Family 3. SCHIZAEACEAE

By William Ralph Maxon

Mainly tropical xerophilous plants of widely diverse form and habit. Sporangia superficial, borne singly or in rows on narrow more or less specialized lobes or terminal segments, or upon the very slender ultimate divisions of non-foliose pinnae, indusiate or non-indusiate, obovoid or pyriform (or, in the African genus *Mohria*, globose), provided with a definite subapical annulus or corona contracted distally, the sporangium dehiscing by a longitudinal fissure. Prothallia reniform to spatulate or more or less filamentous and branched, terrestrial.

Fibro-vascular bundle of the rhizome central, solid.
- Fronds twining, elongate, dorsal, apparently inserted in a single row; spores triplanate. — 1. Lygodium.
- Fronds upright or ascending, not twining, borne in several ranks; spores diplanate.
  - Fertile segments spuriously digitate; sporangia apparently borne in 4 more or less complete rows. — 2. Actinostachys.
  - Fertile segments forming a pinnate spike; sporangia obviously in 2 rows.
    - Fronds mostly linear and simple, or, if dichotomous, the few slender divisions never forming a definite lamina. — 3. Schizaea.
    - Fronds distinctly stipitate, the lamina repeatedly dichotomous, the divisions close and usually numerous. — 4. Lophidium.

Fibro-vascular bundle of the rhizome in the form of a reticulate tube. — 5. Anemia.

1. LYGODIUM Sw. Jour. Bot. Schrad. 1800[2]: 106. 1801.

Odontopteris Bernh. Jour. Bot. Schrad. 1800[2]: 127. *pl. 2, f. 4.* 1801.
Gisopteris Bernh. Jour. Bot. Schrad. 1800[2]: 129. 1801.
Ugena Cav. Ic. 6: 73. 1801.
Ramondia Mirb. Bull. Soc. Philom. 2: 179. 1801.
Hydroglossum Willd. Schr. Akad. Wiss. Erfurt. 1802: 20. 1802.
Cteisium Michx. Fl. Bor. Am. 2: 275. 1803.
Lygodictyon J. Smith, Lond. Jour. Bot. 2: 284. 1842.

Mainly plants of tropical and subtropical regions with slender vine-like twining fronds of indefinite growth, these borne dorsally and apparently in a single row upon a slender branched underground rhizome. Primary rachis wiry, more or less flexuous; leafy parts consisting of stalked subpalmately lobed, pinnate, or pinnately compound secondary pinnae arising in pairs from alternate slender or usually short naked stalks (the primary pinnae), with an included usually abortive bud, the primary pinnae thus pseudodichotomous. Sporangia strongly curved, laxly disposed in a row upon each side of the midvein of the contracted segments (sporangiophores), dorsal and solitary upon the simple pinnately arranged veinlets, protected each by a connate cucullate indusium formed of the modified leaf-tissue and opening antrorsely. Spores triplanate, yellow or whitish, smooth, verrucose, or less commonly reticulate.

Type species, *Ophioglossum scandens* L.

Sterile secondary (geminate) pinnae apparently subpalmate.
- Primary branches slender, elongate; secondary pinnae up to 6 cm. long, the lobes oblong to lanceolate, obtusish. — 1. *L. palmatum.*
- Primary branches evident as short tubercles; secondary pinnae up to 25 cm. long, the segments linear-lanceolate, acute or attenuate. — 2. *L. radiatum.*

Sterile secondary (geminate) pinnae pinnate, the tertiary segments or divisions mostly petiolate.
- Tertiary sterile segments nearly equal.
  - Veins free.
    - Rachis of secondary pinnae strongly flexuous; tertiary segments oblong-lanceolate. — 3. *L. volubile.*

Rachis of secondary pinnae nearly straight; tertiary segments similar or broadly ligulate, usually much larger. 4. *L. micans.*
Veins areolate. 5. *L. heterodoxum.*
Upper tertiary segments mostly shorter than the basal.
Rachis of secondary pinnae at most slightly flexuous.
Costae of tertiary segments nodose-articulate, the basal costulae opposite; leaf-tissue usually subopaque. 6. *L. venustum.*
Costae of tertiary segments not nodose-articulate, the basal costulae usually alternate; leaf-tissue commonly lustrous, at least above. 7. *L. mexicanum*
Rachis of secondary pinnae divaricate-flexuous.
Sterile tertiary and quaternary segments linear to linear-lanceolate from a strongly inequilateral semicordate base; rigidly coriaceous. 8. *L. cubense.*
Sterile tertiary and quaternary segments lanceolate-hastate or trifoliolate from a cuneate base; membrano-herbaceous. 9. *L. oligostachyum*

1. **Lygodium palmatum** (Bernh.) Sw. Syn. Fil. 134. 1806.

Gisopteris palmata Bernh. Jour. Bot. Schrad. 1800[2]: 129. 1801.
Ramondia palmata Bosc, Bull. Soc. Philom. 2: 179. 1801.
Hydroglossum palmatum Willd. Schr. Acad. Erfurt. 1802: 25. 1802.
Cleisium paniculatum Michx. Fl. Bor. Am. 2: 275. 1803.

Fronds 0.5–1.5 meters long; rhizome wide-creeping, 1 mm. or less in diameter, dichotomous, dark-brown, closely covered with brownish few-celled flattish hairs; stipe brownish-stramineous from a darker base, about 0.5 mm. in diameter, the rachis similar, subterete, very narrowly marginate; primary branches 5 mm. or less long, slender, the terminal bud not evident and invariably dormant; sterile secondary (geminate) pinnae petiolate (1–2.5 cm.), 2.5–6 cm. long, 3–8 cm. broad, orbicular to broadly reniform, dichotomously pedatifid ½ to ⅔ the distance to the cordate base into 4–8 unequal spreading lobes, thus subpalmate, the outer lobes small and irregularly rounded or often emarginate, the principal ones oblong to lanceolate, obtusish; costae dichotomous at the non-articulate apex of the petiole, the branches pedately forked, slightly elevated, slender, strongly flexuous, scarcely attaining the apex of the lobes; veins slender, mostly immersed, oblique, 1–3 times dichotomous; leaf-tissue membrano-papyraceous, bright-green above but scarcely lustrous in drying, much paler below, glabrescent, the margins entire or minutely repand. Fertile secondary (geminate) pinnae usually occupying the upper portion of the frond, 3–4-pinnate, deltoid-ovate to rhombic-ovate in outline, inequilateral, the tertiary segments 2–4-jugate, the costules very slender, flexuous, narrowly foliaceous, the ultimate ones dichotomous; sporangiophores oblong, flattish, obscurely crenate-serrate, up to 7 mm. long; spores delicately and minutely verrucose.

TYPE LOCALITY: Pennsylvania.
DISTRIBUTION: Low woods and thickets, New Hampshire and Massachusetts to Florida; also in Kentucky and Tennessee. Mainly coastal.
ILLUSTRATIONS: Schkuhr, Krypt. Gew. *pl. 140;* Torr. Fl. N. Y. *pl. 161;* Hook. Fil. Exot. *pl. 24;* Lowe, Ferns Brit. & Exot. 8: *pl. 74;* Willd. *loc. cit. pl. 1, f. 2;* D. C. Eaton, Ferns N. Am. *pl. 1;* Denks. Akad. Wiss. Wien 23: *pl. 17, f. 12, 13;* Ettingsh. Farnkr. *pl. 171, f. 2, 4, 5;* Britt. & Brown, Ill. Fl. *f. 13.*

2. **Lygodium radiatum** Prantl, Schiz. 66. 1881.

Lygodium digitatum D. C. Eaton, Mem. Am. Acad. II. 8: 217. 1860. Not *L. digitatum* Presl, 1825.

Fronds several meters long; rachis dull-stramineous to light-brownish, subterete, narrowly marginate, about 1.5 mm. in diameter; primary branches reduced to small knob-like protuberances upon the primary rachis; secondary (geminate) pinnae up to 25 cm. long, petiolate (3–4 cm.), obdeltoid to suborbicular in outline, either dichotomously pedatifid to within 1–2 cm. of the subtruncate or cuneate base, or, rarely, once-dichotomous; segments usually 3–7 (rarely 2), linear-lanceolate, acute or attenuate, 10–23 cm. long, 1–2.5 cm. broad, the costae stout, elevated, subflexuous toward the apex; veins elevated, directed toward the margin nearly at a right angle, mostly once or twice dichotomous, apart, the branches extending each to sharp serratures of the margin, or in fertile segments about half of them extending to the sporangiophores; leaf-tissue membrano-herbaceous, lustrous upon both surfaces, lighter and glandular below, otherwise glabrous; sporangiophores up to 6 mm. long, irregularly placed, mostly more than their width apart, sessile, serrate; spores minutely verrucose.

TYPE LOCALITY: Gatun, Panama.
DISTRIBUTION: Panama and Colombia.

3. **Lygodium volubile** Sw. Jour. Bot. Schrad. **1801**[2]: 304. 1803.

Hydroglossum volubile Willd. Sp. Pl. 5: 78. 1810.
Lygodium Wrightii D. C. Eaton; Prantl, Schiz. 78. 1881.

Fronds climbing 4–10 meters; rhizome short-creeping, corrugate, dark-brown, densely clothed with slender blackish hairs; stipe and rachis up to 3 mm. in diameter, yellowish to brownish-castaneous, subterete, narrowly marginate, puberulous, glabrescent; primary branches evident as short tubercles upon the rachis, the terminal bud inconspicuous; sterile secondary (geminate) pinnae petiolate (1.5–3 cm.), orbicular to broadly oblong-ovate, acute, 10–20 cm. long, 8–20 cm. broad, pinnate, the rachis relatively slender, subdivaricate-flexuous, stramineous to brownish, narrowly marginate, short-pubescent (especially above), glabrescent; tertiary segments 2–4 pairs, subequal, distant, petiolate (5–10 mm.), oblong-lanceolate from a broadly cuneate or rounded subtruncate (or, rarely, sharply auriculate-hastate) base, 4–15 cm. long, 1–2.5 cm. broad, the apex acute, acuminate, or rarely attenuate, the costae nodose-articulate, flexuous, elevated, stoutish, extending to the apex, bearing a few antrorse hairs; terminal segment conform, rarely confluent with the next below; veins oblique, curved, elevated, mostly 1–2 times dichotomous, glabrous; leaf-tissue coriaceo-herbaceous, bright-green, lustrous upon both surfaces, paler below, glabrous or obscurely short-pilose, the margins cartilaginous, lightly crenulate-serrate, the serrations distant. Fertile secondary (geminate) pinnae similar to the sterile in shape, pinnate or commonly bipinnate, the lower tertiary segments then deltoid, the quaternary segments 1-jugate or rarely subbijugate, opposite, short, spreading; sporangiophores numerous, terminating the stronger branch of the mostly 1–2-forked veins, up to 1 cm. long, serrate, glabrous above, sparsely short-pilose below; spores minutely punctate, obscurely subcristate-tuberculate.

TYPE LOCALITY: Jamaica.
DISTRIBUTION: Jamaica and Cuba; also from northern South America to Brazil.
ILLUSTRATION: Sloane, Hist. Jam. *pl. 46, f. 1.*

4. **Lygodium micans** Sturm, in Mart. Fl. Bras. **1**[2]: 178. 1859.

Osmunda scandens Aubl. Pl. Guian. **2**: 961. 1775.
Lygodium scandens Schkuhr, Krypt. Gew. **1**: 138, excl. syn. 1809. Not *L. scandens* Sw. 1801.

Fronds very ample, apparently high-climbing; primary rachis stout, subterete, very narrowly marginate, dull-stramineous to light-brown; primary branches evident only as stout protuberances upon the primary rachis, the terminal bud minute; sterile secondary (geminate) pinnae petiolate (2–4.5 cm.), very broadly ovate or oblong to transversely oblong, 15–30 cm. long, 15–35 cm. broad, once-pinnate, the rachis nearly straight, narrowly marginate above, brownish short-pubescent (especially above), glabrescent; tertiary segments 2–5 pairs, subequal, distant or subdistant, petiolate (5–10 mm.), broadly ligulate to oblong-lanceolate from a rounded or subcordate base, 10–25 cm. long, 1–3.8 cm. broad, the costae nodose-articulate, greatly elevated, straight, stout, extending to the apex, bearing a few scattering antrorse hairs, the terminal segment sometimes joined to the next below; veins directed toward the margin at a wide angle, 2–3 times dichotomous, the branches straight and parallel, elevated, glabrous; leaf-tissue rigidly coriaceo-herbaceous, lustrous upon both surfaces, paler below, glabrous, the margins distinctly crenate-serrate, the teeth close. Fertile secondary (geminate) pinnae similar to the sterile, the veins similarly dichotomous, nearly all the branches extending to the sporangiophores, the few sterile branches excurrent to sharp marginal teeth; sporangiophores very numerous and close, up to 1 cm. long, sharply serrate, pilose along the midvein above and at the base below; spores coarsely subcristate-tuberculate.

