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ovate-l, simply pinnate or bipinnate below; pinnules and upper pinnae 1-2′ long, ¾′ broad or less, nearly sessile, smooth; indusium formed of slightly altered incurved edge of pinnules. Vt; Tex; Ar. Synonyms: Allosorus atropurpureus Kunze.—Pteris atropurpurea L.—Platyloma atropurpurea J. Smith.

F. ASPERA Baker.

Stipes slender, 2-3′ long, bk with scurfy pubescence; fronds 4-6′ long, oblong-lanceolate, bipinnate: pinnae and pinnules deltoid-lanceolate or oblg, pinnules next to main rachis often lobed; all of them rough on both surfaces with short harsh hairs. Tex; NM. Synonym: Cheilanthes aspera Hooker.

II.—Fronds 2-4-pinnate, ultimate segs oval or cordate.

PELLAEA ANDROMEDAEFOLIA Fee.

Stipes scattered, erect, pale brown, 2-12′ long; fronds 6-12′ long, 3-6′ broad, ovate, 2-4-pinnate, 3-p; com pinnae rather distant, spreading; ultimate pinnules 2-5″ long, oval slightly cordate coriaceous, margin of fertile ones sometimes revolute to midrib; veins num, parallel. Synonyms: Allosorus andromaefolius Kaulf. —Pteris andromedaefolia Kaulf, Enum Fil 188 (1824).

Arizona; southern and Baja California.

F. PULCHELLA Fee, Gen Fil 129 (1850-2).

Stipes densely tufted, 3-6′ long, chaffy at base, nearly bk; fronds 3-9′ long, 1-5′ broad, triangular-ovate, 4-pinnate below, gradually simpler above; lower pinnae deltoid, narrowly triangular above; ultimate pinnules num, 1-3″ long, oval or often cordate-ovate, stalked, coriaceous, smooth, edges often much reflexed. Tex; NM. Synonym: Allosorus pulchellus Mart & Gal, mem ac Brux, 15 (5):47 (1842).

III.—Fronds 3-4-pinntifid; segs linear-oblg: secondary rachises margined.

F. MARGINATA Baker.

Stipes tufted, 3-9′ long, castaneous, shining, slightly fibrillose at base; fronds 4-6′ long, nearly as broad, deltoid; lower pinnae much the largest; indusium broad, continuous, margins slightly erose; texture chartaceous. Huachuca mts. Ar (Lemmon). Synonym: Cheilanthes marginata Hooker.

**Pinnules mucronulate or decidedly acute.

I.—Fronds narrowly linear in outline, com bipinnate.

F. TERNIFOLIA Link.

Stipes tufted, nearly or quite bk, 2-6′ long, fronds 4-10′ long, narrowly linear; pinnae com 9-15 pairs, all but uppermost trifoliate; segs com linear, slightly mucronate, coriaceous, sessile or middle one indistinctly stalked, edges much inflexed in fertile fronds; indusium broad. Tex. Synonym: Pteris ternifolia Cav.

F. BRACHYPTERA Baker.

Stipes 2-8′ long stout, p'ish-brown; fronds 3-8′ long, narrow in outline from the ascending secondary rachises, bipinnate; pinnules crowded, 2-5″ long, oblong-linear, simple or trifoliate, acute or mucronulate; margins inflexed to midrib in fertile fronds. Cal. Synonmys: P. ornithopus brachyptera D. C. Eaton.—

Platyloma bellum et P. brachypterum Moore.

II.—Fronds broader, lanceolate to ovate, 2-3-pinnate.

PELLAEA ORNITHOPUS Hook.

Stipes tufted, 3-8′ long, rather stout, dark brown: fronds very rigid, 3-12′ long, 2-3′ broad, broadly deltoid-lanceolate, 2-3-pinnate; primary pinnae spreading or obliquely ascending, linear bearing 4-16 pairs of trifoliate (varying from simple to 5-7-foliate) mucronulate pinnules, 1½-2″ long; margins inflexed to midrib in fertile fronds. Synonym: Allosorus mucronatus D. C. Eaton.

California; Baja Cal. Tea or wire fern

PELLAEA WRIGHTIANA Hook.

Rtstock short, thick, densely chaffy; stipes crowded, p ish-brown, 4-6′ long; fronds 3-6′ long, 1-3′ broad, lanceolate to deltoid, trifoliate at apex, bipinnate below; pinnae short with 1-2 pairs of long, narrow pinnules besides the terminal one; mucro short, with broad cartilaginous margin; margin of fertile fronds inflexed to midrib. Extremely variable. Colo; Tex; Cal; Kans.

Variety **LONGIMUCRONATA** Davenport.

Fronds decreasing to simply pinnate at apex, longer but less broadly winged mucro. Synonym: P. longimucronata Hooker.

Variety **COMPACTA** Davenport.

Pinnules densely crowded.

Section **PLATYLOMA** J. Smith. Texture coriaceous, veins com hidden, ultimate segs broad and flat, indusium so narrow as to be soon hidden by fr.

F. BRIDGESII Hooker.

Stipes 2-6′ long, tufted, castaneous; fronds 4-6′ lg, 1′ or more broad, simply pinnate; pinnae 5-18 pairs, mainly opp, nearly sessile, glaucous g, coriaceous, rounded or corbate at base; indusium narrow, formed of w'ish margin of pinna, soon flattened out exposing broad sorus. Cal.

F. FLEXUOSA Link.

Rtstock creeping, ratner slender: stipes r'ish, passing into a more or less flexuous or zigzag rachis; fronds 6-30′ long ,ovate-oblong, 2-3-pinnate; secondary and tertiary rachises com deflected and zigzag, rusty puberulent or nearly smooth; pinnae mostly alt; ultimate pinnules 5-10″ long, roundish-ovate or subcordate, smooth; margins at first reflexed, soon flattened out. Tex; Cal. Synonym: Allosorus flexuosus Kaulf.

F. INTERMEDIA Mett.

Rtstock long, wide-creeping, slender. chaffy; stipes scattered, 4-6′ long, pinkish-stramineous, smooth; fronds 5-10′ long, 3-8′ wide, ovate-bipinnate; pinnae nearly opp, remote; pinnules 2-6 pairs, petiolate, subcoriaceous, oval or cordate-ovate; veins obscure, rachises not pubescent. Huechuca mts, Ar (Lemmon).

Tribe **CERATOPTERIDEAE.** Sori on 2 or 3 longitudinal veins which are nearly parallel with edge of frond; aquatic

CERATOPTERIS Brong, soc Philom b 1821:184.

Characters of the tribe.

C. THALICTROIDES Brong. Soc Philom b 1821:186 t 1.

Floating fern. Southern Fla, the only

sp. Synonym: Acrostichum thalictroides L, sp Pl 1070 (1753).

Tribe **BLECHNEAE.** Sori dorsal, linear or oblong, borne on transverse veins, parallel to midrib; indusium fixed at outer, opening at inner, margin.

*Veins free. Struthiopteris; Blechnum.

**Veins more or less reticulate. Woodwardia.

STRUTHIOPTERIS Scop, Fl Com ed 1, 168 (1760).

Sori in a continuous band next midrib; indusium elongate, formed of the recurved and altered margin of pinnae, or submarginal; fronds of 2 sorts, elongate, pinnate. Nearly 50 species, mainly of south temperate zone.

S. SPICANT Weiss, Pl Crypt 287 (1770). Deer fern, Hard fern. Cal; Alk.

Synonyms: Osmunda spicant L sp Pl 1066 (1753).—Lomaria spicant Desv Mag Gesell Nat Fr Berlin 5:325 (1811).—Blechnum boreale Swz. Schrad J bot 1800 (2): 75 (1801).—Blechnum spicant J. E. Smith, Ac roy sci Turin mem 5:411 (1793).

BLECHNUM L.

Sori linear, elongate, continuous near midrib; indusium continuous; fronds pinnate. Near 20 sp.

B. SERRULATUM Richard.

Stipes 6-12′ long, stout, erect, nearly naked; fronds oblong-lanceolate, 1-1½° long, 3-6′ broad, with 12-24 pairs of distinct linear-oblong pinnae, margins finely incised; texture coriaceous; veins very fine and close, fertile pinnae narrower. Fla. Synonym: Blechnum angustifolium Willd.

Genus WOODWARDIA Smith.

Sori linear or oblong, forming chain-like rows; indusia separate. Chain fern. Six sp. Named for Thomas J. Woodward, an English botanist.

Section **EUWOODWARDIA.** Fronds uniform, veins forming at least one series of areolae between sori and margins.

. CHAMISSOI Brack, FUS Exp 138. B 2:344 as radicans.

W. RADICANS Am, mem ac Turin 5:412. B 2:344. Da 20. Baja! Greene, Cal ac b 2:415 Cruz.

. SPINULOSA Mart & Gal, Mem Ac Brux 15 (5): 64 (1842).

Caudex stout, erect, rising a little above ground; stipes stout, 8-12′ long; fronds 3-5° long, subcoriaceous, pinnate: pinnae 8-15′ long, 2-4′ broad, oblique to rachis, pinnatifid nearly to midrib; segs spinulose-serrate; veinlets forming a single row of oblong sorus-bearing areolae next midvein, besides a few oblique empty areolae outside the fr'ing ones, thence free to margin. Cal; Ar; Baja! Synonym: W. chamissoi Brock, in Wilkes' US Expl Exp 16:138 (1854).

Woodwardia radicans americana Hook, sp Fil 3:67 (1860).

Washington to Baja Cal.; Arizona.

Section **ANCHISTEA** Fronds uniform, veins free between sori and margins.

W. VIRGINICA J. E. Smith.

Stipes stout, 12-18′ long; fronds oblong-lanceolate, 12-18′ long, 6-9′ broad; pinnae linear-lanceolate, 4-6′ long, ¾-1′ broad, cut nearly to rachis into linear-oblong lobes. Can; Fla; Mich; Ark. Synonyms: W. Banisteriana Michx.—Blechnum Carolinianum Walt.—B. Virginicum L.—Doodia Virginica Presl.

