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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME 43
1930



WASHINGTON
PRINTED FOR THE SOCIETY

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PUBLICATION NOTE

By a change in the By-Laws of the Biological Society of Washington, effective March 27, 1926, the fiscal year now begins in May, and the officers will henceforth hold office from May to May. This, however, will make no change in the volumes of the Proceedings, which will continue to coincide with the calendar year. In order to furnish desired information, the title page of the current volume and the list of newly elected officers and committees will hereafter be published soon after the annual election in May.

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(FOR 1930-1931)

(ELECTED MAY 3, 1930)

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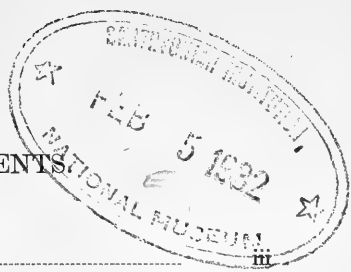


TABLE OF CONTENTS

Officers and Committees for 1930-1931.....	iii
Proceedings for 1930.....	vii-xi
A New Pigeon from Siam, by H. B. Conover.....	1-2
A New Species of Francolin from Southern Abyssinia, by H. B. Conover.....	3-4
A New Polygala from Colombia and Bolivia, by S. F. Blake.....	5-6
A New Hummingbird from St. Andrews Island, Caribbean Sea, by Alexander Wetmore.....	7-8
New Species of Haliphus Latr. (Col.), by Edward A. Chapin.....	9-12
Records of the Wood Tortoise (<i>Clemmys Insculpta</i>) in the vicinity of the District of Columbia, by Austin H. Clark.....	13-16
An Interesting New Genus of Iceryine Coccid, by Harold Morrison.....	17-20
Seventh Supplement to the Flora of the District of Columbia and Vicinity, by W. L. McAtee.....	21-54
Notes on Some Amphibians in Western North America, by George S. Myers.....	55-64
Fishes from the Upper Rio Meta Basin, Colombia, by George S. Myers.....	65-72
The Status of the Southern California Toad, <i>Bufo californicus</i> (Camp), by George S. Myers.....	73-78
Two New Forms of Laughing Thrushes from Yunnan, by J. H. Riley.....	79-80
Fern Miscellany, by William R. Maxon.....	81-88
Fifteen New Species of Grasses, Six from Africa, Nine from China, by A. S. Hitchcock.....	89-96
The Washington Species of <i>Draba</i> , by Edwin Blake Payson and Harold St. John.....	97-122
A New Species of <i>Fulvetta</i> from Yunnan, China, by J. H. Riley.....	123-124
Two New Generic Names and Three New Species of Mallophaga, by H. E. Ewing.....	125-128
The Sonora Races of <i>Camptostoma</i> and <i>Platypsaris</i> , by A. J. van Rossem.....	129-132
Four New Forms of Birds from Szechwan, China, by J. H. Riley.....	133-136
On Fifteen New North American Spiders, by Ralph V. Chamberlin and Willis J. Gertsch.....	137-144
Notes on Tropical American Fishes, by Henry W. Fowler.....	145-148
The Ground-Dove of Navassa Island, by Alexander Wetmore.....	149-150
Another New Subspecies of <i>Nannus troglodytes</i> from Alaska, by Harry C. Oberholser.....	151-152

Two New Foxes from the Southern California Islands, by J. Grinnell and J. M. Linsdale.....	153-156
A New <i>Banisteria</i> from Brazil and British Guiana, by C. V. Morton.....	157-160
A New <i>Polygala</i> from Bermuda, by S. F. Blake.....	161-162
Two New Asteraceae from Mexico Collected by Georges Wornow, by S. F. Blake.....	163-166
Ferns of the Republic of Salvador, by William R. Maxon and Paul C. Standley.....	167-178
Aphid Homonyms, by F. C. Hottes.....	179-184
The Name <i>Cinara Versus</i> the Name <i>Lachnus</i> , by F. C. Hottes....	185-188
Descriptions of Three New Birds from Siam, by J. H. Riley.....	189-192
On a New Species of Brook Silverside, <i>Labidesthes vanhyningi</i> , from Florida, by Barton A. Bean and Earl D. Reid.....	193-194
A New Species of <i>Pleurothallis</i> from Mexico, by Oakes Ames and Charles Schweinfurth.....	195-196

The Committee on Publications declares that each paper of this volume was distributed on the date indicated on its initial page. The index and minutes of proceedings for 1930 (pp. vii-xi; 197-204) were issued on February 21, 1931. The title and lists of officers and committees for 1930-1931 (pp. i-iv) were issued on July 18, 1930.

ERRATA.

- Page 18, lines 13 and 15, for *Echinicerya anomola* read *Echinicerya anomala*.
 Page 54, line 26, for *Drosera fliformis* read *Drosera filiformis*.
 Page 61, last line of note, for MDCCCXXI read MDCCCXXXI.

PLATES.

- I. Facing p. 18. Anatomical details of *Echinicerya anomala*.
 II, III. Facing p. 140. Palpi, etc., of species of *Phruronellus*.
 IV. Facing p. 141. Palpi, etc., of species of *Phrurolithus*.
 V. Facing p. 141. Palpi of species of *Phrurolithus* and *Agelena*.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS.

The Society meets from October to May, on alternate Saturdays, at 8 P. M. All meetings during 1930 were held in the new lecture hall of the Cosmos Club.

January 11, 1930—742d Meeting.¹

President Wetmore in the chair; 65 persons present.