TYPE LOCALITY: British Guiana.
DISTRIBUTION: Panama; also in Trinidad and Guiana; accredited to Santo Domingo.
ILLUSTRATION: Schkuhr, *loc. cit. pl. 138.*

5. **Lygodium heterodoxum** Kunze, Farrnkr. 2: 32. 1849.

Hydroglossum spectabile Liebm. Vidensk. Selsk. Skr. V. 1: 299. 1849.
Hydroglossum heterodoxum Moore, Index Fil. cxiv. 1857.
Lygodictyon heterodoxum J. Smith, Ferns Brit. & For. 259. 1866.

Fronds several meters long; rhizome short-creeping, thickly clothed with short blackish few-celled flaccid hairs; stipe and rachis stramineous throughout, subterete, stoutish, up to 3 mm. in diameter; primary branches evident as mere protuberances upon the rachis or up to 5 mm. long, the terminal bud not invariably abortive; secondary (geminate) pinnae up to 50 cm. long, petiolate (3–6.5 cm.), rotund-ovate to pentagonal in outline, pinnate or at the base bipinnate, the rachis strongly flexuous, stramineous, narrowly marginate above; tertiary segments 2–4 pairs, nearly equal in length, the lowermost petiolate (1–4 cm.), cordate at the base, sometimes triangular and pinnate, bearing a pair of shorter alternate quaternary segments at the base, or subpalmately cleft into 3 or 4 elongate quaternary segments similar to the middle tertiary segments, these simple or dichotomously cleft, the divisions equal or unequal; upper tertiary segments mostly simple, falcate, the uppermost often joined to the terminal segment, this sometimes greatly elongate (up to 30 cm.) and either single or binate; middle tertiary segments (or their main divisions) in general linear-oblong, 10–20 cm. long, 1.5–3 cm. broad, or the fertile ones linear-lanceolate and narrower; costae stout, not nodose-articulate at the base, subflexuous, elevated; veins alternate, oblique, elevated, anastomosing, forming 4 or 5 ranks of areoles upon each side of the costa, the costal row unequally obdeltoid, the outer ones irregularly hexagonal, directed toward the margin; leaf-tissue rigidly herbaceous, lustrous upon both surfaces, slightly paler below, the veins and costae nearly glabrous, the margins obscurely crenulate-repand; sporangiophores up to 6 mm. long, close, sessile, serrate; spores verrucose.

TYPE LOCALITY: Oaxaca, Mexico.
DISTRIBUTION: Southern Mexico to Costa Rica; also in Venezuela.
ILLUSTRATION: Kunze, Farrnkr. *pl. 113.*

6. **Lygodium venustum** Sw. Jour. Bot. Schrad. **1801**[2]: 503. 1803.

Primary rachis subterete, usually yellowish-stramineous, very narrowly marginate, up to 2.5 mm. in diameter, pubescent; primary branches up to 1 cm. long, densely pubescent, the terminal bud usually dormant; sterile secondary (geminate) pinnae petiolate (1.5–3 cm.), oblong or broadly oblong, 15–25 cm. long, 8–20 cm. broad, once-pinnate, acute or acuminate, the rachis nearly straight, densely pubescent, slightly alate toward the apex; tertiary segments 5–8 pairs, approximate or mostly apart, slightly smaller toward the apex, all but the uppermost stalked, deltoid-ovate from a cordate base, 4–10 cm. long, 1.5–4 cm. broad at the base, the costa nodose-articulate at the base and emitting a dichotomous branch upon either side, the segment thus subpalmately 5-lobed, the middle lobe greatly elongate, usually at least twice as long as the lateral, lanceolate to oblong-lanceolate, 1–1.8 cm. broad, acute or obtuse, the margin deeply crenate-serrate or sometimes pinnately lobed, the lobes or crenations close, denticulate-serrate; costae elevated, stout, nearly straight, excurrent to the apex, pilose or pubescent; veins commonly opposite, or subopposite, very oblique, elevated, subpinnately branched, the branches close, pilose or pubescent, the hairs of the lower surface usually much shorter; leaf-tissue herbaceous, usually subopaque, glabrous or short-pubescent. Fertile secondary (geminate) pinnae similar to the sterile or often bipinnate, the lower tertiary segments with shorter basal lobes or 1–3 pairs of short mostly opposite quaternary segments, the lowest of these inequilateral and often subpalmately lobed; sporangiophores solitary upon the mostly shallow lobes, serrate, up to 8 mm. long; spores minutely verrucose.

TYPE LOCALITY: Brazil.
DISTRIBUTION: Mexico and Central America, southward to Brazil and Peru; West Indies (not common).
ILLUSTRATION: Breyn, Exot. Pl. Cent. *pl. 96.*

7. **Lygodium mexicanum** Presl, Rel. Haenk. **1**: 72. 1825.

Lygodium Schiedeanum Presl, Abh. Böhm. Ges. Wiss. V. **4**: 370. 1845.
Lygodium commutatum Presl, Abh. Böhm. Ges. Wiss. V. **4**: 370. 1845.

Rachis subterete, stramineous to yellowish-brown, very narrowly marginate, up to 2.5 mm. in diameter; primary branches 5–10 mm. long, sparingly pubescent; sterile secondary (geminate) pinnae petiolate (0.5–3 cm.), broadly ovate to deltoid-ovate, 15–28 cm.

long, 10–18 cm. broad, once-pinnate, acuminate, the rachis subflexuous, slightly or densely pubescent, foliaceo-marginate toward the apex; tertiary segments 5–8 pairs, approximate or apart, the upper ones gradually smaller, all but the uppermost petiolate, elongate deltoid-ovate or deltoid-lanceolate from a cordate base, the larger ones 3–9 cm. long, the costa not nodose-articulate at the base, emitting alternately upon each side a dichotomous branch, the segment thus subpalmately 5-lobed or by the further division of the branches rarely 7–9-lobed, the middle lobe invariably the longest, lanceolate to linear-oblong, 5–15 mm. broad, acutish or obtuse, crenate or closely and obtusely lobed, the margins bluntly or sharply denticulate; costae elevated, stoutish, usually flexuous, excurrent to the apex, pilose or often sparsely so below; costulae and veins alternate, the latter very oblique, repeatedly dichotomous or subpinnately branched, the branches close, sparingly pilose or often conspicuously so with numerous short hairs intermixed; leaf-tissue membrano-herbaceous, lustrous at least above, glabrate or minutely pilose. Fertile secondary (geminate) pinnae mostly equaling the sterile, bipinnate at the base or often so nearly throughout, the lower and middle tertiary segments oblong to narrowly deltoid, with 1–6 pairs of mainly alternate quaternary segments, the lowest of these inequilateral, often subpalmately lobed; sporangiophores solitary, serrate, up to 8 mm. long; spores minutely verrucose.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico and Central America generally, southward to Brazil.
ILLUSTRATIONS: Ettingsh. Farnkr. *pl. 170, f. 7, 8; pl. 174, f. 1, 11.*

8. **Lygodium cubense** H.B.K. Nov. Gen. & Sp. 1: 31. 1815.

Lygodium Poeppigianum Presl, Abh. Böhm. Ges. Wiss. V. 4: 363. 1845.

Rhizome creeping, slender, blackish, clothed with short dark-brown hairs; stipe 2 mm. in diameter, subterete, narrowly marginate, light-brownish or dull-stramineous from a darker hispid base; primary branches evident only as short protuberances upon the primary rachis, the terminal bud low-rotund, clothed with cinnamomeous hairs, usually dormant; sterile secondary (geminate) pinnae petiolate, in small forms linear with a single segment or binate, but usually rhombic-ovate and pinnate or subbipinnate, 10–20 cm. long and broad, the rachis strongly divaricate-flexuous, marginate, coarsely pubescent; tertiary segments 1 or 2 pairs, the upper ones linear to linear-lanceolate, petiolate or subsessile from a strongly inequilateral base, the lower side cordate, the upper cuneate, the terminal segment similar or joined to the next below, all acute or acutish, 3–13 cm. long, 3–13 mm. broad, the basal segments binate or pinnate with a single pair of quaternary segments, all similar to the upper tertiary segments; costae nodose-articulate, pubescent above, sparingly pilose below, strongly elevated, stout, extending to the apex; veins very oblique, curved, 1–4 times dichotomous, elevated, bearing a few scattering hairs above; leaf-tissue rigidly coriaceous, striate, above light- or yellowish-green, lustrous, below paler and less lustrous, whitish-glandular below (often conspicuously so), the margins a little thickened, obscurely crenate-serrulate. Fertile secondary (geminate) pinnae bipinnate or at the base subtripinnate; tertiary segments 3–4 pairs, mostly shorter than the sterile, the upper ones cuneate, deltoid-lanceolate, the middle pinnate at the base with small obdeltoid or subrhombic quaternary segments, the lowermost bipinnate at the base, the quarternary segments similar to the anterior tertiary segments; sporangiophores distant, single upon the oblique crenations, serrate, mostly 3–8 mm. long, pilose on the midvein above and at the base below, also upon the indusia; spores coarsely low verrucose-tuberculate.

TYPE LOCALITY: Near Havana, Cuba.
DISTRIBUTION: Known only from Cuba, apparently common.
ILLUSTRATION: Ettingsh. Farnkr. *pl. 169, f. 2, 7.*

9. **Lygodium oligostachyum** (Willd.) Desv. Mém. Soc. Linn. Paris **6**: 205. 1827.

Hydroglossum oligostachyum Willd. Sp. Pl. 5: 81. 1810.
Lygodium gracile Baker, Jour. Bot. 26: 35. 1888.

Fronds apparently about 2 meters long; rhizome short-creeping, blackish; stipe dull-brownish from a darker base, about 1 mm. in diameter, the rachis similar, subterete, very

narrowly marginate, rusty-puberulous, soon glabrescent; primary branches very short, knob-like, the terminal bud relatively large, usually abortive, closely invested with rusty hairs; sterile secondary (geminate) pinnae 12–30 cm. long, deltoid-ovate, inequilateral, bipinnate or at the base tripinnate, the rachis divaricate-flexuous; tertiary segments 2–4 pairs, 2–5.5 cm. apart on each side, petiolate (1–2.3 cm.), gradually smaller toward the acuminate apex, the terminal segment lanceolate or narrowly subhastate from an unequally cuneate or obliquely lobate base, usually 3–5 cm. long, 1 cm. or less broad at the base, the middle segments mostly trifoliolate, the divisions similar to the terminal segment; lowermost tertiary segments up to 13 cm. long, rhombic-deltoid, with about 3 pairs of very distant quaternary segments, these similar to the terminal tertiary segment, the lowermost often with a smaller conform free segment, distinctly stalked (5 mm.), the rachis strongly flexuous, delicately foliaceo-marginate; costules elevated, flexuous, extending to the apex; veins very oblique, 1–2 times dichotomous, or in the single basal lobes subpinnate-flabellate; leaf-tissue membrano-herbaceous, bright clear green above, paler below, essentially glabrous, the margins everywhere marked by shallow crenations, these serrulate-dentate. Fertile secondary (geminate) pinnae similar in size, at least bipinnate, always tripinnate at the base, the quaternary segments elongate-deltoid with the basal divisions short, narrowly cuneate, sessile or short-stalked, and often cleft nearly to the base into 2 unequal divisions; ultimate segments all deeply and very obliquely incised toward the base, above strongly serrate; sporangiophores usually single and terminal upon the lobes, oblong, up to 5 mm. long, obscurely pilose upon both surfaces; spores lightly tuberculate, the surfaces smooth.

TYPE LOCALITY: Near Lake Miragoân, Haïti.
DISTRIBUTION: Known only from the island of Santo Domingo.
ILLUSTRATION: Plumier, Traité Foug. *pl. 92.*

2. **ACTINOSTACHYS** Wall.; Hook. Gen. Fil. *pl. 111, A.* 1842.

Fronds simple, linear, mostly triquetrous or flattish from a dark terete or semi-terete base, prominently unicostate. Sporangiophores terminal, the divisions elongate, spuriously digitate in a penicillate tuft from a very short inconspicuous prolongation of the costa. Sporangia in 2 rows, one upon each side of the costa, but apparently in 4 more or less complete rows by the bending of the crowded sori alternately to left and right; indusium continuous, formed of the narrowly reflexed margin of the segments.

Type species, *Acrostichum digitatum* L.

Fronds 5–20 cm. long; fertile segments 3–8, 8–20 mm. long. 1. *A. Germani.*
Fronds 25–55 cm. long; fertile segments 6–14, 2–4.5 cm. long. 2. *A. Pennula.*

1. **Actinostachys Germani** Fée, Mém. Foug. **11**: 123. 1866.

Schizaea Germani Prantl, Schiz. 132. 1881.

