuba and Jamaica. Maxon did not see a type, but he correctly identified the species with *Wright* 832 from Monte Verde, Oriente, Cuba.

71k. Polystichum viviparum Fée, Gen. Fil. 280. 1852. Type: Oriente, Cuba, *Linden* 1742 p.p.

Polystichum heterolepis Fée, Gen. Fil. 279. 1852. Type: Oriente, Cuba, *Linden* 1742 p.p. (isotype BR, photograph by Weatherby, US).

As noted by Maxon,[40] *P. viviparum* Fée and *P. heterolepis* Fée were founded on portions of the same collection, and the differences noted

[40] Contr. U.S. Nat. Herb. 13:33, *t. 5.* 1909.

by Fée are such as ordinarily obtain between different plants from a single collection. In uniting the two species, Maxon chose the name *P. heterolepis*, without explanation, but doubtless going on "page priority." However, this has nothing to do with the choice between names of the same date. In the Index Filicum, Christensen (p. 588, 1906) chose the name *P. viviparum*, and reduced *P. heterolepis* to synonymy under it (p. 582), and he must be followed.

72. PTERIS CONFLUENS Thunb. Prodr. Pl. Cap. 171. 1800=**Thelypteris confluens** (Thunb.) Morton, comb. nov.
Aspidium thelypteris (L.) Swartz var. *squamigerum* Schlecht. Adumbr. 23, *t. 11.* 1825. Type from Cape Province, South Africa.
Nephrodium squamulosum Hook. fil. Fl. N. Zeal. 2:39. 1855.
Aspidium squamigerum Fée, Mém. Foug. 8:104. 1857.
Thelypteris squamulosa Ching, Bull. Fan Mem. Inst. Biol. Bot. 6:5, 329. 1936.
Thelypteris palustris var. *squamigera* Tardieu, Mém. I.F.A.N. 28:119, *t. 20, f. 7–9.* 1953.
TYPE: Cape of Good Hope, South Africa, *Thunberg* (UPS, seen by Schelpe).

Dr. E. A. C. L. E. Schelpe pointed out recently [41] that *Pteris confluens* Thunb. (1800) is not a synonym of *Pellaea auriculata* (Thunb. Fée, as it is listed in the Index Filicum, but is really the same as the South African *Thelypteris palustris* Salisb. var. *squamigera* (Schlecht.) Tardieu. He saw the type of Thunberg's species in the herbarium at Uppsala. He overlooked the fact that the epithet *confluens* antedates *palustris* by many years. *Polypodium palustre* Salisb., dating from 1796,[42] is twice illegitimate, first because it is a later homonym of *P. palustre* Burm. (1768) and second because it was a superfluous name, being an unnecessary change of specific epithet on transferring *Acrostichum thelypteris* L. (1753) to *Polypodium*. The epithet *palustris* validly dates from *Thelypteris palustris* Schott (1834).[43]

This is a most distressing circumstance. If the South African plant, which occurs also in southern India and China, and also in New Zealand, is considered only varietally different from *T. palustris* Schott, it means that the latter will become a variety of *T. confluens*. This plant is one of the best known ferns of western Europe and the United States, where it is commonly called "Marsh Fern." Until recently it has usually been called *Dryopteris thelypteris* (L.) A. Gray. It is possible that this northern plant really is specifically distinct from the South

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[41] "The identity of some fern types in the Thunberg Herbarium," Journ. So. Afr. Bot. 29:91. 1963. See also "A review of the southern African species of Thelypteris," Journ. So. Afr. Bot. 31:260. 1965.
[42] Prodr. 403. 1796.
[43] Gen. Fil. ad *t. 10.* 1834.

African, and I prefer to consider it so for the present rather than displace the well-known name *T. palustris*. The chief difference seems to be in the presence of small scales along the costae of the pinnae beneath in the South African *T. confluens*. If the European and North American plant is considered eventually only varietally different, it will be a difficult problem to ascertain the oldest varietal name applicable to any form of this plant.

73. PTERIS DOLABRIFORMIS Poir. *in* Lam. Encycl. Méth. 5:722. 1804 = **Adiantum villosum** L. Syst. Nat. ed. 10, 2:1328. 1759.