The President announced the reappointment of T. S. Palmer as Chairman of the Board of Trustees of Permanent Funds through 1932.

A resolution by the Council commending the zoological work of C. Davies Sherborn was read.

Informal communications: A. Wetmore, Receipt of skins of giant panda at the National Museum; F. C. Lincoln, Returns from banded ducks; P. B. Johnson, Note on the hairs on the lip of the hippopotamus.

Formal communications: W. H. Rich, Alaska salmon investigations; O. E. Sette, Mackerel investigations; E. Higgins, Great Lakes investigations.

January 25, 1930—743d Meeting.²

President Wetmore in chair; 80 persons present.

New members elected: E. A. Moran, S. F. Stanley.

Informal communication: A. A. Doolittle, Exhibition of plants growing in hermetically sealed jars.

Formal communications: E. M. Munns, Some forestry obser-

¹Abstract in Journ. Washington Acad. Sci., vol. 20, pp. 346-349, August 19, 1930.

²Abstract in Journ. Washington Acad. Sci., vol. 20, p. 349, August 19, 1930.

vations in Europe; P. N. Martindale, Intimate habits of wild animals.

February 8, 1930—744th Meeting.¹

President Wetmore in the chair; 120 persons present.

New members elected: Henry O'Malley, J. E. Shillinger.

Informal communications: F. Thone, Exhibition of photographs of the skull of *Sinanthropus pekinensis*; P. B. Johnson, Further note on the hairs on the lip of the hippopotamus.

Formal communication: H. M. Albright, Some biological problems in National Park administration.

February 22, 1930—745th Meeting.²

President Wetmore in the chair; 50 persons present.

New member elected: M. C. James.

Informal communications: T. S. Palmer, Comparison of our knowledge of biology with that of 200 years ago, and Note on feeding of quail by police; A. Wetmore, Note on observation of mated ducks; F. C. Lincoln, Note on banding of ducks.

Formal communications: A. H. Wiebe, Some observations in increasing pond productivity; F. A. Warren, Along the trails of Mt. Rainier; C. D. Marsh, The poisonous laurel.

March 8, 1930—746th Meeting.³

Vice-President Jackson in the chair; 72 persons present.

New member elected: F. C. Friesner.

Informal communication: S. F. Blake, Note on the observation of gulls on the Washington Airport field.

Formal communications: H. S. Peters, External parasites of birds; P. Bartsch, Collecting in the Caribbean Islands.

March 22, 1930—747th Meeting.⁴

President Wetmore in the chair; 130 persons present.

New member elected: C. V. Morton.

Formal communications: V. Bailey, Some biological problems

¹Abstract in Journ. Washington Acad. Sci., vol. 20, p. 349, August 19, 1930.

²Abstract in Journ. Washington Acad. Sci., vol. 20, pp. 349-351, August 19, 1930.

³Abstract in Journ. Washington Acad. Sci., vol. 20, p. 351, August 19, 1930.

⁴Abstract in Journ. Washington Acad. Sci., vol. 20, p. 352, August 19, 1930.

of the Grand Canyon region; E. P. Killip, over the Peruvian Andes and down the Amazon for plants.

April 5, 1930—748th Meeting.¹

President Wetmore in the chair; 95 persons present.

Informal communications: S. F. Blake, Note on the persistent greenness of grass on large ant hills; A. Wetmore, Note on the limits to be ascribed to the "Washington Region."

Formal communication: P. G. Reddington, Alaska and some of her interesting inhabitants.

April 19, 1930—749th Meeting.²

Vice-President Stiles in the chair; 55 persons present.

New member elected: W. L. Brown.

Informal communication: G. W. Field, Note on the pollution by oil of wild bird reservations.

Formal communications: H. L. Westover, Plant explorations in Turkestan; O. Schreiner, Biological science in the East Indies.

May 3, 1930—750th Meeting.³

51st Annual Meeting.

Vice-President Jackson in the chair; 11 persons present.

The annual reports of the Recording Secretary, Corresponding Secretary, and Treasurer were presented.

The following officers and members of Council were elected: *President*, A. Wetmore; *Vice-Presidents*, C. E. Chambliss, H. H. T. Jackson, C. W. Stiles, T. E. Snyder; *Recording Secretary*, S. F. Blake; *Corresponding Secretary*, W. H. White; *Treasurer*, F. C. Lincoln; *Members of Council*, H. C. Fuller, W. R. Maxon, A. A. Doolittle, I. Hoffman, E. P. Walker.

October 18, 1930—751st Meeting.⁴

President Wetmore in the chair; 38 persons present.

Informal communications: A. Wetmore, Observation of

¹Abstract in Journ. Washington Acad. Sci., vol. 20, p. 353, August 19, 1930.

²Abstract in Journ. Washington Acad. Sci., vol. 20, pp. 353-354, August 19, 1930.

³Abstract in Journ. Washington Acad. Sci., vol. 20, p. 354, August 19, 1930.

⁴Abstract to appear in Journ. Washington Acad. Sci.

Forster tern in Maryland; H. Ball, Capture of a Baird sandpiper at Alexander Island, Virginia; S. F. Blake, Note on the domestic turkey.

Formal communications: A. Wetmore, The International Ornithological Congress; L. M. Estebrooke, The Inter-American Conference on Agriculture; Watson Davis, Recent biological literature; A. S. Hitchcock, Nomenclature at the International Botanical Congress.

November 1, 1930—752d Meeting.¹

President Wetmore in the chair; 78 persons present.

New members elected: A. V. Smith, Mrs. Viola S. Snyder.