Section **LORINSERIA** Presl. Fronds dimorphous, veins everywhere forming areolae.

W. ANGUSTIFOLIA J. E. Smith.

Sterile frond with slender stipes, 9-12′ long, 6-8′ broad, deltoid-ovate, with num oblong-lanceolate sinuate pinnae; rachis broadly winged; fertile frond with an elongate, castaneous st; pinnae 3-4′ long, narrowly linear. Me; Fla; Mich; Ark. Synonyms: W. onocleoides Willd.—W. areolata Moore.—Acrostichum areolatum L.

Tribe **ASPLENIEAE.** Sori dorsal, linear or oblong, oblique to midrib, or rarely parallel with it; indusium fixed by one margin to veinlet, opening at the other, sometimes double.

*Veins free. Asplenium; Athyrium; Phyllitis.

**Veins reticulate. Camptosorus.

ASPLENIUM L.

Sori on upper side of a fertile veinlet. rarely on both sides, oblong or linear, oblique, separate; indusium straight or rarely curved. Near 350 cosmopolitan sp.

Section **EUASPLENIUM.** Veins free, simple or branched; indusium straight or slightly curved, attached to upper side of a vein.

*Fronds simple.

A. SERRATUM L.

Fronds growing in a crown from a sh, stout, erect rtstock, 1½-2½° long, 2-4′ broad, simple, spatulate or linear-oblanceolate, margin crenulate or irregularly but finely serrate, subcoriaceous; midrib prominent, keeled and often bk-ish-p beneath; veins closely placed, 1-forked; sori elongate, following veins of upper ½ of frond from near midrib halfway to margin; indusia single, free edge entire. Fla.

**Fronds pinnatifid or pinnate below. tapering to a point.

A. PINNATIFIDUM Nuttall.

Stipes tufted, 2-4′ lg; fronds 3-6′ lg, 1-2½′ broad, lanceolate, pinnatifid, or pinnate below, tapering to a slender prolongation above; lobes roundish-ovate, or lowest pair acuminate; sori num. Pa; Ill; Ky; Ala.

T. EBENOIDES R. R. Scott.

Fronds 4-9′ long, broadly lanceolate. pinnatifid, pinnate below; apex prolonged and slender; divisions lanceolate from a broad base, lower ones shorter; stipes bk and polished, as is lower part of midrib, especially beneath. Ct; NY; Ill; Ala.

***Fronds once pinnate.

I.—Pinnae ¼-¾′ long, mostly blunt.

A.—Rachis chestnut brown or bk-ish.

A. EBENEUM Ait.

Stipes tufted, 3-6′ long, chestnut brown, nearly naked; fronds 8-16′ long. linear-lanceolate; pinnae 20-40, lanceolate, subfalcate, or lower oblong, ¼-1′ long, dilated base auricled on upper or both sides; sori oft 10-12 on each side. Fla; Ky; Can. Synonym: A. trichoman-

oides Michx.

A. PARVULUM Mart & Gal.

Fronds tufted, erect, rigid, 4-10′ long, narrowly linear-lanceolate; stipe and rachis bk and shining; pinnae num, oblong, obtuse, entire or crenulate, auricled on upper side, nearly sessile; middle pinnae longest, lower gradually shorter and deflexed; sori short, abundant. Va; SC; Fla; Ark; NM. Synonyms: A. ebeneum minus Hooker.—A. resiliens Kunze.

A. TRICHOMANES L.

Stipes densely tufted, p-brown, shining; fronds 3-8′ long, ½′ or more broad, linear; pinnae 15-30 pairs, nearly opp, roundish-oblong or oval, the 2 sides unequal, obliquely wedge-truncate at base, attached by a narrow point, edge slightly crenate, midvein forking and evanescent; sori 3-6 on each side of midrib. Eastern US to Pacific Coast. Synonym: A. melanocaulon Willd.

Variety **INCISUM** Moore. .. ..

Fronds larger, often ¾′ or more broad, pinnae more or less deeply incised. Vt.

A. MONANTHEMUM L.

Stipes densely tufted, 3-6′ long, chestnut brown; fronds 6-12′ long, narrow, with 20-40 pinnae on each side; pinnae crenate above, abruptly narrowed at base, oft auricled, lower much reduced; texture subcoriaceous; veins flabellate; sori 1-2. linear-oblong, parallel with lower edge of pinnae. Huachuca mts, Ar (Lemmon).

I.—AA.—Rachis g.

A. VIRIDE Huds.

Stipes densely tufted, 2-4′ long naked, lower part chestnut brown; fronds 2-6′ long, ½′ broad, with 12-20 pinnae on each side which are ovate or rhomboidal in outline, upper edge narrowed suddenly at base, lower obliquely truncate, outer part deeply crenate; raches naked; sori copious. Vt; Can; New Brunswick.

A. DENTATUM L.

Stipes tufted, 2-6′ long, naked, ebeneous below; fertile fronds 2-3′ long, 1′ broad, with 6-8 pairs of stalked, oblong-rhomboidal pinnae, lower side truncate with a curve, outer edge irregularly crenate; sterile fronds smaller on shorter stipes; rachis naked; sori copious in parallel rows. Fla; SC.

II.—Pinnae only 2-5, linear-cuneate.

A. SEPTENTRIONALE Hoffm.

Stipes densely tufted, 3-6′ long, slender, naked, ebeneous toward base; fronds irregularly forking, consisting of 2-5 narrowly linear rather rigid segs, which are entire or more frequently cleft at end into few long narrow teeth; sori elongate, near margin, com facing each other in pairs, com 2-3 to each seg. NM; Colo.

III.—Pinnae num, linear or linear-oblong acute or acuminate.

A. ANGUSTIFOLIUM Michx.

Stipes 1° or more long, brownish, slightly scaly below; fronds 1½-2° long, 4-6′ broad, lanceolate-oblong, flaccid; pinnae 20-30 pairs, linear-lanceolate, acminate, entire or crenulate, those of fertile fronds narrower; texture thinly herbaceous; sori linear, 20-40 each side of midvein. New England; Ky; Wis.

A. FIRMUM Kunze.

Stipes 4-8′ long, erect, grayish, naked; fronds ½-1° long, 3-4′ broad; pinnae 12-20 pairs, oblong-lanceolate, point bluntish, margin inciso-crenate, upper one narowed suddenly at base, lower one obliquely truncate; sori short, falling short of both midvein and margin. Fla; Ar.

****Fronds 2-3-pinnatifid. A.—Texture somewhat coriaceous.

A. RUTA-MURARIA L.

Stipes tufted, 2-4′ long, naked; fronds ovate-deltoid, 1-2′ long, 2-3-pinnate below, simply pinnate above; divisions rhombic-wedge-snaped, toothed or incised at apex; veins flabellate; sori few, elongate, soon confluent. Vt; Mich; Ky.

A. MONTANUM Willd.

Stipes tufted, 2-3′ long, naked; fronds 2-5′ long, ovate-lanceolate, pinnate; pinnae 3-7-parted below, incised or toothed above; veins obscure; sori short, basal ones sometimes double. Ct; NY; Ga; Ky; Ark.

A. GLENNIEI Baker.

Caudex erect, with dark brown, linear-setaceous scales; stipes densely tufted, ½-1′ long, castaneous; fronds 3-4′ long, oblanceolate, bipinnate; pinnae 20-25 pairs, lanceolate, lower gradually reduced, cuneate-truncate; pinnules 5-6 pairs, oblong, toothed or externally subentire; sori 1 at base of each pinnule or 2 or more on lowest anterior. Huachuca mts. Ar (Lemmon).

****AA.—Texture thinly herbaceous or membranous.

A. BRADLEYI D. C. Eaton.

Stipes tufted, 2-3′ long, ebeneous, as also lower half of rachis; basal scales brown-bl., lanceolate-acuminate; fronds 3-7′ long, oblong-lanceolate, bipinnatifid; pinnae 8-12 pairs, short-stalked or sessile, ovate-oblong, lowest not reduced, largest pinnatifid with oblong lobes toothed at tip; sori short, near midvein. NY; Tenn; Ky; Ark.

A. MYRIOPHYLLUM Presl, Rel Haenk 1:48 (1830).

Stipes tufted, 2-6′ long; fronds 3-10′ long, delicately membranous, lanceolate, narrowed below, 2-3-pinnate; ultimate segs obovate-oblong, entire or 2-3-lobed; veins single in each seg, bearing below middle a solitary oblong sorus. Fla. Synonyms: A. rhizophyllum myriophyllum Mett.—Caenopteris myriophyllum Swz Fl Ind Occ 3:1626 (1806).

A. CICUTARIUM, Swz, Prodr Veg Ind Acc 130 (1788).

Stipes tufted, 4-8′ long, g'ish, naked; fronds 6-15′ long, 4-6′ broad, with 10-15 horizontal pinnae on each side, lower ones 2-3′ long, 1′ broad, cut down to rachis into linear or oblong segs, which are once or twice cleft at apex; rachis compressed, oft winged; sori principally in 2 rows. Fla.

Section **ATHYRIUM** Roth. See Athyrium.

ATHYRIUM Roth, Tent Fl Germ 3:58 (1800).

Veins free; sori more or less curved, sometimes horseshoe-shaped, oft crossing to outer or lower side of fr'ing vein-

let. Treated as a section of Asplenium by many of the older botanists.

A. THELYPTEROIDES Desv, Mem Soc Linn Paris 6:266 (1827).

Silvery spleenwort. Stipes long, erect, stramineous; fronds 1-2° long, 6-12′ broad, bipinnatifid; pinnae linear-lanceolate; segs crowded, oblong, minutely toothed; sori 5-6 pairs to each seg, slightly curved lower ones often double. Can; Ga; Ala; Minn; Ill. Synonyms: Asplenium thelypteroides Michx, Fl Bor Am 2:265 (1803).—Asplenium acrostichoides Swz, Schrad J bot 1800 (2):54 (1801), not Athyrium acrostichoideum Bory Merat, Fl Paris ed 4, 1:372 (1836).