Plants from roundish or oblong-ovoid bristly tubers 1 cm. or less long (these sunk 9–12 cm. in a substratum of humus or decayed wood), sessile or distant 1–3 cm. upon a slender ascending tortuous offshoot; fronds one or several, very slender, 5–20 cm. long, terete or angled at the dark castaneous base, above strongly costate on the under surface, thus triquetrous, in the upper part flattish, about 1 mm. broad, glabrous; fertile segments 3–8, closely penicillate, subequal, 8–20 mm. long, slender, acuminate, the costa conspicuously pilose below; sporangia in 2 rows, usually appearing to be in 4; spores delicately maculate.

TYPE LOCALITY: Sainte-Rose, Petit-Bourg, Guadeloupe.
DISTRIBUTION: Everglade Keys of Florida, growing upon decayed wood in hammocks; Guadeloupe.
ILLUSTRATION: Fée, *loc. cit. pl. 29, f. 3.*

2. **Actinostachys Pennula** (Sw.) Hook. Gen. Fil. *pl. 111, A.* 1842.

Schizaea Pennula Sw. Syn. Fil. 150, 379. 1806.
Schizaea trilateralis Schkuhr, Krypt. Gew. 1: 137. 1809.
Acrostichum Pennula Poir. in Lam. Encyc. Suppl. 1: 125. 1810.
Actinostachys trilateralis J. Smith, Lond. Jour. Bot. 1: 202. 1842.

Fronds numerous, closely fasciculate from a small ascending rhizome, stout, 25–50 cm. long, strongly triquetrous toward the dark castaneous base and usually buried a distance of

2–10 cm. in the substratum, above green and gradually flattish, lightly canaliculate upon the upper surface, about 2 mm. broad, strongly and often sharply costate below, thus unequally triquetrous nearly throughout, lustrous, glabrous; fertile segments 6–14, penicillate, 2–4.7 cm. long, 1 mm. or more broad, acuminate, at first erect and close, eventually subfalcate and divergent, unequal, the uppermost and lower ones shorter than the middle ones and sometimes dichotomous; sporangia very numerous, spuriously biseriate upon each side of the conspicuously rusty-pilose costa; spores closely and delicately maculate.

TYPE LOCALITY: Tropical America.
DISTRIBUTION: Costa Rica; Guadeloupe; also Trinidad to Uruguay.
ILLUSTRATIONS: Hook. *loc. cit.;* Schkuhr, *loc. cit. pl. 136;* Hook. & Grev. Ic. Fil. *pl. 54;* Duperrey, Voy. *pl. 27* (as *S. penicillata*).

3. **SCHIZAEA** Smith, Mém. Acad. Turin **5**: 419. 1793.

Fronds usually numerous, cespitose, erect or ascending (or the sterile ones recurved or tortuous), simple, linear or filiform, terete at the base, above flat or flattish (rarely semiterete), unicostate, or in a few species once or several times dichotomous, the divisions slender, elongate, unicostate, distant, scarcely divaricate, never forming a definite lamina. Sporangiophores terminal, the segments (5–23 pairs) pinnately arranged upon a rachiform continuation of the costa and not exceeding it in length, often much shorter. Sporangia in 2 close rows along the costa of the segments, partially protected by the narrowly reflexed indusiiform margin.

Type species, *Acrostichum pectinatum* L.

1. **Schizaea pusilla** Pursh, Fl. Am. Sept. 657. 1814.

Plants densely fasciculate, the rhizomes minute and short-creeping; fronds linear, the sterile ones numerous and intricately entangled, 2–7 cm. long, about 0.5 mm. broad, ascending, recurved and tortuous, flattish and slightly concave above, convex below, finely striate; fertile fronds rigidly erect, 4–15 cm. long, far exceeding the sterile fronds, a little thicker, straight or flexuous; sporangiophore ovate, conduplicate, the segments (3–8 pairs) oblique, 4–9 mm. long, linear-oblong, obtuse, strongly concave (the apex cucullate), the upper ones greatly reduced, the costa and margins rusty-pilose; sporangia close, 4–9 pairs; spores minutely areolate.

TYPE LOCALITY: New Jersey.
DISTRIBUTION: Pine barrens of central and eastern New Jersey, usually in sphagnum; Nova Scotia; Newfoundland.
ILLUSTRATIONS: Hook. & Grev. Ic. Fil. *pl. 48;* D. C. Eaton, Ferns N. Am. *pl. 24, f. 3;* Britt. & Brown, Ill. Fl. *f. 12.*

4. **LOPHIDIUM** Rich. Act. Soc. Hist. Nat. Paris **1**: 114. 1792.

Fronds cespitose, erect, stipitate, once to repeatedly dichotomous, the divisions usually numerous, linear and flattish, or broader and conspicuously foliose, unicostate or pluricostate, forming a definite flabelliform lamina. Sporangiophores terminal upon the excurrent costae of the leafy divisions or rarely upon special nonfoliose fronds of similar form; fertile segments simple or dichotomous, borne in a pinnate spike, not longer than the rachis of the sporangiophore. Sporangia in two rows close to the costa, crowded, somewhat protected by the recurved indusiiform margin.

Type species, *Lophidium latifolium* Rich.

Fronds similar.
  Fronds stout, rigidly erect; segments numerous, mostly 1–3 cm. broad. 1. *L. elegans.*
  Fronds weak, slender; segments few, 1–3 mm. broad. 2. *L. fluminense.*
Fronds strongly dimorphous. 3. *L. Poeppigianum.*

1. **Lophidium elegans** (Vahl) Presl, Abh. Böhm. Ges. Wiss. V. **4**: 337. 1845.

Acrostichum elegans Vahl, Symb. **2**: 104. 1791.
Lophidium latifolium Rich. Act. Soc. Hist. Nat. Paris **1**: 114. 1792.
Schizaea elegans Smith, Mém. Acad. Turin **5**: 419. 1793.
? *Schizaea Flabellum* Mart. Ic. Crypt. Bras. 115. 1834.
? *Lophidium Flabellum* Presl, Abh. Böhm. Ges. Wiss. V. **4**: 337. 1845.

Rhizome ascending or horizontal, closely covered with yellowish-brown hairs; fronds several, fasciculate, 25–70 cm. long, rigidly erect; stipes stoutish, obtusely angled, sulcate and brownish in the lower part, lighter and marginate above; lamina abruptly expanded, broadly obdeltoid or suborbicular in outline, 10–20 cm. long, 15–30 cm. broad, 2–6 times dichotomously cleft or incised, the divisions variable, linear-oblong or linear to narrowly obdeltoid, pluricostate, the apices deeply and usually irregularly fimbriate-dentate or sharply lacerate by the production of the prominent costae; sporangiophores numerous, terminal upon many of the elongate costae, recurved, conduplicate or with age diffuse, 6–10 mm. long; fertile segments 10–15 pairs, slender, the lower ones 2.5–5 mm. long, the upper ones gradually shorter, obtuse, conspicuously pilose upon the costa and margins; spores delicately and minutely verrucose.

TYPE LOCALITY: Trinidad.
DISTRIBUTION: Southern Mexico and Central America; Jamaica; Santo Domingo (rare); also in South America.
ILLUSTRATIONS: Vahl, Symb. *pl. 50*; ? Mart. Ic. Crypt. Bras. *pl. 55, f. 2*; ? Ettingsh. Farnkr. *pl. 175, f. 1*; E. & P. Nat. Pfl. 1^4: *f. 193, C, D*.

2. **Lophidium fluminense** (Miers) Underwood.

Schizaea fluminensis Miers; Sturm, in Mart. Fl. Bras. 1^2: 184. 1859.

Rhizome slender, horizontal, densely rusty-pilose; fronds 1–3, erect or ascending, 4–30 cm. long; stipe 3–24 cm. long, the lower portion to a distance of 3–15 cm. usually brownish and tortuous from being buried in humus, the upper portion flattish, slender, stramineous, at the summit greenish-marginate, passing gradually into the lamina, sparingly pilose; lamina narrowly obdeltoid in outline, narrowly cuneate, 2–7.5 cm. long, 1.5–4 cm. broad, 2 or 3 times dichotomous (rarely simple), the segments obliquely ascending, 1–3 mm. broad, unicostate or, if bicostate, cleft at the summit, each costa produced and developing a sporangiophore; sporangiophores 6–15 mm. long, incurved, conduplicate; fertile segments 7–14 pairs, slender, linear, pilose along the costae and margins, the lower and middle ones about equal, the upper ones shorter; spores delicately verrucose.

TYPE LOCALITY: Near Panuré, by the Rio Uaupés, Brazil.
DISTRIBUTION: Grenada and Jamaica, rare; also in Brazil, and reported from Guiana and Bolivia.
ILLUSTRATION: Mart. Fl. Bras. 1^2: *pl. 15, f. 2*.

3. **Lophidium Poeppigianum** (Sturm) Underwood.

Schizaea Poeppigiana Sturm, in Mart. Fl. Bras. 1^2: 181. 1859.
Schizaea occidentalis Griseb. Cat. Pl. Cuba 273. 1866.

Rhizome relatively stout, short-creeping, densely clothed with lustrous castaneous hairs; fronds fasciculate, erect, the fertile ones usually far surpassing the sterile. Sterile fronds erect, 15–30 cm. long; stipes pilose, dull-stramineous from a darkish base, concave-marginate along the anterior face, convex below; lamina orbicular (the divisions spreading), 10–12 cm. broad, in drying conduplicate and broadly obdeltoid, 5–8 times dichotomous, the ultimate divisions linear, 1–2 mm. broad, acutish, unicostate, the costa elevated above, scarcely so below, the margins thickened and conspicuously scabrous at the upper surface. Fertile fronds stouter, 30–50 cm. long, 3 or 4 times dichotomous, the ultimate divisions slender; sporangiophores strongly incurved (straight at first), 1.5–2 cm. long, conduplicate, the segments (15–25 pairs) slender, the middle ones distinctly the longest, the margins and costae pilose; spores delicately and very minutely verrucose.

TYPE LOCALITY: Ventanilla de Cassapillo, Peru.
DISTRIBUTION: Eastern Cuba; also from Costa Rica to Peru and British Guiana.

5. **ANEMIA**[1] Sw. Syn. Fil. 6, 155. 1806.

Ornithopteris Bernh. Neues Jour. Bot. Schrad. 1^2: 40. 1806.
Anemidictyon J. Smith; Hook. Gen. Fil. *pl. 103*. 1842.
Trochopteris Gardn. Lond. Jour. Bot. 1: 74. 1842.
Coptophyllum Gardn. Lond. Jour. Bot. 1: 133. 1842.
Aneimidictyum Presl, Abh. Böhm. Ges. Wiss. V. 4: 351. 1845.
Anemirhiza J. Smith, in Seemann, Bot. Voy. Herald 243. 1854.
Aneimiaebotrys Fée, Crypt. Vasc. Brés. 1: 267. 1869.

Fronds either in several ranks and cespitose upon a horizontal or ascending rhizome-

[1] Often written *Aneimia*, here regarded as a variant spelling.

or distichous and dorsal upon a creeping rhizome, mostly erect or ascending, the laminae mostly free-veined, pinnatifid to pinnately decompound, some of them wholly fertile (the fronds thus dimorphous), or with only the basal pair of pinnae fertile, these usually elongate and erect or nearly so, commonly surpassing the sterile portion of the lamina; sporangia borne in a close single row upon either side of the ultimate divisions of the fertile pinnae, these usually either very slender and semi-terete (the sporangia thus non-indusiate), or narrowly foliose and functioning as indusia; spores triplanate.

Type species, *Osmunda Phyllitidis* L.