Informal communications: T. S. Palmer, Note on recent ornithological meetings, and Note on the lifting of the embargo on parrots.

Formal communications: W. L. Schmitt, Exhibition of a rare isopod; J. I. Hambleton, The behavior of the honey bee; H. C. Bryant, Fancy and fact in natural history; J. W. Spencer, Observations on Colorado elk herds.

November 15, 1930—753d Meeting.²

President Wetmore in the chair; 115 persons present.

New member elected: Mrs. Judson D. Cobb.

Formal communications: F. G. Ashbrook, Fur farming in Europe; Melbourne Ward, Natural history of the Barrier Reef of Australia.

November 29, 1930—754th Meeting.³

President Wetmore in the chair; 165 persons present.

New members elected: E. P. Cheatum, H. W. Graham, Robert Overing.

Informal communication: A. Wetmore, Note on the new reptile house at the Zoological Park.

Formal communications: H. M. Smith, Some new and curious Siamese fishes; G. M. Dyott, Motion pictures of jungle life.

¹Abstract to appear in Journ. Washington Acad. Sci.

²Abstract to appear in Journ. Washington Acad. Sci.

³Abstract to appear in Journ. Washington Acad. Sci.

December 13, 1930—755th Meeting.¹

President Wetmore in the chair; 125 persons present.

The President announced the election of W. R. Maxon as a member of the Board of Trustees of Permanent Funds.

Informal communication: A. Wetmore, Results of recent study of Pleistocene bird remains from Florida.

Formal communications: Melbourne Ward, Wanderings in North Australia; C. W. Stiles, Is international zoological nomenclature practicable? Report on Padua Congress.

¹Abstract to appear in Journ. Washington Acad. Sci.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW PIGEON FROM SIAM.

BY H. B. CONOVER.



In a small shipment of birds from Siam, received by the author a few weeks ago, were two specimens of *Ducula badia* which seem to represent a new race, which may be known as

Ducula badia obscurata, subsp. nov.

Type from Krat, southeastern Siam, No. 7376, adult male in the Conover Collection, Field Museum of Natural History. Collected October 16, 1928, by C. F. Aagaard.

Characters.—Differs from all previously known races of *Ducula badia* by having the top of the head and the cheeks much darker vinaceous, and the underparts of the body much darker gray with practically no vinaceous tinge.

Differs from *D. b. badia* by having the upper back and wing coverts much less purplish chestnut; the lower back and rump lighter, more grayish, less brownish; the mantle, top and sides of the head darker vinaceous; and the underparts much darker gray with practically no vinaceous tinge. The dividing line between the colors of the mantle and back is also much less pronounced.

Differs from *D. b. insignis* by having the lower back and rump darker, more brownish, less grayish; the mantle, top and sides of the head darker vinaceous; the underparts, including the under wing coverts, much darker sooty gray; and the upper back and wing coverts darker vinaceous.

Differs from *D. b. cuprea* by having the back and upper wing coverts purplish, not brown; the lower back and rump darker; the mantle, top and sides of the head much darker vinaceous; and the underparts much darker gray with practically no vinaceous tinge. The under wing coverts also are darker gray.

Differs from *D. b. griseicapilla* by having the top and sides of the head vinaceous, not gray; the upper back darker vinaceous; the lower back and rump darker gray; and the underside of the body and under wing coverts much darker sooty gray.

Description.—Top of the head, cheeks, back and sides of the neck, and

mantle rather dark vinaceous. Upper back and upper wing coverts dark purplish vinaceous. Lower back, rump and remainder of wings dark brownish gray. Tail black with a broad gray band at tip. Throat white. Rest of underparts of body, including under wing coverts, sooty gray, with a slight vinaceous tinge on crop and upper breast. Under tail coverts buffy white. Wing (flat) 236, tail 82, culmen (exposed) 21, tarsus 27, middle toe (with claw) 43 mm.

I have seen four specimens of this new race including the type. Two of these are in my own collection and two in that of the Field Museum. All are alike. Besides these four there is a specimen in the Field Museum from Chantaboon, Siam, which I have referred to this race. This specimen is not quite typical, however, although Mt. Chantaboon is only about 75 miles from Krat. It is lighter throughout than the other four specimens, having a tendency toward the coloration of *D. b. griseicapilla*, but differs from that race by having a darker gray breast with much less vinaceous, and the top of the head and cheeks vinaceous, not gray.

Specimens Examined:

Ducula badia badia.—N. Borneo: Kina Balu 1 ♂⁴.

Ducula badia insignis.—Sikhim: 1 ♂¹.

Ducula badia cuprea.—India: Williamspath Hills 2 ♂³.

Ducula badia griseicapilla.—Siam: MeTaqua Rahend 1 ♂⁴; Chieng-Mai 1 ♀⁵; Un Pang 1 ♂, 1 ♀³. S. Annam: Dalat 1 ♂⁴. Laos: Phong Saly 4 ♂, 3 ♀²; Pyn Ho 1 ♂, 1 ♀². Tenasserim: Taok Plateau 1 ♀³.

Ducula badia obscurata.—Siam: Krat 2 ♂, 2 ♀¹⁻²; Chantaboon 1 ♀².

I wish to thank the officials of the following institutions for the loan of specimens necessary for this investigation: Field Museum of Natural History, Chicago; American Museum of Natural History, New York; United States National Museum, Washington, D. C.; Academy of Natural Sciences, Philadelphia. I am also indebted to Prof. Oscar Neumann of Berlin for calling my attention to the characters of this race.

¹Specimens in Conover Collection, Field Museum, Chicago.