A. FILIX-FOEMINA Roth. Tent Fl Germ 3:65 (1800).

Lady fern: Female fern. Stipes tufted, 6-12′ long, stramineous or brownish; fronds delicate, 1½°-3′ long, broadly oblong-ovate, bipinnate; pinnae 4-8′ long, lanceolate; pinnules oblong-lanceolate, pointed, more or less pinnately incised or serrate, distinct or confluent on secondary rachises by a very narrow inconspicuous margin; sori short; indusium straight or variously curved Newfoundland to Fla; Bc; Cal; Ut; Nev; Ar; Ala. Synonyms: Polypodium filix-foemina L, sp Pl 1090 (1753).—Asplenium filix-foemina Bernh, Schrad Neuer J bot 1 (2): 26 (1806).—Aspidium filix-foemina Swz. —Nephrodium asplenoides Michx.— and near 70 varieties which have been named and described.

A. CYCLOSORUM Rupr. Beitr Pflanzenk Russ Reich 3:41 (1845).

Alk to Cal; Nebr. Based on Athyrium filix-foemina cyclosorum Ledeb, Fl Ross 4:519 (1853).—Asplenium filix-foemina cyclosorum Rupr, D. C. Eaton in US Geol surv W 100th Merid 6:331 (1879).

PHYLLITIS Ludwig, Inst Hist Phys Reg Veg ed 2, 142 (1757) .

Sori linear, confluent in pairs, which appear like a single sorus with the double indusium opening in middle.

P. SCOLOPENDRIUM Newm, Hist Brit Ferns ed 2, 10 (1844).

Hart's-tongue; Caterpillar fern; Hound's tongue fern. Stipes 2-6′ long, fibrillose below; fronds oblong-lanceolate from an auricled heart-shaped base, entire or undulate, 7-18′ long, 1-2′ wide, bright g. Can; Vt; Tenn; Alk? Synonyms: Asplenium scolopendrium L, Sp Pl 1079 (1753).—Scolopendrium vulgare J. E. Smith, Mem ac Roy Sci Turin 5:421 (1793).—S. scolopendrium Karst, Deutsch Fl ed 1, 278 (1880-3).

CAMPTOSORUS Link, Hort Berol 2:69 (1833).

Sori oblong or linear, borne partly on veins parallel to midrib, partly on veins oblique to midrib. 2 sp.

C. RHIZOPHYLLUS Link, Hort Berol 2: 69 (1833).

Walking-leaf; walking fern; Wall link. Fronds evergreen, tufted, spreading or procumbent, 4-9′ long, lanceolate from an auricled, heart-shaped or oft hastate base, tapering above into a slender prolongation which oft rts at apex. Can: Me; Minn; Kans; Ala; Ga. Synonyms: Antigramma rhizophylla J. E. Smith.— Scolopendrium rhizophyllum Hooker.—

Asplenium rhizophyllum L.

Variety **INTERMEDIUS** Arthur, bot gaz 8:200 t 3 (1883).

Base acute, without proper auricles, with a single fibro-vascular bundle in stipe. Ia.

Tribe **ASPIDIEAE.** Sori dorsal, round or roundish, on back or rarely on apex of a vein; indusium com membranous, rarely 0.

*Without indusia. Phegopteris.

**With indusia. A.—Indusia superior. Aspidium, Nephrolepis.

**AA.—Indusia fixed by a broad base partly under sorus. Cystopteris.

**AAA.—Indusia obscure; fertile frond much contracted, very unlike sterile Onoclea.

**AAAA.—Indusia inferior. Woodsia.

Genus PHEGOPTERIS Fee.

Sori round, rather sm, borne on back of the free veins below apex; stipe continuous with rtstock. Beech-fern, about 100 sp.

Section **EUPHEGOPTERIS.** Veins free.

*Fronds triangular, bipinnatifid; pinnae sessile, adnate to a winged rachis.

P. POLYPODIODES Fee, Gen Fil 243 (1850-22. B 2:345.

Stipes 6-9′ long; fronds longer than broad, 4-9′ long, 4-6′ broad, hairy on veins especially beneath; pinnae linear-lanceolate, lowest pair deflexed and standing forward, segs oblong, obtuse, entire, basal ones decurrent and adnate to main rachis; sori near margin. Newfoundland; Alk; Va; Mich; Ia; Wash; Greenland. Synonyms: P. vulgaris Mett. —Polypodium phegopteris L, Sp Pl 1089 (1753).—Phegopteris phegopteris Undw, Small, Torr cl b 20:462 (1893).

P. HEXAGONOPTERA Fee.

Stipes 8-18′ long, stramineous, naked; fronds as broad as long or nearly so, 7-12′ long, slightly pubescent, oft finely glandular beneath; upper pinnae oblong, obtuse, toothed or entire, the very large lowest pinnae elongate and pinnately lobed; sori near margin or some between sinus and midrib. Can; Ill; Ky; Fla; La; Minn. Synonym: Polypodium hexagonopterum Michx, Fl Bor Am 2: 271 (1803).

**Fronds oblong lanceolate, 3-pinnatifid; rachis wingless.

P. ALPESTRIS Mettenius, Fil Hort Lips 83. B 2:345.

Rtstock short, thick, erect, or oblique; stipes 4-10′ long, with a few brown, spreading scales near base; fronds 1-2° long; pinnae deltoid-lanceolate, lower one distant and decreasing moderately; pinnules oblong-lanceolate, incised and toothed; sori small, round, submarginal. Cal; BC; Mont. Synonyms: Polypodium alpestre Hoppe, Taschenb 216 (1805).— Aspidium alpestre Swz.

***Fronds ternate, the 3 divisions petioled; rachis wingless.

P. DRYOPTERIS Fee. B 2:345.

Oak fern. Rtstock slender, creeping; fronds broadly triangular, 4-8′ wide; the 3 primary divisions 1-2-pinnate; segs ob-

long, obtuse, entire or toothed; sori near margin. Newfoundland; Alk; Va; Colo; Ore; Greenland. Synonyms: Polypodium dryopteris L, sp Pl 1093 (1753).—Nephrodium dryopteris Michx.

F. ROBERTIANA Underwood. Our Native Ferns, ed 6, 109 (1900).

Stipes 6-10′ long, stramineous when dry, glandular; fronds 6-8′ long, 5-7′ wide, deltoid-ovate in outline, bipinnate, lowest pair of pinnae far the largest, pinnatifid or again pinnate; upper pinnae smaller, pinnatifid; lobed, or entire; sori copious, forming submarginal rows around segs. Minn; Ia; Id; Labrador to Manitoba. Synonyms: Polypodium robertianum Hoffm, Deutsch Fl 2: add 4 (1795).—Phegopteris dryopteris robertiana Dav, Cat Dav Hb Suppl 47 (1883).—P. calcarea Fee, Gen Fil 243 (1850-2).

Section **GONIOPTERIS** Presl. Veins pinnate, lower veinlets of contiguous groups uniting.

F. TETRAGONA Fee.

Rtstock creeping; stipes erect, 6-18′ long, naked or slightly villose; fronds 1-2° long, 6-12′ broad; pinnae num, spreading, 3-6′ long, lowest narrowed at base and sometimes stalked, deeply pinnatifid; texture thinly herbaceous; rachis and under surface finely pubescent; sori in rows near midrib. Marion Co, Fla (Reynolds).

F. REPTANS D. C. Eaton, Torr cl b 10; 101 (1883).

Rtstock short, creeping; stipes 3-10′ long, clustered, gray-stramineous, slender, naked; fronds 4-12′ long, membranous, softly hairy with branched or stellate hairs, oblong-lanceolate, pinnate with nearly or quite sessile, oblong, crenately pinnatifid pinnae, apex pinnatifid, oft elongate and rt-ing; veins pinnate, simple, basal veinlets oft anastomosing; sori on middle of veinlets, rather small, sometimes with a minute rudimentary indusium. Fla. Synonyms: Polypodium reptans Swz, Fl Ind Occ 3: 1655 (1806).—Aspidium reptans Mett.

Genus ASPIDIUM Swartz.

Indusium orbicular and fixed by the center, or reniform and fixed by sinus, opening all round margin; sori mostly on back of veins. The sections of this genus, as formerly understood, now constitute the genera Dryopteris, Polystichum, Phanerophlebia and Tectaria, which see.

TECTARIA Cav.

Veins anastomosing copiously.

T. TRIFOLIATA Cav.

Stipes tufted, 1° or more long, brownish, scaly at base; fronds 1-1½°long, ½-1° broad, with a large ovate-acuminate terminal pinna narrowed or forked at base, and 1 or 2 lateral ones on each side, the lowest mostly forked; primary veins distinct to margin; areolae fine, copious, with free included veinlets; sori in rows near main veins; indusia orbicular, peltate. Fla; Tex. Synonyms: Polypodium trifoliatum L, sp Pl 1087 (1753).—Aspidium trifoliatum Swz, Schrad J bot 1800 (2):30 (1801).—Dryopteris trifoliata Kuntze, Rev Gen Pl 2:814 (1891).

PHANEROPHLEBIA Presl, Tent Pterid 84 (1836).

Indusium peltate; fronds simply pinnate with broad pinnae; veinlets com uniting slightly near margin.

P. AURICULATA Underwood, Torr cl b 26:212 t 359 f 3-4, t 36 f 2 (1899).

Stipes tufted, clothed below with large scales; fronds ½-2° long, coriaceous; pinnae 2-12 pairs, short-stalked, ovate-oblong or broadly lanceolate, terminal one distinct, and in small fronds the largest, appressed- serulate, smooth on both surfaces; veins pinnate, veinlets few, free or uniting near margin; sori scattered in several irregular rows. Tex; Ar. Synonym: Aspidium juglandifolium in part of recent authors, not Kunze, Klotzsch, Linnaea 20:363 (1847).

POLYSTICHUM Roth, Tent Fl Germ 3: 69 (1800).