TYPE: Santo Domingo, collector unknown (holotype P, ex Herb. Poiret, Morton photograph 2645, left-hand plant; the right-hand plant mounted on the sheet from the Morne de la Soufrière, Guadeloupe, October 1827, is not a type, but it also represents *A. villosum* L.).

In the Index Filicum *P. dolabriformis* Poir. is placed as a doubtful synonym of *Adiantum pulverulentum* L., but the type, although fragmentary, obviously represents *A. villosum* L. in the usual sense.

74. Pteris macroptera Link, Hort. Reg. Bot. Berol. Descr. 2:32. 1833.

A specimen (Morton photograph 5446) distributed under this name from the Hortus Berolinensis is undoubtedly authentic material, for it quite agrees with the original description. The species was described from material cultivated in the botanical garden in Berlin from material originally received from Brazil. The species is a synonym of the common and widely distributed *Pteris altissima* Poiret, which is filed in most herbaria as *P. kunzeana* Agardh, a later name taken up in the Index Filicum. The venation of this species is characteristic: Along the midribs of the pinnae on both sides are three areoles between adjacent midribs of the segments, two elongate and one short. Allied species such as *P. polita* (*P. propinqua*) and *P. decurrens* normally have just one elongate areole between adjacent costules. The segments are more or less equal at the upper and lower base.

Another species, apparently confined to Brazil, has passed as *P. macroptera*, but it is obviously different. It has distant segments which are very strongly decurrent at the lower base and not surcurrent at the upper. Because of the distance between adjacent midribs of the segments there are several (more than three) areoles along the midrib of the pinna between adjacent segment-midribs. This large species has two available names, the one by Fée being the older.

Pteris angustata (Fée) Morton, comb. nov.[44]

Litobrochia angustata Fée, Crypt. Vasc. Brés. 1:49, *t. 11, f. 1.* 1869. Syntypes from Rio de Janeiro, Brazil, *Glaziou* 2149 and 2310 (not seen; presumably in Paris).

[44] *Pteris angustata* Wallich, List. no. 93. 1828, is a nomen nudum.

Pteris paulistana Rosenst. Hedwigia 46:89. 1906. Type: Rio Grande, São Paulo, *Wacket* 32 (Rosenst. Fil. Austrobras. 344) (isotype US).
RANGE: Rio de Janeiro, São Paulo, Minas Gerais, and Paraná, Brazil.

Other collections in the National Herbarium are:

BRAZIL: RIO DE JANEIRO: Tijuca, *Smith & Brade* 2208; Rio de Janeiro, *Martius* (HBG, Morton photograph 2201). SÃO PAULO: Iguape, *Brade* 8244. MINAS GERAIS: Areponga to Fazenda de Grama, *Mexia* 4244 (distr. as *P. decurrens*). PARANÁ: Serra do Mar, *Dusén* 543a. Without specific locality: *Bowie & Cunningham* 4; *Glaziou* 7952.

75. PTERIS POLYPODIOIDES Poir. *in* Lam. Encycl. Méth. 5:716. 1804=**Thelypteris totta** (Thunb.) Schelpe, Journ. So. Afr. Bot. 29:91. 1963, var. **hirsuta** (Mett.) Morton, comb. nov.
Aspidium unitum var. *hirsutum* Mett. Ann. Lugd. Bat. 1:230. 1864.
Dryopteris gongylodes var. *hirsuta* C. Chr. Dansk. Vid. Selsk. Skrift. VII, 10(2):193. 1913.
Cyclosorus goggilodus var. *hirsutus* Farwell, Amer. Midl. Nat. 12:259. 1931.
TYPE: Brazil, without collector (Lamarck Herb., P, Morton photograph 2755).