Fronds in several ranks, only the basal pinnae fertile.
- Fertile pinnae at or near the base of the sterile lamina; indusium wanting.
  - Veins anastomosing or casually connivent.
    - Veins copiously anastomosing, the areoles ample; pinnae rounded at the base. 1. *A. Phyllitidis.*
    - Veins mostly free, casually connivent; pinnae smaller, mostly cuneate. 2. *A. Underwoodiana.*
  - Veins invariably free.
    - Pinnae not incised.
      - Sterile lamina obtuse or truncate, less than 10 cm. long.
        - Stipes of fertile fronds much shorter than the sterile fronds. 3. *A. humilis.*
        - Stipes of fertile fronds mostly surpassing the sterile fronds.
          - Leaf-tissue rigidly coriaceous, lustrous above; margins subentire or undulate. 4. *A. oblongifolia.*
          - Leaf-tissue membranous, opaque; margins denticulate-crenate. 5. *A. obovata.*
      - Sterile lamina acutish to acuminate, usually more than 10 cm. long.
        - Sterile lamina of a deltoid type; leaf-tissue long-pilose, especially above. 6. *A. hirta.*
        - Sterile lamina oblong-lanceolate; leaf-tissue glabrate or minutely hispid above.
          - Sterile lamina about 17 cm. long, 5.5 cm. broad, shorter than the fertile pinnae. 7. *A. affinis.*
          - Sterile lamina 27–29 cm. long, 9 cm. broad, much longer than the fertile pinnae. 8. *A. Donnell-Smithii.*
    - Pinnae (at least the lower ones) incised, cleft, or pinnatifid.
      - Pinnae deeply cleft, the segments distant and narrow. 9. *A. hirsuta.*
      - Pinnae crenately incised or lobed, the lobes often shallow.
        - Pinnae narrowly oblong to oblong-lanceolate, the lower ones lightly crenately incised. 10. *A. pastinacaria.*
        - Pinnae broadly oblong to rhombic-ovate, the lower ones crenately lobed. 11. *A. jaliscana.*
- Fertile pinnae borne distinctly below the base of the sterile lamina; indusiate.
  - Fertile pinnae flattish, *i. e.*, the divisions not paniculate.
    - Plants small, less than 5 cm. high. 12. *A. Brandegei.*
    - Plants 50 cm. or more high. 13. *A. aspera.*
  - Fertile pinnae greatly altered, the divisions paniculate.
    - Pinnules of the sterile frond mostly anadromous, only those of the upper third of the lamina catadromous.
      - Pinnules very obliquely incised or pinnatifid, the segments numerous, narrow, acute, serrate or pinnately incised. 14. *A. anthriscifolia.*
      - Pinnules pinnately parted, the segments fewer, broader, obtuse, crenate or crenately lobed. 15. *A. guatemalensis.*
    - Pinnules of the sterile frond mostly catadromous, only those of the basal pinnae anadromous.
      - Stipe and rachis light-stramineous; fertile pinnae ascending, much shorter than the sterile lamina. 16. *A. Rosei.*
      - Stipe and rachis fuscous-stramineous; fertile pinnae erect, surpassing the sterile lamina. 17. *A. Karwinskyana.*

Fronds distichous, dorsal, dimorphous, or, if only the basal pinnae fertile, these remote from the sterile lamina; indusiate.
- Fronds dimorphous, *i. e.*, wholly fertile or sterile.
  - Small or slender plants, the leaf-tissue firmly membranous.
    - Sterile lamina bipinnate only at the base; segments narrowly obovate, long-cuneate. 18. *A. Wrightii.*
    - Sterile lamina bipinnate or tripinnatifid; segments rhombic-ovate to rhombic-oblong. 19. *A. cicutaria.*
  - Stouter plants, the leaf-tissue rigidly coriaceous.
    - Segments subentire or nearly so; fertile fronds 10–22 cm. long. 20. *A. portoricensis.*
    - Segments sharply inciso-denticulate; fertile fronds 25–45 cm. long. 21. *A. aurita.*

Fronds not dimorphous, *i. e.*, only the basal pinnae fertile.
- Sterile lamina simply pinnate.
  - Leaf-tissue membrano-chartaceous, the veins elevated on both

surfaces; fertile pinnae exceeding the sterile lamina, often greatly so. 22. *A. mexicana.*
Leaf-tissue very coriaceous, the veins impressed above; fertile pinnae invariably shorter than the sterile lamina, usually much so. 23. *A. speciosa.*
Sterile lamina at least bipinnatifid at the base.
Pinnae remote, strongly ascending, the pinnules and segments very oblique and slender; tissue rigidly herbaceous. 24. *A. cuneata.*
Pinnae contiguous, spreading, the pinnules or segments spreading and broader; tissue coriaceous.
Sterile lamina bipinnatifid or (rarely) bipinnate at the base, 5 cm. or less long. 25. *A. coriacea.*
Sterile lamina bipinnate to quadripinnatifid, much larger. 26. *A. adiantifolia.*

1. **Anemia Phyllitidis** (L.) Sw. Syn. Fil. 155. 1806.

Osmunda Phyllitidis L. Sp. Pl. 1064. 1753.
Anemia longifolia Raddi, Pl. Bras. 1: 69. 1825.
Anemia cordifolia Presl, Rel. Haenk. 1: 73. 1825.
Anemia Haenkii Presl, Rel. Haenk. 1: 74. 1825.
Anemidictyon Phyllitidis J. Smith, in Hook. Gen. Fil. *pl. 103*. 1842.
Aneimidictyum Haenkii Presl, Abh. Böhm. Ges. Wiss. V. 4: 354. 1845.
Aneimidictyum Haenkii cordifolium Presl, Abh. Böhm. Ges. Wiss. V. 4: 354. 1845.

Rhizome ascending; fronds several, fasciculate, the stipe of the fertile fronds sometimes surpassing the sterile fronds, rarely much so. Fertile fronds (including the elongate fertile pinnae) 25–70 cm. long; stipe 15–48 cm. long, usually much longer than the sterile lamina, rusty fibrillose-villous, sometimes thickly so, commonly glabrescent with age, stramineous, sulcate; sterile lamina broadly ovate-oblong to orbicular, 7–28 cm. long, 8–25 cm. broad, simply pinnate, the rachis similar to the stipe; pinnae 2–7 pairs, approximate or rarely apart, somewhat ascending (or the lower ones spreading), sessile or mostly short-petiolate, subequal, or in odd-pinnate fronds the upper ones gradually smaller; lower pinnae 4–14 cm. long, 1.5–3.5 cm. broad, ovate to ovate-lanceolate or lanceolate, acute or acuminate, often attenuate, mostly falcate or subfalcate, at the base subequally rounded, less commonly subcordate or truncate, above the base inequilateral, the lower side the broadest, the costa stout, yellowish, excurrent to the apex, rusty-pilose; succeeding pinnae similar, the upper ones usually cuneate or even excavate at the upper side of the base, rounded below, the uppermost sometimes semi-adnate below; terminal pinna (if present) usually a little larger than the next below, truncate or inequilateral at the base, rarely joined to 1 or 2 below; veins slightly elevated above, usually subimmersed below, copiously anastomosing, the areoles ample, elongate, oblique; leaf-tissue herbaceo-subcoriaceous, somewhat lustrous above, paler and minutely glandular below, rigidly and sparingly pilose among and upon the veins both above and below, usually glabrescent; margins crenulate to irregularly dentate, delicately cartilaginous, whitish; fertile pinnae 8–34 cm. long, usually exceeding the sterile lamina (often much so), the panicle commonly as long as the stalk or longer, the branches usually close, with very numerous copiously fertile segments; spores striate, echinulate. Sterile fronds smaller than the fertile, often only one half as long, rarely up to 65 cm. long; lamina similar to that of the fertile frond.

TYPE LOCALITY: Santo Domingo.
DISTRIBUTION: Greater Antilles (not common); Mexico and Central America generally; also in South America.
ILLUSTRATIONS: Plumier, Traité Foug. *pl. 156;* Raddi, Pl. Bras. 1: *pl. 8;* Presl, Rel. Haenk. 1: *pl. 11, f. 3* (as *A. cordifolia*); Hook. *loc. cit.;* Lowe, Ferns Brit. & Exot. 8: *pl. 71;* J. Smith, Ferns Brit. & For. *f. 144;* E. & P. Nat. Pfl. 1⁴: 370. *f. 198, A.*

2. **Anemia Underwoodiana** Maxon, sp. nov.

Rhizome relatively small, erect, the fronds few and closely clustered, the stipe of the fertile fronds equaling or scarcely equaling the sterile fronds. Fertile fronds 20–35 cm. long; stipe 12–18 cm. long, rusty fibrillose-pilose, thickly so at first, stramineous, darker at the base, sulcate; sterile lamina deltoid to broadly ovate-deltoid, 7–16 cm. long, 7–14 cm. broad, simply pinnate, acuminate, the rachis compressed and densely rusty-pilose; pinnae 3–7 pairs, approximate, contiguous or somewhat imbricate, ascending or the lowermost spreading, these the largest, sessile, oblong-lanceolate, attenuate, subequally and broadly cuneate or sometimes slightly rounded at the upper side; upper pinnae gradually

shorter, more narrowly cuneate, essentially equilateral, lanceolate, the uppermost 2 or 3 usually confluent, forming a deeply lobed or parted acuminate terminal segment; leaf-tissue papyraceo-membranous, livid-green and lustrous above, a little paler below, pellucid, minutely glandular below, rusty pilose-scabrous upon both surfaces, mainly along the veins and nearly median midvein; veins elevated above, apparent below, close, very oblique, repeatedly dichotomous, mostly free, casually connivent; margins unevenly crenulate-undulate, slightly thickened; fertile pinnae 14–18 cm. long, equaling or slightly exceeding the sterile lamina, the panicle nearly as long as the slender rusty-pilose stalk, the divisions short, the basal ones distant; spores striate, echinulate. Sterile fronds shorter than the fertile, otherwise similar, the lamina and the stipe about equal in length.

Type collected near Castleton, Jamaica, altitude about 150 meters, April, 1903, *Underwood 1971* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Jamaica, Cuba, and Haïti, common, from near sea level up to 900 meters or more.

3. **Anemia humilis** (Cav.) Sw. Syn. Fil. 156. 1806.

Osmunda humilis Cav. Ic. 6: 69. 1801.
Anemia pilosa Mart. & Gal. Mém. Acad. Brux. 15⁵: 19. 1842.
Anemia Seemanni Hook. Lond. Jour. Bot. 7: 564. 1848.
Anemia oblongifolia humilis Hook. & Baker, Syn. Fil. 431. 1868.

Rhizome ascending or decumbent, stout; fronds closely fasciculate, the stipes of the fertile fronds usually much shorter than the sterile fronds. Fertile fronds (including the greatly elongate fertile pinnae) 10–30 cm. long; stipe 1–7 cm. long, stramineous, strongly arcuate at the base, sparsely villous above, finally glabrate; sterile lamina obovate-oblong to obovate or rarely oblong, 1–7 cm. long, 1–3 cm. broad, obtuse, once-pinnate, the rachis similar to the stipe; pinnae 2–9 pairs, spreading or the lower ones slightly deflexed and the upper a little ascending, the terminal usually larger than those next below, broadly rotund or deltoid from a cuneate base; middle pinnae contiguous or subimbricate, trapezoid-oblong, inequilateral, cuneate at the base below, rounded-truncate at the base above and close to the rachis; basal pinnae shorter, rounded-ovate from a cordate base; leaf-tissue rigidly membrano-coriaceous, usually lustrous above, opaque and paler below, conspicuously pilose and sparsely glandular upon both surfaces, often scabrous above from the tuberculate bases of the stiffish antrorse yellowish-white hairs; margins thickish, crenulate; fertile pinnae greatly elongate, 9–23 cm. long, far surpassing the sterile lamina, the stalk slender, 3–5 times as long as the panicle, stramineous, sparsely villous or glabrate, the panicle usually dense, the inferior segments often remote; spores narrowly striate, echinulate toward the angles. Sterile fronds rosulate, very short-stipitate; lamina 2–9 cm. long, 1–3.5 cm. broad, narrowly obovate or obovate-oblong; pinnae 2–9 pairs, close, the lower ones much reduced and broadly cuneate.

TYPE LOCALITY: Island of Taboga, Panama.
DISTRIBUTION: Mexico and Central America to Colombia, Venezuela, and Brazil.
ILLUSTRATIONS: Cav. Ic. *pl. 592, f. 3*; Mart. & Gal. *loc. cit. pl. 2, f. 1*; Hook. *loc. cit. pl. 16*; Schkuhr, Krypt. Gew. *pl. 141*.

4. **Anemia oblongifolia** (Cav.) Sw. Syn. Fil. 156. 1806.

Osmunda oblongifolia Cav. Ic. 6: 69. 1801.

Rhizome oblique; fronds fasciculate, the stipes of the fertile fronds mostly surpassing the sterile fronds. Fertile fronds (including the elongate fertile pinnae) 9–30 cm. long; stipe 5–13 cm. long, stoutish, sulcate, dark-stramineous, sparsely villous, glabrate; sterile lamina oblong, obtuse, 4–7 cm. long, 1.5–2.8 cm. broad, once-pinnate, the rachis similar to the stipe; pinnae 6–12 pairs, contiguous or apart, spreading, sessile, the middle ones trapezoid-oblong, obtuse, narrowly rounded-cuneate below, rounded-truncate above and contiguous to the rachis, the lower ones similar but a little shorter, inequilateral, exciso-cuneate below, the terminal pinna as large as those next below (or larger), cuneate, the outer portion rotund or sharply truncate; leaf-tissue coriaceous, lustrous above, opaque and paler below, more or less pilose, sparsely glandular below; margins thickened, repand, subentire or undulate; fertile pinnae elongate, 12–20 cm. long, far exceeding the sterile lamina, the stalks slender or stoutish, 3–4 times as long as the panicle, the panicle dense, the lower

segments usually remote; spores broadly striate, not echinulate. Sterile fronds with stoutish stipes, spreading; lamina oblong, 3.5–7 cm. long, 1.5–3 cm. broad; pinnae 5–13 pairs, spreading, similar to those of the sterile lamina of the fertile frond.