Indusium orbicular and entire, peltate, fixed by depressed center; pinnae and pinnules com auricled on upper side at base, mucronately serrate; veins free.

*Fronds simply pinnate, long-stalked, lanceolate.

P. ACROSTICHOIDES Schott, Gen Fil 1834.

Christmas fern; evergreen wood-fern; Shield fern. Stipes 6-8′ long, densely clothed below with pale brown lanceolate scales; fronds ½-2° hi, 3-5′ broad; pinnae linear-lanceolate, somewhat falcate, half-halbred-shaped at base, serrulate with appressed bristly teeth; fertile ones contracted and smaller, bearing contiguous sori near middle, soon covering entire surface. Nova Scotia; Wis; Ia; Miss; Fla. Synonyms: Nephrodium acrostichoides Michx, Fl Bor Am 8:267 (1803).—Aspidium acrostichoides Swz, Syn Fil 44 (1806).—Dryopteris acrostichoides Kuntze, Rev. Gen Pl 2: 812 (1891).

P. MUNITUM Presl, Tent Pterid 83 (1836).

Stipes 4-12′ long, chaffy like rachis with brown scales; fronds growing in a crown 1-4° long, tapering slightly toward base; pinnae num, linear-acuminate, 3-4′ long, very sharply and oft doubly serrate, with appressed needle-like points; sori num, forming 1 row each side of midrib half-way to margin. Cal; Ore; Id; Alk. Synonyms: Aspidium munitum Kaulf, Enum Fil 236 (1824).—Dryopteris munita Kuntze, Rev Gen Pl 2:813 (1891.)

**Fronds simply pinnate, scarcely stalked, linear-lanceolate.

P. LONCHITIS Roth, Tent Fl Germ 3: 71 (1800).

Holly fern. Fronds 9-20′ long rigid; pinnae 1′ or more long, broadly lanceolate-falcate, or lowest triangular, strongly auricled on upper side, lower obliquely truncate, deeply spinulose-toothed; sori contiguous and near margin. Can; Wis; Ut; Cal; Wash; Mont; Colo; Artic Am. Synonyms: Polypodium lonchitis L, sp Pl 1088 (1753).—Aspidium lonchitis Swz, Schrad J bot 1800 (2):30 (1801).—Dryopteris lonchitis Kuntze, Rev Gen Pl 2:813 (1891).

***Fronds bipinnate or nearly so.

F. SCOPULINUM Maxon, Fern b 8:29 (1900).

"Stalk very short; frond narrowly lan-

ceolate, less than 1° lg, scarcely 1½′ wide, sub-coriaceous, chaff mostly decid, pinnate; pinnae num, 7-9″ long, 4-6″ wide at base, ovate, rather obtuse, lower part pinnately lobed, upper half serrate with pointed and barely aculeate teeth, sori remote from margins."—D. C. Eaton, Ferns NA 2:125 t 62 f 8 (1880), as Aspidium aculeatum scopulinum, citing Aspidium Lonchitis Eaton, in Coulter's report in Hayden's 6th ann r of Geol Surv Terr 1872:788, as synonym. Wash; Id; Ut; Southern Cal; Quebec.

P. LEMMONI Underwood, Our Native Ferns, ed 6, 116 (1900).

Stipes tufted, 2-6′ long, more or less densely clothed with lanceolate dark brown scales; fronds ½-1° long, 2-3′ broad, with num dense oft imbricated. lanceolate pinnae, which are cut below into slightly toothed oblong rhomboidal pinnules; teeth blunt or mucronate; texture coriaceous; both surfaces naked; rachis stout, compressed, scaly; veins close, immersed; sori copious. Cal; Alk. Synonym: Aspidium Mohriodes of Am authors, not Bory, Crypt Voy Duperr 267 (1828).

P. CALIFORNICUM Underwood, Our Native Ferns, ed 6, 116 (1900).

"Stalks rather long; frond much elongated, scarcely narrowed at base, thinly subcoriaceous, pinnae very num, lance-linear, but slightly incised above middle, more and more deeply cut towards rachis, segs rhomboid-ovate, acute, serrate with incurved aculeate teeth, the lowest superior one the largest, but scarcely distinct as a pinnule, and not at all auricled."—D. C. Eaton, Ferns NA 2:124, as Aspidium aculeatum californicum, citing Ferns of the southwest 336, and Aspidium californicum Eaton, in Am ac pr 6:555 (1865). and Baker, Syn Fil 253, as synonym. Cal; Wash. Synonym: Dryopteris aculeata californica Underwood, Our Native Ferns ed 4, 112 (1893).

P. BRAUNII Lawson, Fern Fl Can [19] (1889).

"Stalk very short; frond elliptical-lanceolate, tapering from the middle to both base and apex, bipinnate; pinnules mostly distinct and very short-stalked, ate or trapezoid-oblong, obtuse, truncate and almost rectangular at base, slightly auricled, sharply serrate with incurved teeth, chaffy and fibrillose beneath."—D. C. Eaton, Ferns NA 2:124, as Aspidium aculeatum braunii, and cites Doell, Rheinische Flora 27.— Gray, Man ed 2,599.—Milde, Fil Eur et Atlant 108.—Aspidium Braunii Spenner. Fl Frib 1:9 t 2; Mettenius, Fil Hort Lips 88.—Aspidium aculeatum Pursh. Fl Am Sept 2:662, and Am authors generally.

Nova Scotia; Alk; BC; Mich; Pa; Vt; NH; Me. Synonyms: Dryopteris aculeata braunii Koch, Underwood, Our Native Ferns ed 4, 112 (1893).—D. braunii Underwood in Brit & Brown Ill Fl 1:15 (1896).

P. ACULEATUM Roth, Tent Fl Germ 3: 79 (1800).

Rtstock stout, erect; stipes variable in length, very chaffy with large and

small scales intermixed as in rachis; fronds 1-2° long, growing in a crown, oblong-lanceolate, pinnate; pinnae closely placed, lanceolate from a broad base, mostly curved upwards, incisely pinnatifid or again pinnate; segs or pinnules of variable shape, oval-rhomboidal, or unequally triangular-ovate and auriculate on upper side of slightly stalked base, teeth aculeate in various degrees; under surface more or less chaffy-fibrillose; sori in 2 rows, on segs nearer midvein than edge. Cal; Mt Peddo, Wash (Suksdorf). Synonyms: Polypodium aculeatum L, Sp Pl 1090 (1753).—Aspidium aculeatum Swz, Schrad J bot 1800 (2): 37 (1801).—Dryopteris aculeata Kuntze, Rev Gen Pl 2: 812 (1891).

DRYOPTERIS Adans, Fam Pl 2:20 (1763).

Indusium cordato-reniform or orbicular with a narrow sinus; veins free.

*Texture thin—membranous, veins simple or 1-forked, fronds 2-pinnatifid.

I.—Lowest pinnae gradually reduced to mere lobes.

D. OREOPTERIS Maxon, US Na Mu pr 23:638 (1901).

Heath fern. Rtstock short, erect or decumbent, scaly ;stipes short, tufted, scaly below; fronds 1½-2° long firm, membranous, broadly lanceolate, gradually tapering and attenuated below, glandular; pinnae 2-3′ long, sessile from a broad base, lanceolate-acuminate, deeply pinnatifid, gradually shorter to the lowest, which are more distant, deltoid, and less than 1′ long; segs flat, nearly entire, oblong; sori quite marginal; indusia delicate, membranous, more or less toothed at margin, BC; Alk; Wash. Synonyms: Aspidium oreopsis Swz, Schrad J bot 1800 (2); 35 (1801).—Polypodium montanum J. A. Volger, Dissert Polyp Mont 1781, not Lam, 1778.—Dryopteris montana Kuntze, Rev. Gen Pl 2:813 (1891).

D. NEVADENSE Underwood, Our Native Ferns, ed 4, 113 (1893).

Rtstock creeping, densely covered with persistent bases of former stalks; fronds in a crown, 1½-3° long, lanceolate; pinnae linear-lanceolate from a broad base, deeply pinnatifid, lower pairs distant and gradually reduced to mere auricles; segs crowded, oblong, slightly hairy on veins beneath, and sprinkled with minute resinous particles; veins about 7 pairs to a lobe; sori close to margin; indusium minute, furnished with a few dark-colored marginal glands, and bearing several straight jointed hairs on upper surface, Cal; Ore. Synonym: Aspidium Nevadense D. C. Eaton, Ferns NA 1:73 t 10 (1878).

D. CONTERMINA (Nephrodium conterminum Desv).

Variety **STRIGOSA** Underwood, Our Native Ferns, ed 4, 113 (1893).

Rtstock stout, erect, oft extending 1° above ground, bearing a crown of fronds; stipes very stout, narrowly wing--margined at base; fronds 1-4° long, lanceolate in outline, caudate-acuminate, much narrowed at base, somewhat rigid, pinnate; pinnae sessile, nar-

rowly lanceolate from a broader base, acuminate, deeply pinnatifid into oblong, obliquely subfalcate, obtuse segs; under surface copiously dotted with resinous globules; veins free, simple; sori near margin; indusium reniform, minute, glandular, somewhat pilose, evanescent. Fla. Synonyms: Aspidium strigosum Fee, Hist Fouget Lycop Antille 78 t 22 f 2 (1866).—Aspidium conterminum Strigosum D. C. Eaton, Torr cl b 7:62 (1880).—Nephrodium conterminum Desv, in part.

D. NOVEBORACENSIS A. Gray, Man ed 1, 630 (1848).

New York fern. Rtstock slender, creeping; fronds 1-2° long, 4-6′ broad, lanceolate, tapering both ways from middle; pinnae lanceolate, 2 or more lowest pairs gradually shorter and deflexed, those of barren frond broader; segs flat, oblong, basal ones oft enlarged; veins simple or forked in basal lobes; sori distinct, near margin; indusium minute, margin glanduliferous. Newfoundland; Minn; Ga; Ala; Ark. Synonyms: Polypodium noveboracense L, Sp Pl 1091 (1753).—Aspidium noveboracense Swz, Schrad J bot 1800 (2): 38 (1801).—A. thelpteroides Ewz.—Nephrodium noveboracense Desv.—Lastrea noveboracensis J. E. Smith.