²Specimens in Field Museum, Chicago.

³Specimens in American Museum, New York.

⁴Specimens in U. S. National Museum, Washington, D. C.

⁵Specimens in Academy of Natural Sciences, Philadelphia.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



A NEW SPECIES OF FRANCOLIN FROM SOUTHERN
ABYSSINIA.

BY H. B. CONOVER.

The recent Harold White-John Coats Field Museum Abyssinian Expedition brought to the Field Museum a small collection of birds from Abyssinia. Among these was one specimen of a Francolin which has proved to belong to a new species. It is very different from any previously described, but probably is most closely related to *Francolinus castaneicollis*. However, it is a very plain colored bird, lacking the rufous markings of that species.

I have been given the opportunity of describing this species through the kindness of the Director of the Field Museum and the members of its zoological staff.

According to the collector, C. J. Albrecht, the bird was taken at Mega, which is an isolated forested mountain about 7000 feet high; and subject at the time of their visit to heavy mists. The trees were said to be moss grown, indicating moist conditions, although the surrounding region is not very well watered.

***Francolinus atrifrons*, spec. nov.**

Type from Mega, Boran, Abyssinia, el. 7000' (about 70 miles northwest of Moyale, Kenya Colony) No. 67455, adult male in the collection of Field Museum of Natural History, Chicago, collected May 31, 1929, by C. J. Albrecht.

Characters.—A large double-spurred Francolin with red legs and bill. Probably most nearly allied to *Francolinus castaneicollis*, but without any trace of the rufous markings; a very plain colored bird.

Description.—Forehead and superciliary stripe black. Top of the head dull brown, the feathers with slightly paler edges. Feathers of the back and sides of the neck dull brown, widely bordered with brownish white. Mantle and upper back fuscous black, each feather with 2 whitish V-shaped

markings, one submarginal and the other subcentral, the latter more strongly tinged with buffy. Wing coverts hair brown, speckled with black and with whitish markings as on the mantle. Lower back, rump and upper tail coverts olivaceous brown mottled with fuscous black and with narrow shaft lines of the same color. The feathers edged with dingy white, these becoming obsolete on the upper tail coverts. Central tail feathers dark buffy brown, vermiculated with dusky and with narrow dusky shaft streaks. Outer tail feathers dusky brown, vermiculated on the outer web with buffy. Primaries hair brown, the outer ones indistinctly edged with ashy gray. Secondaries brown, the outermost with a submarginal stripe of dull whitish and a few irregular freckles of the same color, the latter increasing in amount toward the innermost secondaries, where they form a second parallel stripe. A narrow line of black along the upper edge of the gape. Lores and cheeks buffy white, each feather with a black tip giving a speckled appearance. Auriculars dull brown. Feathers in front, underneath and behind the auriculars slightly tinged with rusty. Throat pale vinaceous buff. Feathers of the foreneck the same with conspicuous V-shaped centers of dull brown. Lower neck and upper breast similar but with central markings becoming obsolete or at least not sharply defined, giving the feathers a slightly brownish appearance. Remainder of underparts the color of the throat. Under tail coverts with dark brown shaft stripes. Flanks with dusky shaft stripes and vermiculations. Outer side of the thighs dark brown. Wing lining uniform brown. Bill and feet red. Wing (flat) 206, tail 128, culmen (exposed) 30, tarsus 58, middle toe (with claw) 58 mm.

All specimens examined are in the Field Museum, Chicago.

Specimens examined:

Francolinus castaneicollis botlegi.—Abyssinia: Mt. Albasso 5 ♂, 6 ♀; Mt.

Kaka 3 ♂, 3 ♀; Arbigona Village 1 ♂, 1 ♀; Webbi River 1 ♀.

Francolinus atrifrons.—Abyssinia: Mega 1 ♂.

PROCEEDINGS
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BIOLOGICAL SOCIETY OF WASHINGTON



A NEW POLYGALA FROM COLOMBIA AND BOLIVIA

BY S. F. BLAKE.

The description of *Polygala gracilis* H. B. K. published by the writer¹ in 1916 was based at least in part on a confusion of true *P. gracilis* with a closely allied, hitherto unnamed species. The matter is only imperfectly straightened out by corrections made in proof in the description of the same species in my later treatment² of the North American species of *Polygala*. The new species may be described as follows:

***Polygala macerrima* Blake, sp. nov.**

Slender annual, glabrous throughout; leaves alternate, linear, mostly deciduous at anthesis, those of the branches filiform-subulate; racemes elongate, acute; bracts deciduous; flowers "rose purple" or "violet pink," pedicellate, the pedicels wide-spreading or deflexed in fruit; crest multifid; capsule equaling or somewhat longer than wings, oval, about 1.8 mm. long; aril 2-lobed, about one-third as long as the pilose seed.

Stem solitary, erect, 40-80 cm. high, usually with several erect branches; leaves scattered, those of the main stem linear, 1-1.8 cm. long, 0.5-0.8 mm. wide, acuminate, flattish, 1-nerved, erectish, those of the branches erect, 1-5 mm. long; peduncles terminating stem and branches, 1 cm. long or less; racemes slenderly cylindric, 2.5-8 cm. long (the axis becoming 26 cm. long or less), 4-6.5 mm. thick, dense or rarely loose, scarcely or not comose at apex; bracts rhombic-ovate, long-acuminate, about 1.3 mm. long, the body erose-denticulate; pedicels 0.8-1.2 mm. long; upper sepal oval, 1.2 mm. long, erose at the rounded apex, 1-nerved; lower sepals similar but narrower, oval-oblong; wings elliptic-obovate, 2-2.2 mm. long, 0.8-1 mm. wide, rounded at apex, 3-nerved; upper petal obliquely oblong-ovate, slightly erose toward the blunt apex, about 5-nerved, 2.2-2.5 mm. long; keel 2.5-2.8 mm. long, the crest on each side of a triangular sometimes 2-lobed lamella and 2 segments deeply 2-3-parted into linear lobes; free filaments of the lateral stamens about equaling the anthers; seed oblong-

¹Contr. Gray Herb. 47: 99. 1916.