In the Index Filicum, *Pteris polypodioides* Poir. is placed as a synonym of *Dryopteris unita* (L.) Kuntze. Probably no recent pteriodologist has critically examined the type, which turns out to be the hirsute variety of the common and widespread species usually known as *Dryopteris gongylodes* (Schkuhr) Kuntze (the "*D. goggilodus*" of some recent authors who believe in blindly following the original spelling, even though that is patently impossible orthographically). When I discovered this, I was intending to abandon reluctantly the well-known epithet *gongylodes* and to propose a new combination based on *Pteris polypodioides* Poir., which has priority, but Dr. Schelpe has recently shown that there is still another earlier name for the species—*Polypodium tottum* Thunb. (1800). He is right in proposing the new combination *Thelypteris totta* (Thunb.) Schelpe to replace *T. gongylodes* (Schkuhr) Small, but it is most unfortunate, because the epithet "*totta*" has been widely used for an entirely different and also widespread species that is correctly known now as *Thelypteris pozoi* (Lagasca) Morton (correct, that is, according to my opinion of the taxonomy; some authors would prefer to call it *Leptogramma pozoi* or *Stegnogramma pozoi*).

Thelypteris totta occurs in two forms, one with the blades essentially glabrous beneath and aften capitate-glandular (the original *Aspidium gongylodes* Schkuhr, the type from British Guiana, usually called *Dryopteris gongylodes* var. *glabra* (Mett.) C. Chr), and one with the pinnae conspicuously pilosulous beneath on the midribs and veins, the blades eglandular, and the indusia hairy (characters shown by the type of *Pteris polypodioides*); the latter is usually called *Dryopteris*

gongylodes var. *hirsuta* (Mett.) C. Chr. These two forms are best considered as varieties provisionally, for although they look very different in extreme specimens, they do seem to be connected by intermediates that are only slightly pubescent; this would be a good problem for cytological and genetical study. Dr. Schelpe did not mention any pubescence on the type of *Polypodium tottum* Thunb., and so it may be assumed that it is essentially glabrous, especially since the hirsute variety apparently does not occur in the region of the Cape of Good Hope, where Thunberg's type came from. The name "var. *glabra*" will disappear, and the typical form should be known merely as var. *totta*. This species has been described many times, and I have assembled over two typewritten pages of synonymy. The more important synonyms (mostly on the authority of the Index Filicum) of var. *totta* are:

Aspidium pohlianum Presl, Delic. Prag. 1:173. 1822. Type from Madeiras, Brazil, Pohl (not seen).

Nephrodium venulosum Desv. Mém. Soc. Linn. Paris 5:255. 1827. Type from "insulis africanis" (not seen).

Hypopeltis propinquoides Bory, *in* Bélanger, Voy. Bot. 2:69. 1833. Type from Java (not seen).

Aspidium ecklonii Kunze, Linnaea 10:546. 1836. Type from South Africa (not seen).

Some of the synonyms of var. *hirsuta* are presumed to be:

Nephrodium propinquum R. Brown, Prodr. Fl. Nov. Holl. 148. 1810. Type from Australia, *Banks & Solander*, in 1770 (holotype BM, Morton photograph 6621).

Aspidium continuum Desv. Ges. Naturf. Freund. Berlin Mag. 5:320. 1811. Based on *Pteris polypodioides* Poir.

Aspidium resiniferum Kaulf. Enum. Fil. 237. 1824. Type from the Hawaiian Islands, *Chamisso* (not seen).

Aspidium venulosum Blume, Enum. 151. 1828. Type from Java, *Blume* (not seen).

Nephrodium paludosum Liebm. Dansk. Vid. Selsk. Skrift. V, 1:275. 1849. Type from San Antonio, Huatusco, Veracruz, Mexico, *Liebmann* 2658 (fragment US).

Goniopteris cheilocarpa Fée, Gen. Fil. 251. 1852. Syntypes from Brazil, *Claussen* 112, *Gardner* 53 (not seen).

Nephrodium inaequilaterum Colenso, Trans. N. Zeal. Inst. 20:229. 1888. Type from New Zealand, *Colenso* (not seen).

The very large plant of southern Brazil, with the pinnae up to 40 cm. long or more may be known as:

Thelypteris totta var. **longipinna** (C. Chr.) Morton, comb. nov.

Dryopteris gongylodes var. *longipinna* C. Chr. Dansk. Vid. Selsk. Skrift., VII, 10(2):194. 1913. There are five syntypes from Brazil, Uruguay, and Paraguay. Since I have not seen all of them, I do not choose a lectotype.

76. **Pteris polita** Link, Hort. Reg. Bot. Berol. Descr. 2:30. 1833.
Pteris propinqua Agardh, Rec. Pterid. 65. 1839.