II.—Lower pinnae little smaller than those above.

D. THELYPTERIS A. Gray, Man ed 1, 630 (1848).

Marsh fern; Snuff-box fern: Rtstock slender; fronds 1-2° long, 4-6′ broad, lanceolate, pinnae mostly horizontal, linear-lanceolate; segs oblong, entire, obtuse or appearing acute in fr from the strongly revolute margins; veins mostly forked, bearing sori near their middle; indusia minute, smooth, naked. New Brunswick; Manitoba; Kans; Tex; Fla. Synonyms: Acrostichum thelypteris L, sp Pl 1071 (1853).—Aspidium thelypteris Swz, Schrad J bot 1800 (2): 40 (1801).—Polypodium thelypteris L.—Nephrodium thelypteris Desv.—Lastrea thelypteris J. E. Smith.

D. PATENS Kuntze, Rev. Gen Pl 2:813 (1891).

Sweet fern. Rtstock rather stout, bearing several fronds at growing end; fronds 2-3° long, 4-10′ broad, ovate-oblong, softly pubescent beneath; pinnae closely placed, linear-acuminate, lowest pair somewhat deflexed, all cut ¾ of way to midrib; segs num, acutish, basal ones longest; veinlets evident, lowest ones of adjoining segs oft uniting; sori near margin; indusia very pubescent. Fla; Ala; Cal. Synonyms: Polypodium patens Swz, Prodr Veg Ind Occ 133 (1788).—Aspidium patens Swz, Syn Fil 49 (1806).—A. molle Swz, Schrad J bot 1800 (2): 34 (1801).

D. SIMULATA Davenport, bot gaz 19: 497 (1894), as syn.

Me to Md; Mo. Synonym: Aspidium simulatum Davenport, bot gaz 19:497 (1894).

**Texture firmer or subcoriaceous, veins forking freely.

I.—Fronds pinnate; pinnae cut into

spreading triangular lobes; sori confluent.

D. UNITA Kuntze, Rev Gen Pl 2:811 (1891).

Stipes 1-1½° long, brownish, naked; fronds 1½° or more long, 5-8′ broad; pinnae narrow, cut from 1-3d to halfway down into sharp, pointed lobes; lower pinnae not reduced; veins pinnate in the broad lobes with 6-8 veinlets on each side, lower ones of contiguous groups united; sori near ends of veins principally in lobes. Fla. Synonyms: Polypodium unitum L, Sp Pl ed 2, 1546 (1764).—Aspidium unitum glabra Mett, Ann Mus bot Ludg Bat 1:230 (1863-4), not A. glabrum Mett (1856-8).

II.—Fronds bipinnatifid or bipinnate; indusia rather large; segs not spinulose.

A.—Fronds small, narrowly lanceolate.

D. FRAGRANS Schott, Gen Fil 1834

Fragrant fern. Fronds 4-12′ hi, glandular and aromatic; pinnae linear-oblong, pinnately parted; segs toothed or nearly entire, nearly covered beneath with very large thin imbricate indusia, which are orbicular with a narrow sinus, margin ragged and sparingly glanduliferous. Labrador; Alk; NY; Wis; Minn; Vt; NH; Me; Greenland. Synonyms: Polypodium fragrans L, sp Pl 1089 (1753).—Aspidium fragrans Swz, Schrad J bot 1800 (2):35 (1801).

II.—AA.—Fronds larger, mostly 2-4° hi.

(1). Fronds bipinnatifid or nearly twice pinnate; indusia large, thinnish and flat.

D. FLORIDANA Kuntze, Rev Gen Pl 2: 812 (1891).

Stipes 6-10′ long, sparingly clothed with ovate scales; fronds lanceolate, 18-20′ long, 5-8′ broad; fertile pinnae confined to upper half of frond, narrowly lanceolate, cut down to narrowly winged secondary rachises into oblong, distinct pinnules; sterile pinnae broader, shorter, and sub-deltoid below, less deeply cut. Fla; Ala. Synonyms: Nephrodium floridanum, Hooker, Fil Exot t 99 (1859).—Aspidium floridanum D. C. Eaton, in Chapman's Fl So US ed 1,595 (1860).—A. cristatum floridanum Hooker.

D. CRISTATA A. Gray, Man ed 1, 631 (1848).

Crest fern; Crested shield fern. Fronds linear-oblong or lanceolate in outline, 1-2° long; pinnae short, 2-3′ long, triangular-oblong or lowest nearly triangular, deeply pinnatifid; segs 6-7 pairs, finely serrate or cut-toothed; sori as near midvein as margin; indusia smooth, naked. Can; Ark; Id; Nebr; Va. Synonyms: Polypodium cristatum L, sp Pl 1090 (1753).—Aspidium cristatum Swz, Schrad J bot 1800 (2): 37 (1801).—A. lancastriense Spreng.—Nephrodium cristatum Michx.—Lastrea cristata Presl.

Variety **CLINTONIANA** Underwood, Our Native Ferns, ed 4, 115 (1893).

Fronds much larger, 2½-4° long; pinnae oblong-lanceolate, broadest at base, 4-6′ long, 1-2′ broad, deeply pinnatifid; segs 8-16 pairs, crowded or distant, linear-oblong, obscurely serrate; veins pinnately forking, bearing sori near mid-

vein. Me; Wis; Va. Synonym: Aspidium cristatum clintonianum D. C. Eaton, in Gray Man. ed 5, 665 (1867).

D. GOLDIANA A. Gray, Man ed 1, 631 (1848).

Goldie's fern. Fronds broadly ovate, 2-4° long; pinnae 6-9' long, broadest in middle, pinnately parted; segs about 20 pairs, oblong-linear, subfalcate, serrate with appressed teeth; veins bearing sori very near midvein; indusia very large, orbicular with a narrow sinus. New Brunswick; Minn; NC; Tenn; Ia; Ky. Synonyms: Aspidium goldianum Hooker, Edinb Phil J 6:333 (1822).—Nephrodium goldieanum Hooker.—Lastrea Goldieana J. E. Smith.

Variety **CELSA** Palmer, Biol soc Wash pr 13:65 t 1 f 1-6, 8-12 (1899).

Log fern. Dismal swamp, Va (Wm. Palmer; Bartsch).

(2) Fronds mostly bipinnate; indusia convex, marginal glands 0.

D. FILIX-MAS Schott, Gen Fil 1834.

Male fern; Sweet fern. Rtstock short, stout; fronds in a crown, 1-3° hi, broadly oblong-lanceolate, slightly narrowed toward base, bipinnatifid or bipinnate; pinnules oblong, smooth, polished beneath, larger ones pinnately incised; sori large, near midvein, com on lower half or 2-3 ds of seg; indusia firm, smooth; rachis more or less chaffy. Can; Colo; Ar; Cal; Ore; Alk; Mich; SDak. Synonyms: Polypodium filix-mas L sp Pl 1090 (1753).—Aspidium filix-mas Swz, Schrad J bot 1800 (2): 38 (1801).—Nephrodium filix-mas Rich.—Lastrea filix-mas Presl.

D. MARGINALIS A. Gray, Man ed 1, 632 (1848).

Marginal shield fern; Rock fern; Wood fern. Fronds smooth, nearly corfaceous in texture, 6'-2° long, ovate-oblong; pinnae lanceolate, broadest just above base; pinnules oblong or oblong-falcate, entire or crenately toothed; sori near margin. Nova Scotia; BC; Ark; Ala; Ga. Synonmys: Polypodium marginale L, Sp Pl 1091 (1753).—Aspidium marginale Swz, Syn Fil 50 (1806).—Nephrodium marginale Michx.—Lastrea marginalis J. E. Smith.

III.—Fronds bipinnate or 3-pinnatifid; segs spinulose-toothed.

D. RIGIDA (Aspidium rigidum Swz.).

Variety **ARGUTA** Underwood, Our Native Ferns, ed 4, 116 (1893).

Rtstock short, stout; fronds in a crown on chaffy stalks, half-evergreen, smooth above, paler and more or less glandular beneath, 1-3° hi, ovate-lanceolate or triangular-l, bipinnate; pinnae broadly oblong-lanceolate, lowest ones broadest, scarcely shorter than middle ones; pinnules oblong, incised or doubly serrate with spinulose teeth; indusia firm, convex, edge bearing short-stalked glands. Cal; Ore; Alk; chiefly near coast. Synonyms: Aspidium argutum Kaulf, Enum Fil 242 (1824).—A. rigidum argutum D. C. Eaton, in US Geol Surv W 100th Merid 6:333 (1879).

D. SPINULOSA Kuntze, Rev. Gen Pl 2: 813 (1891).

Spiny shield fern. Stipes with a few, pale brown, decid scales; fronds ovate-lanceolate, bipinnate, pinnae oblique to rachis, elongate-triangular, lower pairs broadly triangular; pinnules oblique to midrib, connected by a very narrow wing, oblong,incised or pinnatifid with lobes spinulose- toothed; indusia smooth, marginal glands 0. Newfoundland; Alk; Va; Ky; Nebr; Wash. Synonyms: Polypodium spinulosum Retz. Fl Sand ed 2, 250 (1795).—Aspidium spinulosum Swz, Schrad J Bot 1800 (2):38 (1801.—Nephrodium s Desv.—Lastrea spinulosea Presl.

Variety **INTERMEDIA** Underwood, Our Native Ferns, ed 4, 116 (1893).

Scales of stipes few, brown with a darker center; fronds oblong-ovate, 2-3-pinnate; pinnae spreading, oblong-lanceolate, lowest unequally triangular-ovate; pinnules crowded, pinnately divided; margin of indusium denticulate and beset with stalked glands. Can; Tenn; NC; Alk; Labrador. Snyonyms: Aspidium intermedium Muhl, Willd sp Pl 5:202 (1810).—A. americanum Dav.—A. spinulosum intermedium D. C. Eaton in A. Gray, Man ed 5, 665 (1867).—Dryopteris intermedia A. Gray, Man ed 1, 630 (1848).