²N. Amer. Fl. 25: 348. 1924.

ellipsoid, obtuse at each end, 1.4–1.7 mm. long; aril 0.3–0.6 mm. long, its 2 lobes oblong, obtuse.

COLOMBIA: Ibagué, 18 Jan. 1853, *Holton* 827 (N. Y. Bot. Gard.); in prairie, Mariquita, Dept. Tolima, 250–300 m., 16 July 1917, *F. W. Pennell & H. H. Rusby* 72 (U. S., N. Y. Bot. Gard.); same locality, 7 Jan. 1918, *Pennell* 3677 (TYPE No. 1,043,766, U. S. Nat. Herb.; dupl. in herb. N. Y. Bot. Gard.); open springy soil, west of San Lorenzo, Dept. Tolima, 600–800 m., 30 Dec. 1917, *Pennell* 3534 (N. Y. Bot. Gard.); dry open hills, Pavas, Dept. El Valle, 1500–1700 m., 24–29 Sept. 1922, *E. P. Killip* 11668 (U. S.).

BOLIVIA: Ixiamas, 28 Dec. 1901, *R. S. Williams* 271 (N. Y. Bot. Gard.); Ixiamas, alt. 245 m., 21 Dec. 1921, *O. E. White* (Mulford Biol. Expl. 2321; N. Y. Bot. Gard.).

In the closely similar *P. gracilis* H. B. K. the raceme axis is finely pubescent, the pedicels in fruit are erect or erectish, and the capsule is noticeably shorter than the wings. Fragments of both species were sent to the herbaria at Paris and Berlin, and compared with the original material of *P. gracilis* by Dr. R. Benoist and Dr. J. Mattfeld. The following specimens are referable to *P. gracilis* H. B. K.

CHIAPAS: 1864, *Ghiesbreght* 861 (Gray Herb.).

NICARAGUA: Grenada, 1868, *Flint* (U. S.).

PANAMA: Chivi Chivi, 1917, *Killip* 3128 (U. S.).

COLOMBIA: Dept. Cundinamarca, 1917, *Pennell* 1809 (U. S., N. Y. Bot. Gard.); Dept. El Cauca, 1922, *Pennell & Killip* 8181 (U. S.).

VENEZUELA: Near Colonia Tovar, *Fendler* 235 (N. Y. Bot. Gard.); La Trinidad de Maracay, Aragua, 440 m., 1913, *Pittier* 5845 (U. S.); Silla de Caracas, 1874, *Kuntze* 1604 (N. Y. Bot. Gard.; det. as *P. paniculata* var. *ambigua* by Kuntze).

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



A NEW HUMMINGBIRD FROM ST. ANDREWS ISLAND,
CARIBBEAN SEA.

BY ALEXANDER WETMORE.¹

Among birds collected on Caribbean Islands by Dr. A. K. Fisher through the interest of the Honorable Gifford Pinchot, during the Pinchot Expedition of 1929, there is a hummingbird from St. Andrews Island that proves to be new to science. Pending publication of a complete report on the entire collection, now in preparation, this new form is here described as

***Anthracothorax violicauda pinchoti*, subsp. nov.**

Characters.—Similar to *Anthracothorax violicauda violicauda* (Boddaert)² but male with black of throat and breast restricted, bordered by metallic green instead of blue on sides of throat and upper foreneck.

Description.—Type, U. S. Nat. Mus. No. 313803, male, collected on St. Andrews Island, Caribbean Sea, April 27, 1929, by A. K. Fisher. Above metallic bronze-green, duller, less metallic on crown; wings dull black; middle pair of rectrices dull black slightly glossed with bronze; outer rectrices deep maroon-chestnut, glossed with metallic purple, margined all around with dark metallic greenish blue, this band narrow and nearly obsolete on outer feathers, and broader internally; chin, breast and abdomen dull black, upper breast glossed with bronzy greenish blue; sides metallic bronze-green, under tail-coverts blackish, washed with metallic green, femoral and lumbar tufts white. Bill and feet dull black (from dried skin).

Measurements.—2 males, wing 65.9³–69.5 (67.7), tail 36.1³–37.8 (37.0), culmen 24.8³ mm.

Range.—Known only from St. Andrews Island, Caribbean Sea.

Remarks.—The allocation of the hummers of this group from St. Andrews Island to the typical form of *Anthracothorax violicauda* of the distant mainland has long seemed anomalous so that in examination of the single

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²*Trochilus violicauda* Boddaert, Tabl. Planch. Enl., 1783, p. 41. (Cayenne.)

³Type specimen.

skin obtained by the Pinchot expedition careful comparison has been made with a long series of the typical bird. A second specimen from St. Andrews collected May 1, 1887, by W. L. Abbott has been available through loan from the Academy of Natural Sciences. From these two specimens the differences indicated above have been evident. The type of *pinchoti* which is not quite adult differs from the Abbott skin (which has a broken bill) principally in being greener above and in having the black of the breast somewhat more obscured by greenish. This insular race seems to have carried to an extreme the differences that distinguish *Anthracothonax v. iridescens* of western Ecuador.