In his original description of *Pteris propinqua* Agardh quoted *P. polita* Link as a synonym with a query, evidently not being sure enough of Link's species to adopt the name. The syntypes of *propinqua* came from Jamaica (*Bancroft, MacFadyn*). Link's *P. polita* has remained in limbo, so to speak, ever since. It was based on plants cultivated in the botanical garden in Berlin from material originally received from Brazil. In the herbarium of the Staatsinstitut für allgemeine Botanik, Hamburg, I found two sheets (Morton photographs 5449, 5450) of *P. polita* that had been collected in the Hortus Berolinensis and which are undoubtedly authentic. They bear the date 1834, which may be the date of collection or the date sent out. The data are similar to those of many other species described by Link in 1833; all have proved to be correctly named and are essentially isotypes. It is evident that Link (probably with Friedrich Otto) collected samples from the hothouses in Berlin of his new species described in his Hortus Regius Botanicus Berolinensis and distributed them widely. The specimens in Hamburg show that *P. polita* Link is truly the same as the later *P. propinqua* Agardh, and therefore the latter name, which has become rather widely known through its adoption in the Index Filicum, must be displaced. The species is widely distributed in tropical America and does grow both in Brazil, the type locality for *P. polita*, and in Jamaica, the type locality for *P. propinqua*.

77. SALVINIA ROTUNDIFOLIA Willd. *in* L. Sp. Pl., ed. 4, 5:537. 1810=**S. auriculata** Aubl. Hist. Pl. Guian. 2:969, *t. 367*. 1775.
TYPE: Brazil, *Hoffmannsegg* (B, Herb. Willd. no. 20250).

The first author to distinguish clearly between two common tropical American species of *Salvinia* was C. A. Weatherby,[45] who pointed out that *S. auriculata* Aubl. had the clusters of four hairs with the hairs united by their tips, and that *S. rotundifolia* Willd. had the hairs completely distinct and tapering at the tip. Unfortunately, he did not see the type of *S. rotundifolia* Willd. Through the courtesy of D. W. Domke, the director of the herbarium at the Botanisches Museum, Berlin-Dahlem, I was privileged to study the holotype. It is a good specimen, which is obviously the same as *S. auriculata* Aubl., closely matching *Samuels* 73, from Surinam. It is unfortunate that the name *S. rotundifolia* must disappear into synonymy, but there is no help for it. As a matter of fact, the name was considered a synonym of *S. auriculata* by J. G. Baker and by Christensen, a

[45] "A further note on Salvinia," Amer. Fern Journ. 27:98–102. 1937.

conclusion also agreed with by Miss J. Kopp in her dissertation on *Salvinia*. According to Kopp, the species that Weatherby and others following him [46] have called *S. rotundifolia* should be called *S. minima* Baker,[47] a species that was based on a collection (*Fritz Mueller* 479) from Santa Catarina, Brazil, which is presumably at the Royal Botanic Gardens, Kew, but may be in the British Museum.

78. SCHIZAEA PENICILLATA Humb. & Bonpl. ex Willd. *in* L. Sp. Pl. ed. 4, 5:86. 1810= **S. pennula** Swartz, Syn. Fil. 150, 379. 1806.

Recent authors have followed Prantl [48] in recognizing two species of *Schizaea* section *Digitata* [*Actinostachys* Wallich as a genus] from northern South America, one *S. pennula* Swartz, with nonstriate spores, and *S. penicillata* Humb. & Bonpl., with striate spores; aside from the spore difference, the latter species has smaller and fewer sorophores. However, *S. penicillata* was originally proposed merely as a change of name for *S. pennula* Swartz, and was unnecessary, and therefore was superfluous and illegitimate. Martius correctly placed *S. penicillata* as a synonym of *S. pennula*, and described the second of the species mentioned above as *S. subtrijuga* Mart.,[49] which is a correct name; the types of *S. subtrijuga* were collected by Martius from Arara-Coara and Cupati, Amazonas, Colombia.

79. TRICHOMANES AERUGINOSUM Poir. *in* Lam. Encycl. Méth. 8:76. 1808 =**Hymenophyllum aeruginosum** (Poir.) Carm. Trans. Linn. Soc. [London] 12:513. 1818.