Variety **DILATATA** Underwood, Our Native Ferns, ed 4, 116 (1893).

Spreading wood fern. Scales of stipes large, brown with a darker center; fronds broadly ovate or triangular-ovate, com 3-pinnate; pinnules lance-oblong, lowest oft much elongated; indusia smooth and naked. Newfoundland; Alk; Cal; Ore; Mont; Va. Synonyms: Polypodium dilatatum Hoffm. Deutsch Fl 2: 7 (1795).—Aspidium spinulosum dilatatum Hooker, Brit Fl 444 (1830).—Dryopteris dilatata A. Gray Man ed 1, 631 (1848).—Aspidium dilatum Swz.—A campylopterum Kunz.—Nephrodium dilatatum Desv.—Lastrea dilatata J. E. Smith.

D. BOOTTII Underwood. Our Native Ferns, ed 4, 117 (1893).

Boott's wood fern. Scales of stipes pale brown; fronds elongate-oblong or elongate-lanceolate in outline; pinnules broadly oblong, very obtuse, lower pinnatifid, upper and smaller merely serrate; indusia minutely glandular. Can; Alk; Minn; Va. Synonyms: Aspidium boottii Tuckerman, Hovey's Mag hort 9:145 (1843).—A. spinulosum boottii D. C. Eaton, in Gray Man, ed 5, 665 (1867).

D. PATULA Underwood, Our Native Ferns ed 4, 117 (1893.)

Stipes tufted, 8-12' long stramineous, scaly at base; fronds pale g, 1-2° long, ½-1° broad, ovate-lanceolate; pinnae lanceolate or lower subdeltoid; rachis and both surfaces naked; sori in rows midway between edge and midrib; indusium conspicuous, naked, Huachuca mts, Ar (Lemmon). Synonyms: Aspidium patulum Swz, Konigl Vetensk Ak ad Handl 1817:74.—A. karwinskyanum of Lemmon's distribution.—Nephrolepis patulum Baker.—N. mexicanum Hooker.

NEPHROLEPIS Schott.

Indusium reniform, fixed at sinus or at arcuate base, opening toward margin of frond; sori at end of free veins. Trop-

ical, 7 sp.

N. EXALTATA Schott.

Stipes tufted, 4-6′ long, naked or slightly scaly; fronds 1-6° long, 3-6′ broad; pinnae close, lanceolate-edge entire or slightly crenate, upper side auricled at base, lower rounded: rachis nearly naked; sori submarginal; indusia firm, distinctly reniform. Fla. Synonyms: Polypodium exaltatum L, sp Pl ed 2, 1548 (1763).—Aspidium trifoliatum Swz, Schrad J bot 1800 (2): 32 (1801). Frequent in cult.

N. BISERRATA Schott, Gen Fil 1834.

Stipes tufted, 4-8′ long, naked or slightly scaly; fronds 2-4° long, 8-12′ broad; pinnae 4-8′ long, ½-1′ broad, acute entire or slightly crenate, upper side auricled, lower rounded at base; rachis and both sides nearly naked; sori submarginal; indusia suborbicular, subpeltate. Fla (south bank of Miami river, Holden). Synonyms: N. acuta Presl Tent Pterid 79 (1836).—Aspidium acutum Swz, Syn Fil 46 (1806).—A. biserratum Swz, Schrad J bot 1800 (2): 32 (1801).

FILIX Adans, Fam Pl 2:20 (1763). Cystopteris Bernh.

Indusium convex, com reflected as sporangia ripen; texture delicate.

*Fronds ovate-lanceolate, 2-3-pinnate.

F. BULBIFERA Underwood, Our Native Ferns, ed 6, 119 (1900).

Bladder fern. Stipes 4-6′ long; fronds lanceolate, elongate, 1-2° long, 2-3′-pinnatifid, pinnae lanceolate-oblong; pinnules crowded, toothed or pinnatifid; rachis wingless, often bearing bulblets underneath; indusia short, truncate on free side. Alk; Can; Ia; NC; Ark; Ala. Synonyms: Aspidium bulbiferum Swz.—Nephrodium bulbiferum Michx.—Polypodium bulbiferum L, Sp Pl 1091 (1753).—Cystopteris bulbifera Bernh, Schrad Neues J bot 1 (2): 26 (1806).

F. FRAGILIS Underwood, Our Native Ferns ed 6, 119 (1900).

Fronds oblong-lanceolate, 4-8′ long, 1-2½′ broad, 2-3-pinnate; pinnae and pinnules lanceolate or ovate in outline, decurrent along margined or winged rachis; indusia tapering or acute at free end. Labrador; Alk; Cal; Ar; Ala; Ga. Synonyms: Aspidium tenue Swz.—Polypodium fragile L, sp Pl 109 (1753).—Cystopteris fragilis Bernh, Schrad Neues J bot 1 (2):27 (1806).—and many varietal names.

**Fronds deltoid-ovate, 3-4-pinnate.

F. MONTANA Underwood. Our Native Ferns ed 6, 119 (1900).

Rtstock long, slender, creeping; stipes 6-9′ long, slender; fronds 6′ each way; lowest pinnae deltoid-lanceolate, much larger than these above, their inferior pinnules 1-1½′ long; segs cut to rachis into oblong lobes, deeply and sharply toothed; sori num. Labrador; Colo; Alk; BC. Synonyms: Polypodium montanum Lam, Fl Franc 1:23 (1778).—Cystopteris montana Bernh, Schrad Neues J bot 1 (2): 26 (1806).

ONOCLEA L, sp Pl 1062 (1753).

Sori dorsal on veins of contracted pinnae, concealed by their revolute margins; veins of sterile frond copiously anastomosing.

O. SENSIBILIS L, sp Pl 1062 (1753).

Sensitive fern; Oak-leaved fern. Fertile fronds bipinnate, much contracted; pinnules short, com rolled up and converted into berry-shaped closed involucres, and forming a 1-sided panicle; sterile fronds broadly triangular, deeply pinnatifid into lanceolate-oblong pinnae, which are entire, undulate, or lowest pair sinuate pinnatifid; veins copiously anastomosing. Can; Fla; Kans; Nebr; La.

Variety **OBTUSILOBATA** Torrey.

Sterile fronds again pinnatifid, more or less contracted and revolute, and bear a few sori; fertile fronds more or less foliose.

MATTEUCCIA Todaro, Syn Pl Acot Vasc Sicilia 30 (1866).

Veins all free, oft included in Onoclea (section Struthiopteris Willd.)

M. STRUTHIOPSIS Todaro, Syn Pl Sicilia 30 (1866).

Ostrich fern. Fertile fronds 1-1½° long, simply pinnate with necklace-shaped pinnae formed of strongly revolute margins; sterile fronds 2-6° long, growing in a crown, broadly lanceolate, bipinnatifid, lowest pinnae gradually much shorter; veins pinnate, free and simple; sori crowded and confluent. Nova Scotia; Va; Ia; BC. Synonyms: Onoclea struthiopteris Hoffm. Deutsch Fl 2:11 (1795).—O. germanica Willd.—O. nodulosa Michx.—Struthiopteris pennsylvanica Willd.—S. germanica Willd Enum Pl Hort bot Berol 1071 (1809).—Osmunda struthiopteris L, sp Pl 1066 (1753).

Genus WOODSIA R. Brown.

Prodr Fl Nov Holl 1:158 (1810).

Indusium roundish or stellate, delicate cleft into irregular lobes. Named for Joseph Woods, an English botanist; 15 sp, high temperate or boreal.

Section **EUWOODSIA** Indusium minute or evanescent, open and flat from an early stage, concealed under sorus, its margin cleft into slender hairs or cili.

*Stipes obscurely jointed near base; cilia of indusium long, inflexed over sporangia.

I.—Fronds thickly clothed beneath with rusty bristle-like chaff.

W. ILVENSIS R. Br, Prodr Fl Nov Holl 1:158 (1810).

Rusty Woodsia. Fronds broadly lanceolate, smoothish above, pinnate; pinnae crowded, sessile, pinnately-parted, crowded segs oblong, obscurely crenate; sori near margin, somewhat confluent in age. Va; Ky; NC; Alk; Greenland; Minn. Syninyms: Acrostichum ilvensis L. Sp Pl 1071 (1753).—Polypodium ilvense Swz.—Nephrodium rufidulum Michx.—Aspidium rufidulum Willd.—Woodsia rufidula Beck.

II.—Fronds glabrous or nearly so.

W. ALPINA S. F. Gray, Nat Arr Brit Pl 2:17 (1821).

Alpine woodsia. Stipes and rachis sometimes slightly hairy; fronds linear-lanceolate, pinnate; pinnae cordato-ovate, pinnatifid with 5-7 broadly obo-

vate entire lobes. Vt; NY; Can; Alk; Greenland. Synonyms: Acrostichum alpinum Bolton, Fil Brit 76 t 42 (1790).—A. hyperboreum Liljeb, Kongl Vetensk Akad Nya Hendl 14:201 (1793).—Woodsia hyperborea R. Br, Prodr Fl Nov Holl 1:158 (1810).

W. GLABELLA R. Br.

Smooth and naked thruout; fronds linear, tapering slightly below, 2-5′ hi, pinnate; pinnae deltoid or ovate, lower rather remote, cut into 3-7 rounded or subcuneate entire lobes. Vt; NY; BC; Alk; Greenland.

**Stipes not jointed; cilia of indusium very short, hidden by sporangia.

W. SCOPULINA D. C. Eaton. Can Nat II, 2:90 (1865). B 2:348.

Rtstock short, creeping, very chaffy; stipes 2-4′ long, puberulent like rachis and under surface of frond with minute flattened hairs and stalked glands; fronds lanceolate, 4-8′ long, pinnate; pinnae num, oblong-ovate, pinnatifid with 10-16 sh ovate or oblg toothed divisions; indusia very delicate, deeply cleft into laciniae which terminate in short hairs. Colo; Ar; Cal; Ore; Alk.