It is a pleasure to name this new race in honor of Gifford Pinchot.

574-0673

PROCEEDINGS
OF THE
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NEW SPECIES OF HALIPLUS LATR. (COL.).

BY EDWARD A. CHAPIN.

In arranging the National collection of beetles of the family Haliplidae four species were encountered that appear to be undescribed. These are characterized below and the position of each in the system as formulated by Alois Zimmermann in *Entomologische Blätter*, Vol. 20, 1924, is indicated.

Haliphus philippinus, n. sp.

Nearest to *H. ferrugineipes* Regimbart. Reddish-yellow with piceous maculation. Form elliptical, greatest width at basal third of elytra which are obliquely truncate at apices, margin of truncature entire. Head very sparsely and finely punctured, front not broad. Pronotum more than twice as wide as long (length-width ratio, 10:25), with the anterior margin angularly produced medianly, the apex of the angulation in advance of the anterior lateral angles, surface moderately coarsely but sparsely punctured. The punctures near the basal margin are arranged roughly in two transverse rows which tend to bound the slightly depressed basal portion. Near each posterior lateral angle there are three or four very coarse and subconfluent punctures. Elytra with the punctures of the primary rows only slightly coarser than those of the secondary rows; on apical half it is hardly possible to trace the individual rows of either series. Punctures of lateral rows more coarse than those of dorsal rows, epipleura with two rows of very coarse punctures on basal half, the inner of which is continued onto the apical half as a row of very fine punctures while the outer row extends onto the apical half for some distance without material reduction in size of individual punctures. Prosternum almost parallel-sided, slightly constricted just before the coxae, strongly margined, with three poorly defined longitudinal rows of punctures. Metasternal process with a deep oval pit on either side, otherwise with about a dozen fine punctures. Posterior coxal plates coarsely and sparsely punctured.

Maculation as follows: pronotum with an ill-defined dark spot at middle of anterior margin (sometimes absent); elytra with suture and base for a short distance either side of the scutellum dark, also with an isolated spot

at apical third, situated equi-distant from suture and lateral margin. The sutural vitta is expanded at the middle of its length into a rectangular spot which is of indefinite extent apically but which is well defined basally and which constantly bears a lateral comma-shaped outgrowth at each basal angle.

Length: 2.5-2.8 mm.

Type and eight paratypes, U. S. N. M. No. 41757, from Bacoor, Manila, Philippine Ids., P. L. Stangl, collector. Type a male, paratypes a male and seven females.

Runs without difficulty to group 6, section 2, of Zimmermann's key and takes its place beside *H. ferrugineipes* Rég. from New Guinea. It is distinguished from this last-mentioned species by the coarse punctures of the secondary rows on the elytra.

***Haliphus cubensis*, n. sp.**

Nearest to *H. ornatipennis* Zimmermann. Pale castaneous, pronotum and elytra with piceous maculations. Form broadly oval, widest at basal third of elytra, elytra acuminate, obliquely truncate at apices, truncature finely margined but entire. Head rather sparsely but distinctly punctured, front moderately broad. Pronotum more than twice as wide as long (length-width ratio, 10:23), with anterior margin very slightly angulated at middle, anterior angles acute, well in advance of median angulation, surface coarsely and moderately densely punctured on disc, sparsely punctured laterally, punctures along basal margin more coarse and arranged in a line. Elytra with the usual ten primary rows of punctures, the punctures of the sutural rows much finer than those of the three lateral rows. The punctures of the first secondary row almost as large as those of the first primary and evenly distributed throughout the length of the elytron. Other secondary rows incomplete, especially in apical half. Basal half of epipleura with two rows of very coarse punctures, apical half with one row of fine punctures situated close to inner margin. Prosternum almost parallel-sided, just perceptibly widened in front, lateral margins thickened, median line slightly raised and impunctate. Metasternal process with a round pit on either side, otherwise impunctate. Posterior coxal plates coarsely and sparsely punctured.

Maculation as follows: anterior and posterior margins of pronotum darker in median half, the two color masses tending to coalesce along the median line; basal and sutural margins of elytra dark, the sutural vitta expanded at middle and before apex. The median expansion is roughly pentagonal (angle of pentagon on suture directed toward apex) and at each basal angle it gives off a broad process which in turn connects with an ill-defined subhumeral spot. The subapical expansion joins at its basal end an elongate spot. There are also on each elytron two sublateral spots, one at apical third and one in the angle between the lateral margin and the apical truncature.

Length: 2.5 mm.

Type and paratype, U. S. N. M. No. 41758, from Cayamas, Cuba, May 11, E. A. Schwarz, collector.

In Zimmermann's key this species fits best into group 9, section 1. It appears to have much in common with *H. ornatipennis* Zimm., the only species of this section known up to the present. The species may be separated by the shape of the metasternal pits (here round and not at all elongate) and by the absence, in *H. cubensis*, of serration of the lateral margins of the elytra.

***Haliphus panamanus*, n. sp.**

Nearest to *H. obconicus* Régimbart. Reddish-yellow, pronotum and elytra with piceous maculations. Form broadly oval, widest at basal third of elytra, elytra with apical truncature not sharply set off from lateral margin, margins entire. Head finely punctate, densely on front, sparsely on vertex. Front rather narrow. Pronotum more than twice as broad as long (length-width ratio 11:26), anterior margin with a feeble median angulation, lateral portions densely and moderately coarsely punctured, median area with finer and more sparsely set punctures. Elytra with punctures of primary rows coarse and subequal throughout the length of the rows, tenth row not very much coarser than ninth. First secondary row very irregular on basal half, second secondary row uniform throughout its length, composed of fine but distinct punctures. Basal half of epipleura with two rows of coarse punctures, the inner of which is represented on the apical half by two or three coarse, widely separated punctures. Prosteronum strongly widened anteriorly, finely and densely punctured, slightly tumid along the median line. Metasternal process with two large sub-circular pits on either side of the median line. Posterior coxal plates coarsely and rather densely punctured.