TYPE LOCALITY: Panama.
DISTRIBUTION: Panama; also in Colombia and Brazil.
ILLUSTRATIONS: Cav. Ic. *pl. 592, f. 2;* Schkuhr, Krypt. Gew. *pl. 141;* Ettingsh. Farnkr. *pl. 172, f. 12.*

5. **Anemia obovata** (Underw.) Maxon, sp. nov.

Ornithopteris obovata Underwood, MS.

Rhizome decumbent, relatively stout; fronds cespitose, the stipes of the fertile fronds scarcely or considerably surpassing the sterile fronds. Fertile fronds (including the fertile pinnae) 8–21 cm. long; stipe 5–13 cm. long, very slender, deeply sulcate, rusty-pilose, stramineous throughout or darker at the base; lamina ovate or oblong-ovate, 3–6 cm. long, 2.5–4.2 cm. broad, obtuse, once-pinnate, the rachis slight, rusty-pilose or glabrate; pinnae 2–4 pairs, opposite, approximate, spreading, the lowermost sessile, elliptic-oblong, unequally cuneate, those above narrower, subsessile, symmetrical, the uppermost narrowly obovate and semiadnate, the terminal segment much longer, obovate, cuneate, simple or deeply bilobed; margins thickened, unequally denticulate-crenulate, not lobed; leaf-tissue membranous, opaque, dull-greenish above, glabrate or very sparingly pilose above, below glabrous and minutely glandular; veins elevated above, scarcely so below; fertile pinnae 3.5–8.5 cm. long, easily surpassing the sterile lamina, the closely branched panicle shorter that the slender stalk; spores broadly striate, echinulate. Sterile fronds 5–10 cm. long, the lamina as long as the stipe, similar to that of the fertile frond.

Type collected in Cuba, 1865, *Wright 3933* in part (herb. N. Y. Bot. Gard.), the other portion of the number being *A. pastinacaria* Moritz.
DISTRIBUTION: Known only from the type number.

6. **Anemia hirta** (L.) Sw. Syn. Fil. 155. 1806.

Osmunda hirta L. Sp. Pl. 1064. 1753.
? *Anemia abscissa* Schrad. Gött. Gel. Anz. 1824: 864. 1824.
Anemia Breuteliana Presl, Abh. Böhm. Ges. Wiss. V. 4: 350, as to type (excl. syn. and plate cited). 1845.
Aneimidictyum hirtum Presl, Abh. Böhm. Ges. Wiss. V. 4: 352, in part. 1845.

Rhizome ascending, stoutish; fronds 3–6, fasciculate, mostly fertile, the stipe of the fertile fronds scarcely exceeding the sterile fronds. Fertile fronds 20–35 cm. long; stipe 13–21 cm. long, stoutish, dull-stramineous, canaliculate, densely rusty-villous; lamina deltoid to broadly ovate-deltoid, 8–15 cm. long, 6–11 cm. broad, once-pinnate, acute, the rachis subflexuous, clothed like the stipe; pinnae 6–13 pairs, approximate or contiguous, spreading, the lowermost the largest, sometimes deflexed, short-petiolate, strongly inequilateral at the base, widely exciso-cuneate below, truncate and rounded above, obliquely lanceolate, broadest above the middle (up to 2 cm.), acute, the margin minutely and irregularly crenulate, slightly thickened; succeeding pinnae gradually smaller, short-petiolate, only the uppermost narrowly adnate, oblong-spatulate, finally confluent at the acuminate or subcaudate apex; leaf-tissue membrano-papyraceous, dull-greenish, paler below; veins prominent above, subimmersed below, pilose upon both surfaces but especially above; fertile pinnae 8–17 cm. long, slightly surpassing the sterile lamina, the stalks about one-half longer than the close panicle, pilose; spores striate-cristate, echinulate. Sterile fronds few, similar to the fertile, the lamina slightly larger.

TYPE LOCALITY: Near Leogane, Haïti.
DISTRIBUTION: Haïti, Porto Rico, St. Kitts, Guadeloupe, and Martinique; also in South America?
ILLUSTRATION: Plumier, Traité Foug. *pl. 157.*
Note.—The Porto Rican specimens average about one-half smaller than the measurements given in the description.

7. **Anemia affinis** Baker, in Hook. & Baker, Syn. Fil. ed. 2. 525. 1874.

Rhizome apparently horizontal; fronds few, fasciculate, erect, the stipe of the fertile fronds scarcely exceeding the sterile fronds. Mature fertile fronds (including the greatly

elongate fertile pinnae) 45–60 cm. long; stipe 28–38 cm. long, slender, subflexuous, stramineous, naked; sterile lamina oblong-lanceolate, acutish, about 17 cm. long and 5.5 cm. broad, the rachis slender, flexuous; pinnae about 8 pairs, approximate or mostly apart, spreading, inequilateral, oblong to oblong-oval, obliquely exciso-cuneate below at the base, obtusely truncate above, the apex obtuse, the margins with an occasional crenation, otherwise irregularly fimbriate-crenulate, scarcely thickened; upper pinnae gradually smaller, the uppermost relatively narrower, very oblique, confluent at the slender apex; leaf-tissue papyraceous, dull-greenish and hispid with very short brownish hairs above, below slightly paler, glabrate and very minutely glandular, appearing pustulate by the contraction of the veins in drying; veins elevated above, scarcely so below; fertile pinnae 18–23 cm. long, erect or ascending, surpassing the sterile lamina, the panicle laxly short-branched, nearly glabrous, much shorter than the slender subflexuous stalk. Sterile fronds similar but shorter, the stipe relatively much shorter.

TYPE LOCALITY: Sierra Madre of northwestern Mexico.
DISTRIBUTION: Known only from the original specimens (*Seemann 1951*).

8. **Anemia Donnell-Smithii** Maxon, sp. nov.

Rhizome and sterile fronds wanting. Fertile fronds ample, the sterile lamina as long as the stipe or longer; stipe relatively very slender, 20–25 cm. long, canaliculate, dark-stramineous, sparsely rusty-pilose, especially toward the base; sterile lamina oblong-lanceolate, acutish, 27–29 cm. long, 9 cm. broad near the base, once-pinnate, the rachis slender, rusty pilose, glabrescent; pinnae about 14 pairs, approximate or contiguous, spreading, the lower ones about 4.5–5 cm. long, 2–2.5 cm. broad, opposite, rectangular-oval from an unequally and narrowly cuneate base, the upper side less oblique than the lower at the base, the apex obtuse, the margins finely and unequally fimbriate-crenulate, slightly thickened; upper pinnae very gradually smaller, alternate, all but the uppermost sessile, these ascending, semiadnate, spatulate, slightly decurved, greatly reduced, finally confluent and forming a slender lobed subcaudate terminal segment; leaf-tissue papyraceo-membranous, above dark-green, glabrous or with a few very short minute hairs between the elevated veins, below lighter, glabrous, minutely and sparingly glandular, the veins immersed; fertile pinnae 11–21 cm. long, diverging at a wide angle from the much longer sterile lamina, the panicle pilose, a little shorter than the stalk, stout, with strong close branches, the lower ones apart; spores striate, not echinulate.

Type collected at Rio Permejo, Department of Santa Barbara, Honduras, altitude about 1800 meters, December, 1888, *C. Thieme*, distributed by Capt. John Donnell Smith under *no. 5664* (U. S. Nat. Herb. *no. 830288*).
DISTRIBUTION: Known only from the type collection.

9. **Anemia hirsuta** (L.) Sw. Syn. Fil. 156. 1806.

Osmunda hirsuta L. Sp. Pl. 1064. 1753.

Rhizome horizontal, short-creeping; fronds several, clustered, the stipe of the fertile fronds usually surpassing the sterile fronds. Fertile fronds (including the elongate fertile pinnae), 15–43 cm. long; stipe 5–27 cm. long, usually slender, stramineous or sometimes castaneous or darker (especially at the base), hirsute, glabrescent; sterile lamina oblong-lanceolate to ovate-oblong, or sometimes deltoid-ovate, 3–15 cm. long, 2–6 cm. broad, gradually narrowed toward the apex, pinnate; pinnae 6–14 pairs, remote or contiguous, spreading, acutish, the lower and middle ones truncate at the base above, cuneate and often widely excised below, subsessile, oblong to ovate-oblong, deeply and obliquely cleft into several subequal distant linear or narrowly cuneate segments, these irregularly toothed, the basal one sometimes broader; upper pinnae cuneate both above and below, narrow, scarcely incised, the uppermost confluent, forming a narrow cuneate terminal segment; leaf-tissue firmly herbaceous, lustrous above, paler below, pilose above, more laxly so and sparingly glandular below, striate in drying, the veins conspicuously elevated above; fertile pinnae 7–23 cm. long, the stalk usually far surpassing the sterile lamina, the panicle usually close; spores cristate-striate, the ridges minutely echinulate or scabrous. Sterile fronds 7–25 cm. long; stipe 2–14 cm. long; lamina similar to that of the fertile frond or often relatively narrower, sometimes a little larger.

TYPE LOCALITY: Jamaica.
DISTRIBUTION: Jamaica, Santo Domingo, and Porto Rico, and on the continent from Mexico and Central America southward to Brazil.
ILLUSTRATIONS: Plumier, Traité Foug. *pl. 162;* Ark. Bot. 1: *pl. 12, f. 3.*

10. **Anemia pastinacaria** Moritz; Prantl, Schiz. 110. 1881.

Anemia pilosa longistipes Liebm. Vidensk. Selsk. Skr. V. 1: 301. 1849.
Anemia longistipes C. Chr. Index Fil. 53. 1905.

Rhizome horizontal; fronds several, the stipe of the fertile fronds surpassing the sterile fronds, often greatly so. Fertile fronds (including the greatly elongate fertile pinnae) 18–48 cm. long; stipe 7–25 cm. long, slender, stramineous or darker at the base, glabrescent; sterile lamina ovate-deltoid, sometimes narrowly so, 4–8.5 cm. long, 2.5–5.5 cm. broad, pinnate, acutish to acuminate, the rachis slender, glabrescent; pinnae 6–10 pairs, approximate or nearly their width apart, the lower ones spreading, the others ascending, all but the uppermost subsessile; lower and middle pinnae strongly inaequilateral at the base, long-cuneate below, above obtusely truncate, obliquely oblong, the apex obtuse or acutish, the margins thickened, irregularly denticulate-crenulate, commonly with a few very shallow oblique incisions, especially upon the upper margin; upper pinnae gradually smaller, narrower, semiadnate, abruptly confluent at the apex; leaf-tissue rigidly membranous to herbaceo-coriaceous, opaque, dull-greenish above, lighter below, sparingly pilose above, glabrescent below; veins elevated above, nearly concealed below; fertile pinnae 10–23 cm. long, 1½–2½ times as long as the sterile lamina, the stalks a little longer than the closely branched panicle; spores striate, the ridges with numerous slender columnar processes. Sterile fronds 8–23 cm. long, the stipe as long as the lamina; lamina 4–11.5 cm. long, 3–5 cm. broad, ovate-oblong or rarely deltoid-ovate, otherwise resembling the sterile lamina of the fertile fronds.

TYPE LOCALITY: Rocky situations, valley of the Rio Tigre, Colombia.
DISTRIBUTION: Southern Mexico and Central America; Cuba (rare); also in northern South America.
ILLUSTRATION: Hook. Gen. Fil. *pl. 90* (as *A. mandioccana*), erroneously ascribed by writers to *A. hirta*.

11. **Anemia jaliscana** Maxon, sp. nov.

Rhizome horizontal; fronds several, clustered, the stipe of the fertile fronds usually surpassing the sterile fronds. Fertile fronds (including the elongate fertile pinnae) 15–32 cm. long; stipe 9–20 cm. long, slender, stramineous, glabrate or with a few long rusty hairs; lamina broadly deltoid-oblong, 4–10 cm. long, 2.5–6 cm. broad, pinnate, tapering gradually from the base, the apex obtuse, the rachis slender, greenish-stramineous; pinnae 5–7 pairs, contiguous, spreading, sessile, variable, obliquely and broadly oblong to rhombic-ovate, strongly inaequilateral at the base, long-cuneate, lightly and irregularly toothed to deeply lobed, or the lowermost exciso-cuneate at the base below, obtusely truncate above, sometimes pinnatifid at the base, the apex obtuse; upper pinnae gradually narrower, cuneate, the uppermost sometimes greatly reduced and subconfluent, forming a deeply lobed terminal segment, or scarcely reduced, the terminal segment nearly conform, obovate, cuneate; leaf-tissue membranous, dull-greenish and conspicuously short-hispid above, below much paler, minutely glandular, and with a few scattered hairs; veins elevated above, immersed below; margins thickened, irregularly dentate-crenulate; fertile pinnae 8–14 cm. long, surpassing the sterile lamina, the stalk 2–4 times as long as the usually dense panicle; spores sharply cristate, the ridges scabrous. Sterile fronds about one half as long as the fertile; stipe and lamina about equal, otherwise similar to those of the fertile frond.