WOODSIA OREGANA Eaton.
B 2:348.

Stipes and fronds smooth; fertile fronds taller than sterile ones; pinnae triangular-oblong, pinnatifid; segs oblong or ovate, toothed or crenate; teeth often reflexed and covering submarginal sori; indusia very minute, divided almost to center into a few beaded hairs. Ar; Ut; Colo; Ore; Cal; Wis; Mich; Ok; Mo; Ky; BC, Manitoba.

WOODSIA MEXICANA Fee.
7 me Mem Fam Foug 66 (1854).

Stipes 2-3′ long, smoothish, or with a few scattered scales; fronds 3-9′ long, lanceolate; pinnae sub-opp ,triangular-lanceolate, pinnately divided into finely toothed segs, teeth in young fronds ending in delicate, semi-transparent, ciliated tips; sori near margin, broad, confluent; receptacles dot-like, scales of indusium 4, laciniate, narrow, dividing at end into articulated hairs; sporangia nearly sessile. Ar; NM; Baja mts!

Section **HYPOPELTIS** Torrey. Indusium conspicuous, at first enclosing sporangium, but early opening at top and splitting into several spreading jagged lobes.

W. OBTUSA Torrey, Cat Pl in Geol R NY 195 (1840).

Stipes not jointed, 3-6′ long; fronds broadly lanceolate, minutely glandular-hairy, 6-12′ hi, nearly bipinnate; pinnae rather remote, triangular-ovate or oblong, pinnately parted; segs oblong, obtuse, crenately toothed, lower ones pinnatifid; veins forked. Nova Scota; Ga; Ala; Tex; Wis; Nebr; Alk; BC. Synonyms: Polypodium obtusum Spreng, Anleit Kennt Gewachse ed 1, 3:92 (1804).—Woodsia perriniana H & G.—Aspidium obtusum Willd.—Cheilanthes crenata Kunze.—Hypopeltis obtusa Torr.

Variety **PLUMMERAE** Maxon, US Nat Mu pr 23:644 (1901).

Smaller and more glandular. NM; Ar. Synonyms: W. obtusa glandulosa D. C. Eaton and Faxon, Torr el b 9:50 (1882).—W. plummerae Lemmon, bot gaz, 7:6 (1882).

Tribe **DICKSONEAE.** Sori roundish or transversely elongate, borne at ends of veins or on marginal cross-veinlets, with an indusium attached at base or base and sides and opening toward margin of seg.

DICKSONIA L'Her.

Sori marginal, small, indusium cup-shaped, somewhat 2-valved, under portion confluent with a lobule of frond. Named for James Dickson, an English botanist; about 50 sp, many arborescent.

D. PILOSIUSCULA Willd, Enum Pl Hort Berol 1076 (1809).

Rtstock slender, extensively creeping, naked; stripes stout, chaffless; fronds 1-2½° long, 5-9′ broad, ovate-lanceolate and pointed, com 3-pinnatifid; pinnae lanceolate, pointed; pinnules cut into oblong and obtuse cut-toothed lobes; rachis and under surface minutely glandular and hairy; sori minute, each on a recurved toothlet, com 1 at upper margin of each lobe. Can; Minn; Tenn; Ga; Ala. Synonyms: Dicksonia punctiloba Hooker, sp Fil 1:79 (1846).—Nephrodium punctilobulum Michx Fl Bor Am 2:268 (1803).—Aspidium punctilobulum Torrey.—Dennstaedtia punctilobula Moore, Index Fil xcvii (1857).

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A NEW LICHEN

BLASTENIA ORCUTTI Hasse.

Thallus thin of a gamboge or rich yellow color, smoothish, determinate, finely rimose, limited by a narrow black hypothalline border; apothecia sessile and elevated sessile, from 0.5-1.0 cm wide, disk flat to plano-convex, orange-red, with a subturgid, entire or slightly crenate and elevated margin, somewhat lighter in color than the disk; with Iod the disk stains purple, its margin and the thallus are not affected. Epithecium granulose, faint straw color; thecium colorless, 64-84 mic hi; paraphyses loosely adglutinated, barely thickened above; hypothecium colorless; asci clavate and subinflated clavate, 62 mic lg, 16 mic thick, the membrane thickened above; spores 8, polari bilocular, 12 mic lg, 6 mic thick, the loculi are small with a lg connecting tube, but few of the asci are seen with spores and these are ill defined; hymenial geletine with Iod. a deep blue, KHO stains the epithecium carmine, thecium and hypothecium are not affected; spermogones not seen. The bright yellow-green protococcus gonidia are 8-12 mic in diam.—H. E. Hasse (original).

On calcareous rock, Lagunas, Oax, Mexico, C. R. Orcutt, 1910.

Tho abundant, the material available for examination was scanty, type in Hasse herb.

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ECHINOCACTUS GROSSNERII, $1 each.
ECHINOCACTUS HASSELBERGI, $1 each.
ECHINOCACTUS MAMMULOSUS, $2 each.

ECHINOCACTUS MINUSCULUS, 50c each.
ECHINOCACTUS MONVILLEI, $1 each.
ECHINOCACTUS OTTONIS, 50c each.
VARIETY PARAGUAYENSIS, $1 each.
ECHINOCACTUS PLATENSIS, $1 each.
ECHINOCACTUS SCOPA, $5 each.
ECHINOCACTUS SUBMAMMULOSUS, $5 each.
ECHINOCEREUS MARITIMUS, 75c each.
ECHINOPSIS CALACHLORA, $1 each.
ECHINOPSIS DECAISNEANA, $1 each.
ECHINOPSIS DROEGEANA, $1 each.
ECHINOPSIS GEMMATA, $1 each.
ECHINOPSIS GROESSNERIANA, $1 each.
ECHINOPSIS MUHLERI, 50c each.
ECHINOPSIS MULTIPLEX, 25c each.
Variety CRISTATA, $1 each.
ECHINOPSIS OXYGONA, 50c each.
ECHINOPSIS PENTLANDI, 75c each.
Variety FEROX, $1 each.
Variety LONGISPINA, $1 each.
ECHINOPSIS PARAGUAYENSIS, $1 each.
GASTERIA AMOENA, 50c each.
GASTERIA GLABRA, 75c each.
GASTERIA GUEDNEYI, $1 each.
GASTERIA INTERMEDIA, 50c each.
GASTERIA PROLIFERA, 50c each.
GASTERIA VERUCOSA, 50c each.
RHIPSALIS PACHYPTERA Pfr.
Variety VIOLACEUM.
RHIPSALIS PTEROCARPA Weber.
RHIPSALIS PULVINIGERA Lindb.
RHIPSALIS RAMULOSA Pfr.
RHIPSALIS RHOMBEA Pfr.
RHIPSALIS SALICORNIOIDES Haw.
RHIPSALIS SCHOTMULERI Weber.
RHIPSALIS SETULOSA
RHIPSALIS SQUAMULOSA
RHIPSALIS SUAREZIANA Weber.
RHIPSALIS SWARTZIANA Weber.
RHIPSALIS TONDUZII
RHIPSALIS TRIGONA Pfr.
RHIPSALIS TUCUMANENSIS Weber.

MEXICO.

This republic now has about 15,000,000 inhabitants, according to a report of the 1910 census. Near $800,000,000 of American capital is invested, and a like amount of English money, with considerable French and German investments.

Mining is probably the greatest industry, tropical products being next in importance, coffee, rubber, cocoa, being among the largest items of export.

Land in small tracts is high priced in comparison with the cost of large areas. One-half of the best lands are said to be now owned by Americans.

C 641. **EAST KLAMATH FALLS,** Oregon, Block 6, First Addition. $600.

C 681. **GUTHRIE,** Oklahoma: Ball & Ferguson's subdivision of N ½ of N W ¼ of section 20, T 16 N R 2 W of the Indian Meridian, lot or block 9, containing 2 acres. $1000.

C 642. **RAMONA** San Diego county, California: W. two-thirds of lot 16, Valle de los Amigos, 11½ acres, one mile east of the town on the Julian stage road. Well and spring. Oak trees. Small cottage. $1200. Will rent.

C 671. **SPEARFISH,** S. D.: Lot 23, block 3, Golden Belt addition, 25x100 feet, near business center of this prosperous town. $500.

C 644. **HAFFENDEN'S** Sunnydale addition to San Diego: Lots 3 to 8, block 3, 140x167 feet. $1000. This was purchased for the sand and gravel on the property, but the prospects are that it will be finally used for homes.

C 666. **FALLBROOK,** San Diego County, California: S E ¼ of S E ¼, section 14, T 9, S R 3 W, S B M; E ½ of N E¼ and N E ¼ of S E ¼, section 23, T 9, S R 3 W, S B M, 160 acres of choice farming land, perennial spring, oak trees, etc. Part or whole at $20 per acre.

C 474. **JAMUL,** San Diego County, Californi: N E ¼ of N W ¼, section 2, T 17, S R 2 E, S B M, 40.45 acres. "Running water, perennial springs and oak trees." $1500.

C 922. **LA MESA SPRINGS,** California: S 30 acres of N W ¼ of S E ¼, section 20, T 16 S A 1 W, S B M. This lies about 1 mile east of the station, half a mile south of the proposed electric road to Escondido, with very sightly building sites. Now in native brush that shows the fertility of the soil. The

flume to Lemon Grove passes near its east line This will be sold in 5 or 10 acre tracts or as a whole at $150 per acre. Abundance of excellent water can be developed on the valley portion.

C 939. **PORT ANGELES,** Washington: Lots 1 to 24, block 11, Union Pacific second addition. $3000.

NATIONAL CITY.

National City claims more advantages than any other suburb of San Diego, having gas, electric lights, both telephones, water under high pressure, electric car service, daily paper distribution, splendid school systm, five churches, Carnegie library, and is only four miles from the center of San Diego.

There are many pleasant homes on its tree-lined streets, and near-by orange groves and olive orchards give it many of the pleasures of rural life.