Trichomanes hirsutum sensu DuPetit Thouars, Esq. Fl. Trist. d'Acunha 34. 1804, non L.

Hymenophyllum capillare Desv. Mém. Soc. Linn. Paris 6:333. 1827. Type: Tristan d'Acunha Island, *DuPetit Thouars* (presumably P, not seen).

Hymenophyllum fulvum van den Bosch, Nederl. Kruidk. Arch. 5(3):196. 1863. Type: Tristan d'Acunha, collector unknown [but surely DuPetit Thouars] (holotype in Herb. Berlin [not seen], fragment of holotype L, Morton photographs 1551, 2532). Van den Bosch originally gave the locality as Madagascar, but subsequently wrote on the sheet "Tristan d'Acunha, *Thouars*"; his plants are thus very likely a part of the same collection as the type of *H. capillare*.

TYPE: Tristan d'Acunha Island, *Bory de St. Vincent* (holotype P, Morton photograph 4546).

The name *Hymenophyllum capillare* Desv. has commonly been applied to a species of Madagascar, Réunion, and tropical Africa.

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[46] Dr. Elias de la Sota has published several valuable papers on *S. auriculata*, *S. rotundifolia* sensu Weatherby, and other species. See Darwiniana 12:465–520. 1962; 612–623. 1963.

[47] Journ. Bot. Brit. & For. 1886:98.

[48] Untersuchungen zur Morphologie der Gefässkryptogamen 2:132. 1881.

[49] Icon. Crypt. Vasc. 117. 1834.

However, the type came from the little island of Tristan d'Acunha in the South Atlantic Ocean, and only one species of this alliance grows there, the previously and generally recognized species *H. aeruginosum* (Poir.) Carm., of which *H. capillare* must be a synonym. If the African and Mascarene Island plants should prove to be different,which may very well be true, then the proper name for them will be *H. pendulum* Bory, which was based on a plant collected on Réunion Island by Bory de St. Vincent.

80. TRICHOMANES MUSCOIDES Swartz, Journ. Bot. Schrad. 1800 (2):95. 1801=
Trichomanes hymenoides Hedwig, Fil. Gen. Sp. *t. 3, f. 3.* 1799.

Swartz gave a description of his *T. muscoides* but cited "Hedw. icon. fil." as a synonym, and later the exact illustration of Hedwig intended is indicated by Swartz in his Synopsis Filicum (p. 142. 1806) as *Trichomanes hymenoides* Hedwig. Therefore, *T. muscoides* Swartz should by the Code be considered as a renaming of *T. hymenoides*, superfluous and therefore illegitimate.

The typification of these names is of some interest. Hedwig indicated his species as "Habitat . . ." thus showing that he did not know the origin of his material. Swartz sent many of his specimens from Jamaica to Hedwig who illustrated them, under the names assigned by Swartz. It is likely that Swartz sent a specimen of a Jamaican species to which he had assigned the name *T. muscoides*, and that this label became lost. Hedwig retained the specimen, and described it as a new species, *T. hymenoides*. Swartz, writing just about the same time or a year later, realized what had happened, and considered his own name *T. muscoides* as having priority, and so he adopted it and placed the Hedwig plate in synonymy. This would have seemed right to him, but it is not in accordance with our current Code of Nomenclature. The Swartz specimen from Jamaica at Stockholm would be authentic, technically an isotype rather than a holotype. The holotype of Hedwig could not be located by Wessels Boer in his recent treatment of *Trichomanes* section *Didymoglossum*,[50] and so the plate was considered as typifying the species. It is likely that the holotype is actually in the herbarium in Geneva; it could be identified by comparison of the plants with Hedwig's illustration. Boer (1962) considered *T. muscoides* Swartz as a heterotypic synonym of *T. hymenoides*, and based on the Swartz collection at Stockholm, but as indicated above I believe it should be considered a homotypic synonym, a renaming of *T. hymenoides* rather than a new species independently described. A specimen collected by Swartz in Jamaica in the Rijksherbarium, Leiden (Morton photograph 2416) would probably be an isotype.

[50] Acta Bot. Neerl. 11:306. 1962.

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(Synonyms in *italics*. New species, new names, and combinations in **boldface**. Page numbers of principal entries in *italics*.)

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