Type collected on cool grassy bluffs of barranca near Guadalajara, State of Jalisco, Mexico, September 15, 1891, *Pringle 3850* (U. S. Nat. Herb. *no. 50583*).
DISTRIBUTION: Known only from the State of Jalisco, Mexico; apparently common.

12. **Anemia Brandegei** Davenp. Fern Bull. **13**: 20. 1905.

Rhizome very short, ascending, closely covered with long few-celled fulvous hairs; fronds several, fasciculate, ascending or spreading (not rosulate), the stipes of the fertile fronds mostly not equaling the sterile fronds. Fertile fronds 2.5–5 cm. long; stipes deli-

cate, 1–2.5 cm. long, straight or arcuate, delicately long-pilose; lamina (including the spreading fertile basal pinnae) ovate or deltoid-ovate, 1.5–2.5 cm. long, 1–1.8 cm. broad, obtuse, the upper half obliquely pinnatifid, the lower half pinnate; primary segments and pinnae 3 or 4 pairs below the obliquely crenate-lobate apex, the basal (fertile) pinnae mostly a little shorter than the next, 5–10 mm. long, subbipinnate at the base, flattish, inequilateral, rhombic-ovate to narrowly deltoid, the divisions narrowly foliaceo-marginate, densely glandular-pilose; spores striate, smooth, the angles slightly produced; sterile pinnae and segments approximate or contiguous, the lowermost sessile, pinnatifid at the base, obliquely lobed or merely crenate, the lobes or crenations only 1 or 2 pairs, obtuse or rounded; leaf-tissue delicately herbaceous, glandular and conspicuously whitish-pilose upon both surfaces, glabrescent with age, then somewhat lustrous above. Sterile fronds similar but not exceeding 3 cm. in length; lamina deltoid, up to 1.5 cm. long, similar to the sterile portion of the fertile fronds.

TYPE LOCALITY: Cerro Colorado, vicinity of Culiacan, Sinaloa, Mexico, in shallow soil on the face of perpendicular cliffs.
DISTRIBUTION: Known only from the original specimens (*Brandegee*).
ILLUSTRATION: Davenp. *loc. cit. pl.*

13. **Anemia aspera** (Fée) Baker, Jour. Linn. Soc. **14**: 27. 1873.

Aneimiaebotrys aspera Fée, Crypt. Vasc. Brés. 1: 267. 1869.

Rhizome creeping; stipes of the fertile fronds not equaling the sterile fronds. Fertile fronds long-stipitate, the stipe about as long as the lamina, brownish-stramineous, stoutish, sulcate along the ventral face, glabrescent, at the base somewhat rough from the persistent bases of the stiff yellowish-brown hairs; lamina (including the spreading fertile basal pinnae) deltoid to deltoid-ovate, up to 35 cm. long and 26 cm. broad, tripinnate; pinnae 14–16 pairs, the fertile (basal) ones deltoid, 12–15 cm. long, up to 11.5 cm. broad at the base, with about 11 pairs of flat spreading deltoid-oblong pinnules, the lowermost basal ones of these about 6 cm. long and 2.2 cm. broad at the base, stalked (9 mm.), with about 9 pairs of flat deltoid-oblong mostly short-stalked segments, these bipinnatifid, minutely pilose; spores broadly striate, scabro-verruculose, the angles produced; sterile pinnae spreading, contiguous, petiolate from a cordate base, unequally ovate-deltoid, acuminate, the larger ones with 10 or 11 pairs of pinnules, basiscopic, the inferior basal pinnules petiolate, deltoid-lanceolate from a cordate base, about 5 cm. long and 2.5 cm. broad at the base, with about 7 pairs of ovate to ovate-oblong acute segments, the basal ones trilobate, the margins a little thickened, obscurely denticulate-sinuate; upper pinnae narrower, oblong-lanceolate, finally adnate and confluent at the acuminate apex; leaf-tissue herbaceous, dull dark-greenish above, a little paler below, minutely and scantily glandular upon both surfaces, glabrous above, nearly so below; veins elevated on both surfaces, slender. Sterile fronds similar but smaller, the pinnae (from description) narrower, ovate-lanceolate; pinnules of the lower pinnae (or at least of the lowermost) anadromous, of the upper ones catadromous.

TYPE LOCALITY: Serra dos Orgaos au Morro Queimado, Chemin dos Macacos, Brazil.
DISTRIBUTION: Costa Rica or Veragua, Panama; also in Brazil.
ILLUSTRATION: Fée, *loc. cit. pl. 78, f. 2.*

14. **Anemia anthriscifolia** Schrad. Gött. Gel. Anz. **1824**: 865. 1824.

Rhizomes slender or stoutish, horizontally creeping, sometimes rather widely so; fronds usually several, close, the stipe of the fertile fronds scarcely exceeding the sterile fronds. Fertile fronds 15–57 cm. long; stipes 5–40 cm. long, stoutish, dull- or yellowish-stramineous from a darker base, straight or subflexuous, deciduously pilose; sterile lamina ovate-deltoid, 5–15 cm. long and broad, acute, bipinnate, nearly tripinnate at the base, the rachis similar to the stipe, the secondary rachises densely clothed with long subpersistent ferruginous hairs; pinnae 6–11 pairs, mostly contiguous or overlapping, rarely apart, spreading, the lower and middle ones petiolate, ovate to oblong-lanceolate from a subcordate base, subacute, the lowermost with 6–10 pairs of distant pinnules, the basal of these

petiolate, obliquely pinnatifid close to the costa into about 5–7 pairs of acute serrate or pinnately incised segments; succeeding pinnules sessile to narrowly or broadly adnate, finally confluent, lanceolate, acute, all sharply and obliquely pinnatisect; upper pinnae gradually simpler, sessile, only the uppermost adnate, the divisions all oblique; leaf-tissue herbaceous, bright lustrous green above, paler below, pilose and glandular upon both surfaces, conspicuously so below; margins thickened, usually revolute or recurved; veins evident upon both surfaces; fertile pinnae stout, rigidly erect, 8–20 cm. long, surpassing the sterile lamina, often greatly so, short-stalked, the branches elongate; spores striate, smooth or minutely echinulate, the angles not produced. Sterile fronds 10–30 cm. long; lamina usually as long as the stipe, ovate or ovate-deltoid, or subpentagonal by the basiscopic development of the basal pinnae; pinnules mostly anadromous, only those of the upper pinnae catadromous.

TYPE LOCALITY: Brazil.
DISTRIBUTION: Widely distributed in Mexico; also in Brazil, Paraguay, and Peru.
ILLUSTRATIONS: Ettingsh. Farnkr. *pl. 172, f. 6; pl. 173, f. 2* (as *A. fulva*).

15. **Anemia guatemalensis** Maxon, sp. nov.

Rhizome wanting; stipes of the fertile fronds mostly longer than the detached sterile fronds. Fertile fronds 30–45 cm. long; stipe stout, 23–30 cm. long, erect, yellowish, very densely clothed with subpersistent spreading dark-rusty hairs; sterile lamina deltoid, 12–16 cm. long, 10–12 cm. broad, acute, tripinnate below, deeply tripinnatifid nearly throughout, the rachis conspicuously ferruginous-pilose; pinnae about 10 pairs, spreading or ascending, contiguous or imbricate, short-petiolate, mostly ovate-lanceolate or the lowermost narrowly deltoid-ovate, these the largest, 6.5–7.5 cm. long, 2.5–3 cm. broad near the base, with 8 or 9 pairs of oblong-lanceolate pinnules below the short subacute crenately lobed apex, the larger of these pinnate at the base, above deeply pinnatifid with about 4 pairs of segments, the basal ones crenately lobed; upper pinnae gradually simpler, the pinnules short-stalked or sessile, only those of the uppermost pinnae finally adnate; leaf-tissue rigidly chartaceo-membranous, thickish but translucent, dull-green above, lighter or yellowish-green below, obscurely glandular above, conspicuously so below, the upper surface glabrate, the lower conspicuously rusty-pilose along the secondary rachis, costae and veins; veins concealed or somewhat impressed above, scarcely evident below; margins slightly thickened; fertile pinnae stout, erect, 13–15 cm. long, nearly or quite as long as the sterile lamina, the stalk very short (2–2.5 cm. long), the panicle with numerous strict erect branches, the lowermost of these up to 4.5 cm. long with short pinnate divisions, the upper branches gradually shorter and closer, the uppermost densely crowded; spores striate, the angles not produced. Sterile fronds 16–33 cm. long; stipe 8–9 cm. long; lamina 10–18 cm. long, 9–15 cm. broad, ovate-deltoid or subpentagonal, the basal pinnae strongly basiscopic, spreading, unequally deltoid, the inferior basal pinnules oblong-ovate, in the largest specimen 3.8 cm. long and 1.9 cm. broad, with about 5 pairs of ovate-oblong pinnatifid or lobed segments below the trilobate apex, the lowermost sessile; pinnules mostly anadromous, only those of the upper third of the lamina catadromous.

Type collected at Cerro Gordo, Department of Santa Rosa, Guatemala, altitude about 1050 meters, August, 1892, *Heyde & Lux*, distributed by Captain John Donnell Smith under *no. 4095* (U. S. Nat. Herb. *no. 830301*).
DISTRIBUTION: Known only fron Guatemala.

16. **Anemia Rosei** Maxon, sp. nov.

Rhizomes decumbent, stoutish, closely clustered; fronds fasciculate, the stipes of the fertile fronds usually equaling or surpassing the sterile fronds. Fertile fronds 36–42 cm. long, weakly ascending; stipes rather slender, 19–26 cm. long, light-stramineous, arcuate or subflexuous, sparingly clothed with delicate very slender spreading fulvous hairs, these readily deciduous; sterile lamina deltoid-ovate, 14–16 cm. long, 9–12 cm. broad, acuminate, bipinnate or, as to the basal pinnae, nearly tripinnate, the rachis similar to the stipe, long-pilose; pinnae about 10–13 pairs, contiguous or the lower ones apart, these and the middle ones petiolate from a cordate base, broadly oblong-lanceolate, obtusish, slightly oblique, with 6–8 pairs of sessile or semiadnate deltoid-ovate, ovate or ovate-oblong oblique obtuse

segments, the larger of these deeply and obliquely pinnatifid half way or nearly to the mid-vein into 2 or 3 pairs of broad unequally rounded lobes; upper pinnae gradually smaller and simpler, finally adnate, confluent at the crenate apex; leaf-tissue membrano-coriaceous, light-green, lighter below, glandular upon both surfaces, inconspicuously fibrillose-hirsute, mainly along the veins of the lower surface; margins slightly thickened, a little recurved; veins slightly elevated upon both surfaces; fertile pinnae ascending or somewhat divergent, stout, 6–11 cm. long, about one half the length of the sterile lamina, the stalk 3–3.5 cm. long, the panicle stoutish, with mostly short close divisions, the lower ones somewhat apart; spores immature. Sterile fronds 23–38 cm. long; stipe 10–21 cm. long; lamina 13–18 cm. long, 9–12 cm. broad, ovate, deltoid or subpentagonal by the basiscopic development of the lowermost pinnae, these ascending, unequally elongate-deltoid, with the inferior basal pinnules deltoid-oblong, 2–3.3 cm. long, 8–11 mm. broad; pinnules of the basal pinnae anadromous, of the other pinnae catadromous.

Type collected in shade of rocks, Sierra de San Esteban, State of Jalisco, Mexico, altitude about 1500 meters, December 6, 1902, *Pringle 11254* (U. S. Nat. Herb. *no. 460628*).

DISTRIBUTION: Known only from the State of Jalisco, Mexico.

17. **Anemia Karwinskyana** (Presl) Prantl, Schiz. 99. 1881.

Anemia villosa Karwinskyana Presl, Abh. Böhm. Ges. Wiss. V. 4: 343. 1845.