C 486. **NATIONAL CITY,** California, lot 13, block 273, 25x100, on N. W. corner of 17th street and 8th avenue. Brick building 25x60 feet; cost $10,000 when new. Offered at first cost.

C 223. **CULVERWELL'S** addition to San Diego, California: Lot 12, block 2, 50x100, being 100 feet fronting on D street, improved with house of two 3-room flats. each with bath, gas, etc. $15,000.

C 664. **E. W. MORSE'S** Addition to San Diego, lots 6 and 7, block 95, on D street, between 30th and 31st, facing north, the two being 50x140 to a 20-foot alley. An ideal location for a home, having a beautiful view that cannot well be obstructed. Water, sewer, gas, and electricity are at hand. $800. Lots 8 and 9, adjoining on the west, for $1000.

CALIFORNIA:. San Francisco.
O 676. Lot 39, blk 5, Belle Air Park, San Mateo County, 25x100 ft. $600.

ORCUTT'S REAL ESTATE AGENCY
C. R. Orcutt, Manager.
SAN DIEGO, CALIFORNIA.

JUSTICIA INSOLITA Br 2:195.

"Suffrutescent, a ft or more hi, with many sh, stiff, almost spinose, minutely w-tomentose, branches; lvs oblg-ovate to lanceolate, minutely pubescent or almost glab, sh-petioled 15-20 mm lg: fls sessile, scattered; bracts & bractlets linear-acuminate: cx 7 mm lg, deeply 4-parted, the linear-acuminate seg twice as lg as bractlets: cor rose-p, about 20 mm lg, deeply bilabiate, tube very sh & broad, 2-sulcate at base in front, the two deeper posterior ones a little higher; throat ampliate rugose-veined; limb deeply bilabiate, 3 or 4 times lg'er than tube, upper lip galeate, emarginate or very sh'ly notched, the lower 3-parted into oblg-ovate lobes: sta inserted in throat; anth muriculate on sides; cells parallel but not even, widely separated by a broad connective; the upper muticous, the lower with a spur of variable length: sty filiform; stig minutely capitate; ova 4-ovuled: cap 16-18 mm lg, the sterile portion the lg'er: sds flat, oblique at base, densely covered with retrorsely barbed bristles; embryo sm in the loose testa; cotyledons oval; radical sh incurved. S Gregoria."—Br. 2:195.

VALLESIA LACINIATA Br 2:182.

"Shrubby 2-3 ft hi with sh stiff branches, & light g lvs com folding in drying: young growth densely, minutely pubescent, nearly glab in age: lvs entire oblg-lanceolate, obtuse at base, mucronately acute at apex, rather prominently pinnate-veined: 30-60 mm lg, 15-30 mm wide, on petioles 5-8 mm lg, simple or di-trichotomously once or twice branched; cymes densely 15-25 fld; pedicels 3-4 mm lg: cx cleft to base with ovate-acuminate lobes about 1 mm lg: cor 12-15 mm lg, the oblg-oval lobes hairy at base, nearly 1-third as lg as tube, which is hairy within; sta nearly sessile, triangular, apiculate: carpels of ova distinct, sty united but easily separable, stig above the ring-like thickened portion flattened, 2-lobed; ovules 10-15 in each carpel: drupe by abortion com 1, fleshy, w, oblg-oval 10-12 mm lg; endocarp in 2 layers, the inner projecting in ridges thru the oblique cribrose openings of the outer; testa endosperm & embryo all correspondingly ridged or nodulated: sd attached by a prominent bk funiculus above middle of ventral face; cotyledons thick, oblg twice as lg as stout radicle. — SSebastian, Comondu." — Br. 2:182.

CILIA GLORIOSA Br 2:184 t 9.

"Shrubby, densely branched and forming clumps 3-4 ft hi, & as broad, glandular-pubescent, strongly spinose from the persistent divaricate lvs, which in the older branches remain as blackened thorns subtending crowded fascicles of much sh'er simple acicular ones: principal lvs stout-subulate, 1 in lg or less, with 4 remote subulate lobes, the lower near base, those of axy fascicles flattened, acerose, not half as lg: fls on sh ped from upper axils: cx 10-12 mm lg, nearly twice as lg as ped, the linear-acerose lobes nearly as lg as tube, which is membranous in intervals: cor pale pink, or nearly w, shading into rose-color; tube funnelform, twice as lg as the equally-cleft oval entire lobes, and 3 times as lg as cx; fil attached to lower third of tube naked, straight, exserted; anth sagittate at base: sty sh'ly 3-lobed, a little sh'er than sta; ova many-ovuled. —Ubi. It would be difficult to exaggerate the beauty of this plant, as it is seen growing in rounded masses, with the many-shaded large blossoms crowded towards the ends of the branches; unfortunately, as it was just coming into bloom, no sd could be obtained. It appears to be very local, having been observed during an hour's journey, & not again met with."—Br 2:184 t 9.

PHACELIA SCARIOSA Br 2:185.

"Euphacelia. Ann, erect, branching from base, villous-pubescent & glandular: lvs 2-3 in lg, petiolate, pinnately divided into 3-5 ovate-oblg, crenate or incised lobes, the terminal much the largest: racemes open, elongate, oft dichotomous: pedicels filiform, villous 3-5 mm lg, deflexed in fr: cx villous, 2-3 mm lg, the broadly-obovate lobes cleft to base, becoming conspicuously enlarged & thin-scarious in fr: cor bright blue with w throat, twice as lg as cx, the rotate limb as lg as throat; appendages uniting below over the fil, which are moderately exserted: sty cleft 1-third its length, the lower third & the ova pubescent: cap globular, less than half as lg as fr'g cx: sds dull, minutely fovose-reticulated, margins and central ridge corrugate. — Magdalena Island." — Br 2:185.

IPOMOEA JICAMA Br 2:188.

"Per, glab, somewhat twining, with num slender sts, prostrate or climbing 4-6 ft hi in bushes: rts bearing tuberiform juicy swellings 2-4 in in diam: lvs ovate-acuminate, cordate at base, entire, angulate or sinuate-dentate, 30 mm lg & broad on petioles as lg: ped solitary, 20-50 mm lg with a pair of very unequal bracts near middle: cx-lobes oblg-ovate, lg-apiculate, the inner 15 mm lg, the outer successively sh'er: cor funnelform, w changing to p in fading, 60-80 mm lg, tube a little lg'er than cx: stig 2-globose, lobulated: cap 4-sd'ed, sds somewhat rounded densely covered with dark brown pubescence. Magdalena & S Margarita Isl. SJorge."—Br 2:188.

CUSCUTA VEATCHII Br 2:189.

"Sts slender, branching; scales few & sm; fls few in the clusters, sm; cx nar'ly campanulate at base, with ovate-lanceolate lobes: cor 3 mm lg, twice as lg as cx, its slender lobes, as well as those of the latter denticulate on the margin & somewhat reflexed-spreading: fil sh'er that sta, attached just below sinus; appendages broad, nearly as lg as tube, fimbriate above: sty 2, sh, stout, unequal; stig globular; ovules 4, only 1 apparently ever maturing: sd globular; embryo large, solid, globose, minutely

(To be continued.)

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EDIBLE AND POISONOUS FUNGI

(The following is from the annual report of the state botanist of New York, 1894, by Charles H. Peck.)

*** Many who would gladly avail themselves of the agreeable and highly nutritious food afforded by our edible fungi are debarred from doing so by a lack of the knowledge necessary for a proper discrimination between the edible and the poisonous or worthless species. With this knowledge, the fear of the bad would no longer prevent the use of the good. With it many whose circumstances are such as to make it difficult or impossible to secure an adequate supply of animal food might often obtain a very good substitute for it by the slight labor of gathering it in the fields and woods.

European works on the subject are less satisfactory, because the species in this country are not wholly the same as in that. Some of them are not readily procurable because of their high price, others and cheaper ones are less desirable because of deficiency in th number or character of their illustrations.

*** A compound microscope and a micrometer are necessary to ascertain the shape and size of the spore.

* * * * *

That there are dangerous species whose use as food should be most carefully avoided is an acknowledged fact, but the number of such species is far less than many suppose. According to the authority of those who have especially investigated this subject, the dangerously poisonous species found in this country all belong to a single genus, Amanita. About a dozen species of this genus have been found in our state, and of these, two are known to be harmless and edible, three or four only are commonly classed as poisonous, and probably a single one of these is responsable for a vast majortiy of the fatal accidents resulting from "mushroom poisoning." There are, however, some species in other genera that are capable of causing nausea, vomiting and derangement of the digestive organs. They are unwholesome because of their persistently bitter, acrid or otherwise disagreeable flavor, or because of toughness of texture or the possession of some quality repugnant to the stomach. They may indeed cause sickness and vomiting, but the irritation they induce is soon apparent and quickly causes the rejection from the system of the offending substance and then the normal condition of the system is soon restored. Sometimes recovery in such cases may be hastened by the administration of some simple emetic which will assist the stomach in its efforts to expel the unwholesome material.

The dangerous species do not appear to possess such irritating qualities. The symptoms of sickness do not appear till several hours after eating, generally eight to fifteen. Then the face exhibits an ashy paleness, there is distress in the region of the stomach, resulting in nausea, vomiting and relaxation of the bowels, the extremities become cold, the pulse feeble, the sight affected, and finally stupor and death follow if relief *is* not obtained. To this kind of poisoning, atropine, the active principle of Atropa belladonna, has been found to be an antidote. It has been administered in the doses of one-180th to one-90 of a grain according to the severity of the case, and the dose may be repeated if necessary. It should be administered in subcutaneous injections.

For two thousand years or more people have made use of mushrooms for food and from time to time death has resulted from their use, either through ignorance or carelessness. Still men persist in their use, and those who would use them if they dared frequently ask how they may distinguish mushrooms from toadstools, the word "toadstools" indicating them to be poisonous or harmful species. Many attempts have been made to answer this question and many rules have been formulated by the observance of which, it has been claimed, all difficulty and danger would be avoided.