Maculation as follows: on the pronotum a single small roundish spot at middle of anterior margin; on elytra five small spots on each and three larger spots along suture in apical half which are mutually connected. The location of the small spots may be indicated thus: at base a small spot lying between the third and fifth primary rows; at basal fourth two spots, the one nearer the suture slightly behind the other, the one between the second and fourth, the other between the fifth and seventh primary rows. The inner of the spots is connected by a narrow line of color with the first and largest of the common sutural spots; slightly postmedian and between the fifth and seventh primary rows is a spot and at apical fourth a spot between the third and fourth primary rows which nearly touches the second of the sutural spots. The basal half of the suture is also very narrowly dark.

Length: 2.8 mm.

Type, U. S. N. M. No. 41759, from Tabernilla, Canal Zone, Panama, July 20, 1907, A. Busck, collector.

Belongs in group 9, section 4 of Zimmermann's system. Its nearest relative is *H. obconicus* Rég. from which it may be distinguished by the nearly uniform size of the punctures throughout the length of the primary rows and by the second secondary row being single and uniform throughout its length.

***Haliphus crassus*, n. sp.**

Nearest to *H. robustus* Sharp. Bright reddish-yellow, pronotum and elytra with piceous maculations. Form broad, very robust, widest just behind the humeri, elytra acuminate, obliquely truncate at apices, truncature finely serrate. Head finely and sparsely (very sparsely on vertex) punctured, front rather narrow. Pronotum more than twice as broad as long (length-width ratio, 16:35), more coarsely and densely punctured than head, especially on the anterior half of the disc, the punctures along the lateral margins coarser than the others. Elytra shining, the punctures forming the outer (lateral) primary rows not more coarse than those of the discal rows and on the apical half the punctures of the primary and secondary rows are of almost the same size. On the basal half the punctures of the primary rows are as usual much coarser than those of the secondaries. First secondary row composed of fine punctures so closely set as to form an almost continuous groove, second secondary row double in basal third, punctures at base of elytra greatly confused. Basal half of epipleura with the usual two rows of very coarse punctures, the apical half with but one (inner) row of very fine punctures. Prosternum broad, almost parallel-sided, closely but not coarsely punctured, lateral longitudinal grooves shallow. Metasternal process finely and densely (especially laterally) punctured. Posterior coxal plates coarsely and rather sparsely punctured.

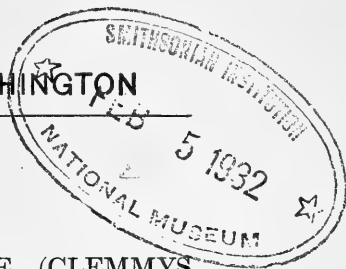
Maculation as follows: anterior two-thirds of disc of pronotum with an irregular dark spot; base of elytra from suture to fifth primary rows and suture dark. Sutural vitta with three expansions, one antemedian, irregular and reaching to the fourth primary row, a second postmedian, touching the third primary row, and a third at apical third reaching the third secondary row. At latitude of the first expansion there is on each elytron an irregular spot lying mainly between the fifth and seventh primary rows, sometimes connected by a narrow isthmus with the sutural expansion. Postmedian, between the fourth secondary row and the seventh primary row there is a bipolar spot connected at its apical end with the basal end of the subapical sutural expansion. Laterally there are two spots on each elytron, one at two-fifths from apex, the other in the angle between the lateral margin and the truncature.

Length: 3.7 mm.

Type, U. S. N. M. No. 41760, a male from Cabima, Panama, May 28, 1911, A. Busck, collector.

Belongs in group 9, section 5, of Zimmermann's key, where it may be differentiated from *H. robustus* Sharp by the absence of longitudinal lines, by the very sharply defined pattern and by the sparse punctuation of the head.

PROCEEDINGS
OF THE
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RECORDS OF THE WOOD TORTOISE (*CLEMMYS*
INSCULPTA) IN THE VICINITY OF THE DISTRICT
OF COLUMBIA.

BY AUSTIN H. CLARK.¹

The wood or sculptured tortoise (*Clemmys insculpta*) reaches the southern limit of its distribution within, and in the immediate vicinity of, the District of Columbia. It is sufficiently uncommon in this region to warrant a detailed list of the captures.

It was first recorded from the vicinity of the District by Mr. Henry W. Henshaw, who took one on the Maryland shore of the Potomac near Plummerville Island on August 19, 1906 (*Proc. Biol. Soc. Washington*, Vol. 20, p. 65, June 12, 1907). This specimen, according to Mr. Henshaw, was presented to the National Museum, but it can not now be located.

About 1908 Mr. Herbert S. Barber found one on Plummerville Island near the upper end which he believes he gave to Mr. William Palmer for the local exhibit in the National Museum. It is not, however, in the Museum collection.

In the album of the Washington Biologists' Field Club at Plummerville Island there is a photograph of a specimen dated April 3, 1910, which is described as the second one found in that locality. Mr. Barber says that, if he remembers correctly, this individual was liberated after being examined at the National Museum, and it, or a very similar one, was seen again the following year.