Rhizome stout, decumbent or ascending; fronds closely fasciculate, the stipes of the fertile fronds barely surpassing the sterile fronds. Fertile fronds 32–38 cm. long; stipe 19–28 cm. long, erect, stout, flattish, light brownish-stramineous, clothed rather thickly with long subpersistent irregularly spreading brown hairs; sterile lamina deltoid, 10–11 cm. long, about 9 cm. broad, acutish, bipinnate, the rachis similar to the stipe; pinnae about 9 pairs, contiguous, the lowermost and middle ones short-petiolate from a cordate base, ovate-oblong, obtusish, with about 5 or 6 pairs of mostly semiadnate rhombic-orbicular to oblong-ovate segments, these contiguous or half their width apart, obtusish, mostly 3-lobed, the larger ones crenately pinnatifid into 5–7 lobes; upper pinnae gradually shorter and simpler, the uppermost adnate, confluent; leaf-tissue subcoriaceous, dull-greenish, scarcely lighter below, noticeably glandular upon both surfaces, laxly fibrillose-hirsute, conspicuously so over the whole lower surface; margins thickened, slightly revolute; veins elevated above, subimmersed below; fertile pinnae strict, erect, 12–14 cm. long, exceeding the sterile lamina, the stalk 2–3.5 cm. long, the panicle with numerous strict ascending divisions, the lowermost of these 2.5–3.5 cm. long; spores broadly striate, the angles not produced. Sterile fronds 24–27 cm. long; stipe 12–13 cm. long; lamina ovate-deltoid, 14–15.5 cm. long, 10–11.5 cm. broad; pinnae 9–11 pairs, approximate or the lowermost apart, these unequally deltoid-ovate, strongly basiscopic, the inferior basal pinnule about 2.3 cm. long with about 9 blunt triangular-ovate lobes, the superior basal pinnule trilobate; middle and upper pinnae as on the fertile frond; pinnules of the basal pinnae anadromous, of the other pinnae catadromous.

TYPE LOCALITY: Cristo, Mexico.

DISTRIBUTION: Known only from Mexico.

18. **Anemia Wrightii** Baker, in Hook. & Baker, Syn. Fil. 435. 1868.

Ornithopteris Wrightii Millsp. Field Col. Mus. Bot. 3: 14 (excl. description). 1903.

Rhizome short-creeping, densely clothed with minute brownish hairs; fronds dimorphous, obscurely distichous, closely fasciculate, the stipe of the fertile fronds far exceeding the sterile fronds. Sterile fronds 5–11 cm. long, laxly ascending; stipes slender, stramineous from a darker base, 3–7 cm. long; lamina narrowly ovate or somewhat deltoid, 3–6 cm. long, 2–3 cm. broad, bipinnate at the base; pinnae 3 or 4 pairs, remote, decreasing gradually toward the apex of the lamina, the upper ones narrowly cuneate, strongly ascending and confluent at the acutish apex, the middle and lower ones short-petiolate and slightly ascending; basal pinnae ovate from an unequally cuneate base, with 1 or 2 pairs of subsessile narrowly obovate long-cuneate segments, these inciso-dentate at the apex; veins elevated on both surfaces; leaf-tissue firmly membranous, opaque upon both surfaces, paler and sparsely glandular below, very sparingly pilose both above and below between the

veins. Fertile fronds 15–25 cm. long, the lamina one-third to one-sixth as long as the slender subflexuous stramineous stipe; pinnae alternate, remote, petiolate, the lowermost 5–15 mm. long; pinnules short and close, with few pilose segments; spores reticulate-striate.

TYPE LOCALITY: Eastern Cuba.
DISTRIBUTION: Confined to Cuba. The Yucatan plant referred to this species is *A. cicutaria*.

19. **Anemia cicutaria** Kunze; Spreng. Syst. Veg. 4: 31. 1827; Linnaea 9: 22. 1834.

Mohria intermedia J. Smith, Lond. Jour. Bot. 2: 387. 1843.
Coptophyllum cicutarium Klotzsch, Linnaea 18: 527. 1844.
Ornithopteris cicutaria Underw. Mem. Torrey Club 12: 15. 1902.
Anemia bipinnata Moore, Index Fil. cxvi. 1857. Not *A. bipinnata* Sw. 1806.

Rhizome short-creeping, densely clothed with short dark-brown hairs; fronds dimorphous, dorsal, obscurely distichous, closely fasciculate, the stipes of the fertile ones easily surpassing the sterile fronds. Sterile fronds 6–15 cm. long, ascending or spreading; stipes filiform, 6–8.5 cm. long, flexuous or arcuate, stramineous; lamina deltoid to deltoid-ovate, 3–8.5 cm. long, 2.5–7 cm. broad, bipinnate, or, as to the lower pinnae, deeply tripinnatifid; pinnae 3–7 pairs, alternate, contiguous or mostly apart, ascending (or the lowermost spreading), the middle and lower ones petiolate, subequilateral, deltoid to deltoid-ovate, obtuse, those above rhombic-ovate to oblong, finally confluent at the short obtuse apex; pinnules of the basal pinnae 2–5 pairs, short-stalked or sessile, rhombic-ovate to rhombic-oblong, unequally cuneate, the larger ones deeply pinnatifid into 1–3 (4) pairs of oblique cuneate segments, these inciso-dentate at the obtuse apex; pinnules and segments anadromous; veins slightly elevated upon both surfaces; leaf-tissue firmly membranous, opaque, slightly paler below, sparsely pilose upon both surfaces, copiously glandular below, sparingly so above. Fertile fronds 5–14 cm. long, the panicle one-third to nearly one-half as long as the slender stramineous or brownish-stramineous stipe; pinnae distant, alternate, the lowermost up to 5 cm. long, long-stalked, the pinnules short, sessile, with marginate segments; spores reticulate-striate.

TYPE LOCALITY: In crevices of rocks, along shaded river near the Embarcadero del Canimar, Cuba.
DISTRIBUTION: Cuba; islands of Abaco, Andros, and New Providence, Bahamas; Yucatan.
ILLUSTRATIONS: Kunze, Anal. Pterid. *pl. 5, f. 2;* Field Columb. Mus. Publ. Bot. 3: 13. *f.;* 14. *f.* (the last as *Ornithopteris Wrightii*).

20. **Anemia portoricensis** Maxon, sp. nov.

Rhizome creeping, densely covered with dark-brown or blackish turgid acicular hairs; fronds dimorphous, dorsal, distichous, clustered, the fertile ones equaling or surpassing the sterile. Sterile fronds recurved or ascending, 8–21 cm. long; stipes flexuous, 6–12 cm. long, slender or stoutish, clothed with stiff ascending or appressed brownish acicular hairs; lamina oblong-deltoid, oblong or deltoid-oblong, obtuse, 7–12 cm. long, 3–6 cm. broad in the lower part, bipinnate at the base, bipinnatifid above; pinnae spreading, approximate to imbricate, mostly short-stalked, only the upper ones subsessile, the lowermost unequally rounded-deltoid to deltoid-oblong, with 1 or rarely 2 pairs of mainly suborbicular short-stalked or sessile segments below the obtuse cuneate-lobate terminal segment; middle pinnae similar, often only deeply lobed, or with a free basal segment at the upper side, rounded exciso-cuneate at the lower; upper pinnae rhombic-ovate, cuneate at the base below, the uppermost suborbicular to obovate, finally subconfluent and commonly forming an unequal cuneate lightly lobate terminal segment; veins elevated below, immersed but apparent above; margins greatly thickened, cartilaginous, subentire or lightly sinuate-dentate, slightly revolute, the pinnules by contraction often strongly concave; leaf-tissue rigidly coriaceous, lustrous and minutely glandular upon both surfaces, sparsely long-pilose below with curved antrorse yellowish-white subpersistent hairs. Fertile fronds slender but erect, subflexuous, 10–22 cm. long; stipe slender, light-brown; lamina linear-oblong, usually about one-third or one-half as long as the stipe; pinnae subopposite or alternate, all but the uppermost distant, short-stalked, the lowermost up to 1.5 cm. long; pinnules conspicuously glandular-pilose, subflabellate; spores broadly striate, the ridges subflexuous and uneven.

Type collected on limestone cliffs, on the road from Utuado to Arecibo, Porto Rico, July 13, 1901, *Underwood & Griggs 802* (U. S. Nat. Herb. *no. 405735*).

DISTRIBUTION: Confined to Porto Rico; upon limestone cliffs and partially shaded or open rocky slopes.

21. **Anemia aurita** Sw. Syn. Fil. 157. 1806.

Osmunda aurita Sw. Prodr. 127. 1788.
Mohria aurita J. Smith, Lond. Jour. Bot. 2: 388. 1843.

Rhizome creeping, densely clothed with turgid acicular blackish hairs; fronds dimorphous, dorsal, distichous, the fertile ones equaling or often surpassing the sterile. Sterile fronds ascending or arching, 15–35 cm. long; stipe arcuate or flexuous, 8–15 or rarely 19 cm. long, light- or dark-brown, stoutish, clothed at the base like the rhizome, above with spreading or antrorse yellowish or brownish filiform hairs; lamina narrowly deltoid to oblong-deltoid, rarely oblong, 10–17 cm. long, 5–11 cm. broad at the base, bipinnate below, simply pinnate toward the apex, the uppermost segments more or less confluent at the obtuse or subacute apex; pinnae spreading, approximate, the lower and middle ones distinctly stalked, ovate-deltoid to rhombic-ovate, truncate at the upper base and close to the rachis, cuneate below; lowermost pinnae fully pinnate at the base, with 1–4 pairs of ovate, orbicular, or obovate segments below the obtuse lobate apex, the basal ones stalked and rarely rhombic-ovate to deltoid; middle pinnae gradually simpler, the uppermost rhombic-oblong to rhombic-ovate, exciso-cuneate at the base below; veins elevated below, subimmersed but evident above; margins strongly and sharply inciso-denticulate, thickened, flattish or slightly revolute; leaf-tissue rigidly coriaceous, bright lustrous green and very minutely glandular upon both surfaces, glabrate below. Fertile fronds 25–45 cm. long; stipe stoutish, strict or a little flexuous above; fertile lamina one-third or one-half as long as the stipe; pinnae alternate, spaced, ascending, the lower ones up to 6 cm. long, long-stalked, those above gradually shorter; pinnules pilose, glandular, spaced, the segments subflabellate; spores broadly striate, the ridges subflexuous and undulate.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Confined to Jamaica, mainly in the central and western parts of the island, on rocky partially shaded slopes, at 600 meters elevation or less.

ILLUSTRATION: Hook. Ic. Pl. *pl. 903*.

22. **Anemia mexicana** Klotzsch, Linnaea 18: 526. 1844.

Ornithopteris mexicana Underw. Our Nat. Ferns ed. 6. 76. 1900.

Rhizome creeping, thickly clothed with acicular turgid blackish or dark-brown hairs; fronds several, dorsal, distichous, close, the stipes of the fertile fronds not equaling the sterile fronds. Fertile fronds 25–50 cm. long; stipe 13–28 cm. long, slender or usually stoutish, dull-stramineous from a darker base, canaliculate along the ventral face, often angled in drying, at first dark-fibrillose near the base, glabrate above; sterile lamina deltoid-ovate, usually very broadly so, 7–23 cm. long, 7–20 cm. broad, acute, once-pinnate, the rachis stramineous, canaliculate along the ventral face, glabrate or with a few blackish acicular hairs at the side; pinnae 3–7 pairs, contiguous or half their width apart, spreading, the lowermost the largest, petiolate, lanceolate-oblong to ovate-lanceolate, acute or attenuate, subcordate-truncate at the base, or the lower side exciso-cuneate; middle pinnae similar, gradually smaller, subequilateral at the base, the upper ones free, sessile, or the uppermost on either side confluent with the terminal segment, this usually larger than the pinna below, inequilateral, cuneate, subcordate or sometimes unequally hastate; leaf-tissue rigidly membrano-chartaceous, dull-green and glabrous above, paler and minutely glandular below; costae nearly medial, conspicuously elevated, stramineous; veins very oblique, repeatedly dichotomous, very close, distinctly elevated upon both surfaces, fibrillose-hirtous below or often nearly glabrous; margins thickened, sharply and unevenly serrulate-denticulate; fertile pinnae 9–30 cm. long, invariably surpassing the sterile lamina, often greatly so, the panicle as long as the stalk or longer, flattish or the divisions somewhat involute, short, the lower and middle ones petiolate, remote, the upper ones simpler, shorter, densely crowded; spores closely cristate-striate, the ridges somewhat flexuous. Sterile fronds shorter, 13–45 cm. long, the stipe and lamina about equal; lamina 13–25 cm. long, 11–18 cm. broad, deltoid-ovate to oblong-ovate, otherwise as in the fertile frond; pinnae 4–7 pairs.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Western Texas, southward to the states of Tamaulipas, Coahuila, Nuevo Leon and Morelos, Mexico.
ILLUSTRATIONS: Hook. Ic. Pl. *pl. 988;* Kunze, Farrnkr. 2: *pl. 131.*

23. **Anemia speciosa** Presl, Abh. Böhm. Ges. Wiss. V. 4: 349. 1845.

Anemia mexicana paucifolia Hook. Second Cent. Ferns *pl. 65.* 1861.

Rhizome creeping, thickly clothed with long turgid mainly light- or yellowish-brown hairs; fronds several, dorsal, distichous, loosely fasciculate, the stipes of the fertile fronds not equaling the sterile fronds. Fertile fronds 10–50 cm. long, rigidly erect; stipe up to 30 cm. long, usually longer than the sterile lamina, mostly stoutish, dull-stramineous or light-brownish from a darker base, nearly terete or lightly canaliculate above, at first noticeably dark-fibrillose especially toward the base, glabrescent; sterile lamina broadly deltoid-ovate, up to 18 cm. long and 15 cm. broad, long-acuminate, once-pinnate, the rachis similar to the stipe, sulcate, deciduously fibrillose; pinnae 1–4 pairs, approximate or the lower ones slightly apart, spreading or somewhat ascending, equilateral or nearly so, petiolate, the 2 lower pairs about equal, oblong-lanceolate from an obtusely cuneate or rounded-truncate base, in large specimens 6.5–9.5 cm. long and 2–2.5 cm. broad, tapering gradually from near the middle to a long acute apex; upper pinnae smaller and relatively broader, narrowly ovate-lanceolate, the terminal pinna similar but usually much larger (maximum 9–11.5 cm. long), deltoid-lanceolate, the apex greatly produced; leaf-tissue rigidly coriaceous, thick, bright lustrous green above, paler and very sparingly glandular below, glabrous upon both surfaces; veins oblique, repeatedly dichotomous, somewhat apart except toward the margin, distinctly impressed upon the upper surface, elevated below, glabrous; margins cartilaginous, usually serrulate, the teeth stoutish, appressed or commonly hamate; fertile pinnae up to 15 cm. long, usually much shorter, never equaling the sterile lamina, borne 1.5–3 cm. below, ascending, the panicle about twice as long as the slender stalk, flattish, lanceolate in outline, the divisions mostly close, oblique, the lower and middle ones distinctly stalked; spores widely and sharply striate. Sterile fronds considerably smaller, otherwise similar.

TYPE LOCALITY: Western Mexico.
DISTRIBUTION: Southern and western Mexico to the Departments of Petén and Alta Verapaz, Guatemala; Cuba (rare).
ILLUSTRATION: Hook. *loc. cit.* (small specimens).

24. **Anemia cuneata** Kunze; Spreng. Syst. Veg. 4: 32. 1827; Linnaea 9: 21. 1834.

Rhizome rather freely creeping, densely clothed with turgid acicular dark-brown hairs; fronds several, dorsal, manifestly distichous, spaced, the stipes of the fertile fronds not equaling the sterile fronds. Sterile fronds 8–31 cm. long, rigidly ascending; stipes slender, up to 12 cm. long, shorter than the lamina, stramineous from a castaneous base, glabrous; lamina up to 19 cm. long, usually much smaller, narrowly ovate-lanceolate in outline, attenuate, bipinnate or, as to the lower pinnae, tripinnate; pinnae 4–8 pairs, alternate, distant, strongly ascending, decreasing gradually from the base of the lamina toward the apex; lower and middle pinnae petiolate, lanceolate in outline, acute or attenuate, with 3–5 pairs of very oblique alternate narrow pinnules, of these the upper basal one largest, pinnate at the base and comprising 3–5 alternate slender long-cuneate narrowly oblanceolate or nearly linear segments, these strongly fimbriate or inciso-dentate at the apex; upper pinnae gradually simpler, at least bipinnate, only the uppermost simple, finally confluent at the slender serrate apex; pinnules and segments anadromous; veins evident above, scarcely so below; leaf-tissue rigidly herbaceous, slightly lustrous, paler and glandular below, and with a very few scattering stiff hairs between the veins upon both surfaces. Fertile fronds more rigidly erect, up to 30 cm. long; stipe as long as the lamina or commonly twice as long; sterile lamina similar to that of the sterile frond; fertile (basal) pinnae remote, long-petiolate, elongate but not equaling the sterile lamina, the divisions short and remote, the lower ones stalked, with several pairs of close simple or forked segments; spores flexuose-striate, the ridges slightly undulate.

TYPE LOCALITY: Shaded rocky banks of streams, near Santa Ana-Cavalleros, Cuba.
DISTRIBUTION: Known only from Cuba.
ILLUSTRATIONS: Kunze, Anal. Pterid. *pl. 8, f. 1;* E. & P. Nat. Pfl. 1⁴: 370. *f. 198, C.*

25. **Anemia coriacea** Griseb. Cat. Pl. Cuba 272. 1866.

Rhizome relatively slender and wide-creeping, freely branched, densely clothed with slender brown turgid hairs; fronds dorsal, manifestly distichous, spaced or subfasciculate, the stipes of the fertile fronds mostly surpassing the sterile fronds, usually much so. Sterile fronds 5–9 cm. long, rigidly ascending; stipes stoutish, 2.5–5 cm. long, dark-brown, smooth, or at the arcuate base pilose; lamina deltoid or ovate-deltoid, 2.5–5 cm. long, 2–4 cm. broad, acute, bipinnatifid or sometimes bipinnate at the base; pinnae 4–6 pairs, approximate, slightly ascending, alternate, the lowermost petiolate, hastate, obtusely cuneate at the base below, truncate above, and broadly subauriculate both above and below, or in larger fronds elongate, lanceolate-deltoid, with a single pair of ovate or suborbicular pinnules at the base and crenately lobed below the obtuse apex; middle pinnae short-petiolate to sessile, unequally hastate to deltoid-oblong, the uppermost ovate-oblong, semiadnate, finally confluent at the acute subentire apex; veins prominent upon both surfaces; leaf-tissue very coriaceous, lustrous upon both surfaces, paler below, glandular and very sparsely pilose upon both surfaces; margins denticulate, thickened, rigidly recurved, the segments often concave. Fertile fronds 14–24 cm. long, erect; stipes elongate, 8–15 cm. long; sterile lamina similar to that of the sterile frond but narrower and smaller; fertile (basal) pinnae alternate, long-petiolate, 6–9.5 cm. long, 2 to 3 times as long as the sterile lamina, the pinnules alternate, remote, bipinnatifid, with distinct and nearly glabrous segments; spores cristate-striate, the ridges undulate.

TYPE LOCALITY: Cuba.
DISTRIBUTION: Known only from eastern Cuba.

26. **Anemia adiantifolia** (L.) Sw. Syn. Fil. 157. 1806.

Osmunda adiantifolia L. Sp. Pl. 1065. 1753.
Osmunda asplenifolia Savigny, in Lam. Encyc. 4: 652. 1797.
Ornithopteris adiantifolia Bernh. Neues Jour. Bot. Schrad. 1²: 50. 1806.
Anemia asplenifolia Sw. Syn. Fil. 157. 1806.
Anemia carvifolia Presl, Rel. Haenk. 1: 74. 1825.
Anemia adiantifolia asplenifolia Hook. & Grev. Ic. Fil. 1: *pl. 16.* 1829.

Rhizome creeping, closely clothed with dark-brown or blackish acicular turgid hairs; fronds dorsal, distichous, approximate, the stipe of the fertile ones usually not equaling the sterile fronds. Sterile fronds ascending or arching, 15–70 cm. long; stipe usually a little longer than the lamina, brownish-stramineous from a darker base or rarely castaneous throughout, clothed with dark to lightish flaccid hairs, glabrescent except near the base; lamina ovate-deltoid or subpentagonal, 7–35 cm. long, 4–28 cm. broad at the base, bi-tripinnate, or in large forms deeply quadripinnatifid at the base, gradually simpler above, the upper pinnae closer, sessile, very gradually reduced, the uppermost adnate, finally confluent at the elongate acuminate apex; pinnae numerous, contiguous or imbricate, slightly ascending, all but the upper ones distinctly stalked, in outline truncate above at the base and usually contiguous with the rachis, exciso-cuneate below, the pinnules wholly anadromous; lowermost pinnae the largest, deltoid-lanceolate, often elongate, inequilateral by the development of the inferior basal pinnules, these deltoid-lanceolate or ovate-lanceolate from a broad base, acute, fully pinnate (segments 1–6 pairs, the basal ones often deeply pinnatifid), the anterior pinnules approximate or contiguous, exciso-cuneate below, inequilateral, ovate-lanceolate to ovate-oblong or narrowly subrhombic, all but the outermost deeply pinnatifid or incised, these oblong-obovate (often narrowly so), obtuse, the ultimate segments of the lamina in general similar to these, wholly anadromous; rachises long-pubescent throughout with slender mostly whitish hairs; leaf-tissue usually coriaceous, lustrous upon both surfaces, paler and glandular below, pilose upon both surfaces, especially between the veins, finally glabrescent above; margins erose-denticulate, thickened. Fertile fronds mostly 15–85 cm. long, the lamina about one half to one fourth the length of the frond, similar to that of the sterile frond or usually not pentagonal; fertile (basal)

pinnae erect, remote, usually shorter than the sterile lamina, sometimes exceeding it a little; panicle usually as long as the stalk, sometimes 2–4 times as long, the divisions either laxly disposed or compact; spores cristate, the ridges flexuous and undulate.

TYPE LOCALITY: Near Petit Goâve, Haïti.

DISTRIBUTION: Peninsular Florida, the Bahamas, and the West Indies generally to Trinidad; less common in Mexico and Guatemala; known also from a single locality in Brazil and one in Colombia.

ILLUSTRATIONS: Plumier, Traité Foug. *pl. 158*; Bernh. *loc. cit. pl. 3, f. 15a*; Hook. & Grev. *loc. cit.*; Lowe, Nat. Hist. New & Rare Ferns *pl. 32*; Denks. Akad. Wiss. Wien **23**: *pl. 18, f. 9*; Ettingsh. Farnkr. *pl. 172, f. 11, pl. 173, f. 8*; D. C. Eaton, Ferns N. Am. *pl. 15*.

DOUBTFUL OR EXTRALIMITAL SPECIES

Anemia cornea Prantl, Schiz. 104. 1881. Described from specimens collected near Trapiche de la Concepcion, Oaxaca, Mexico, altitude about 900 meters, *Liebmann*. Presumably a valid species, resembling *A. humilis* but distinct in spore characters. Only a small frond of the original collection has been seen by the writer. Known only from the type collection.

Anemia distans Fée, Mém. Foug. 9: 41 (33). 1857. Founded upon specimens from Talea, Mexico, *Galeotti 6567bis*. Unidentified; the description very incomplete.

Anemia elegans (Gardn.) Presl, Abh. Böhm. Ges. Wiss. V. 4: 341. 1845. (*Trochopteris elegans* Gardn. Lond. Jour. Bot. 1: 74. *pl. 4*. 1842.) Apparently confined to Brazil, the type being from the Serra de Natividad, province of Goyaz, *Gardner 4085*. By confusion of collectors' numbers erroneously ascribed to Cuba; see Prantl, Schiz. 90. 1881.

Anemia filiformis (Savigny) Sw. Syn. Fil. 156. 1806. (*Osmunda filiformis* Savigny, in Lam. Encyc. 4: 652. 1797. *Anemia repens minor* Raddi, Pl. Bras. 1: 71. *pl. 9, f. 2a*. 1825.) Type from South America, and only South American specimens are cited by Prantl. Cited from Jamaica by Jenman, probably in error, and from Mexico by Presl on the basis of specimens collected near Tlacolula by Ehrenberg. Not seen by the writer and not cited from North America by Prantl.

Anemia helveola Fée, Mém. Foug. 9: 41 (32). 1857. Founded upon specimens from Villa Alta, Oaxaca, Mexico, *Galeotti 6585bis*. Unidentified; the description meager.

Anemia laciniata Link, Fil. Sp. 25. 1841. Described from cultivated specimens; regarded by Prantl (*loc. cit.* 121) as a hybrid, *A. ciliata* × *Phyllitidis*. Further synonymy is given by Prantl, who cites specimens also from Venezuela and Mexico. Not known to the writer from specimens.

Anemia mandioccana Raddi, Opusc. Sci. Bol. 3: 282. 1819. A strictly Brazilian species, ascribed to Jamaica by Grisebach; on this account included by Jenman in his treatment of the Jamaican species, his description drawn from Brazilian specimens.

Anemia Munchii Christ, Bull. Herb. Boiss. II. 7: 792. 1907. Founded upon specimens from San Cristobal, Chiapas, Mexico, *Munch 30*. Not seen by the writer; from the description apparently a small abnormal form of *A. Phyllitidis*.

Anemia Presliana Prantl, Schiz. 104. 1881. Apparently confined to Brazil. The Guatemalan and Colombian plants so referred by Hieronymus (Bot. Jahrb. 34: 565. 1905) are *A. humilis*, as here understood.

Anemia repens Raddi, Opusc. Sci. Bol. 3: 282. 1819; Raddi, Pl. Bras. 1: 71. *pl. 9. f. 2b* (β major, not a). 1825. (*Anemia ciliata* Presl, Del. Prag. 1: 158. 1822.) Ascribed to Mexico, Honduras, Panama, and Santo Domingo by Prantl. Material within this range examined by the writer is referable to *A. hirsuta*, from which *A. repens* is perhaps not separable specifically. The type is from Brazil.