In 1918 Mr. W. L. McAtee wrote (*Bull. Biol. Soc. Washington*, No. 1, May 17, 1918, p. 45) that this species had been collected several times near Plummerville Island. He referred to the three (or four) mentioned above.

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Mr. Edward A. Preble found a specimen on August 25, 1918, in the valley of Pimmitt Run, Virginia, near the mouth of Little Pimmitt, or about two miles above the mouth of the main run. The head of this individual is in the National Museum (Cat. No. 61095).

In the National Museum collection there is a recently hatched individual (Cat. No. 62556) with the carapace only $1\frac{3}{8}$ inches in length which was collected by Dr. R. W. Shufeldt in the District of Columbia in 1919.

On August 9, 1922, Mr. Preble saw a good sized individual swimming in a pool in Gordon Branch, a tributary of Bullneck Run, just above the place where it crosses the Great Falls pike on the Virginia side of the Potomac. This individual escaped into a labyrinth of roots beneath an overhanging bank.

On June 14, 1925, Mr. Preble saw the remains of another that had been run over and killed on the road near the same place.

A year or two later he found one on his place near Gordon Branch, Virginia. It was in oak woods near the back of the hill. This one was brought to the house and placed in a box with the intention of photographing it and then presenting it to the National Zoological Park. But it was stolen from the box before either intention could be carried out.

In the late spring or early summer of 1928 Mr. Clarence R. Shoemaker captured a specimen on Mineshoe Island in the Potomac about three-quarters of a mile above Cabin John bridge, and just below the first lock above Cabin John.

On June 24, 1928, Mr. Barber found one on the bank of the Potomac near Black Pond on the Virginia shore about three miles from Plummers Island. Like those which he had previously found at Plummers Island, this one was discovered on a recently freshet-swept bank under dense woods. It is now in the National Museum (Cat. No. 76591).

In the summer of 1928 Mr. Kenneth L. Hobbs presented to the National Zoological Park an individual which had been found at Cabin John.

On May 19, 1929, Mr. Hugh U. Clark found an unusually large individual in a small shallow pond which occasionally becomes completely dry situated in open woods 2.5 miles west of Cabin John, a few hundred feet east of the underpass beneath

the canal, and between the canal and the small brook just north of it.

This specimen, a male, gave the following measurements: Length, measured around the dorsal curve of the carapace, $9\frac{1}{8}$ inches; width across the middle of the central scale in the middle row, $7\frac{3}{8}$ inches; circumference in the same place, $14\frac{1}{4}$ inches; length of plastron in the median line, $6\frac{7}{8}$ inches. This example was presented to the National Museum.

SUMMARY OF LOCALITIES.

MARYLAND: Cabin John (H. U. Clark; K. L. Hobbs); Mineshoe I. (C. R. Shoemaker); Plummers I. (H. S. Barber; Washington Biologists' Field Club; W. L. McAtee); shore of the Potomac near Plummers I. (H. W. Henshaw; W. L. McAtee [Mr. McAtee's published statement covers this and the immediately preceding records]).

DISTRICT OF COLUMBIA: D. C. (R. W. Shufeldt).

VIRGINIA: Near Black Pond (H. S. Barber); Pimmit Run (E. A. Preble); Gordon Branch (E. A. Preble); Near Gordon Branch (E. A. Preble).



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONAN INTERESTING NEW GENUS OF ICERYINE
COCCID.

BY HAROLD MORRISON.

The description of the new genus and species of coccid which is given below has been prepared at the request of Dr. Sally Hughes-Schrader, Bryn Mawr College, in order that the technical name might be available for reference purposes in connection with the very interesting cytological studies which she is conducting on various species of monophlebine coccids. The genus is of particular interest because its type and only included species possesses in the adult female stage certain structural characters which suggest relationship with the tribe Llaveiini, although the sum total of its characters appears to place it without question in the tribe Iceryini.

Echinicerya, new genus.

In the adult female of the genotype there are present those derm structures which the writer has designated as spines in his recent classification of the genera related to this genus.¹

On this account the writer's key to the tribes of Monophlebinae (ref. cit. p. 119) must be modified in such fashion as to leave the segregation of portions of the tribes Monophlebini and Llaveiini dependent entirely upon the number of pairs of abdominal spiracles present. No modification of the larval key to the tribes of Monophlebinae (ref. cit. p. 120) appears to be necessary, as no definitely developed spines have been observed in the first stage larva of this new species. The differentiation of the adult males as given on the same page likewise apparently remains satisfactory as regards this new species. The important characters which differentiate this genus from other genera in the tribe Iceryini, following the writer's keys (ref. cit. pp. 196-197), are, in the adult female, the apparently one-segmented short conical beak, three pairs of abdominal spiracles, presence of distinct spines on the derm, and the presence of numerous (about 20)

¹U. S. D. A. Tech. Bull. 52, 1928.

ventral cicatrices arranged in an approximate semicircle or half oval on the under side of the abdomen. In the key to the first larval stage the species will go into the group of genera including *Crypticerya*, *Icerya*, and *Steatococcus*, and can probably be differentiated from these genera by the presence of six pairs of enlarged setae at the apex of the abdomen, but so many of the species belonging to these genera have not yet been studied critically in the larval stage that it is hardly advisable to set this down as a positive differentiating characteristic. So few males are known for species belonging to the tribe Iceryini that no differentiating characters can be suggested which will separate the male of this species from the males of other genera. In the structures examined it appears to be entirely comparable to other known iceryine males.

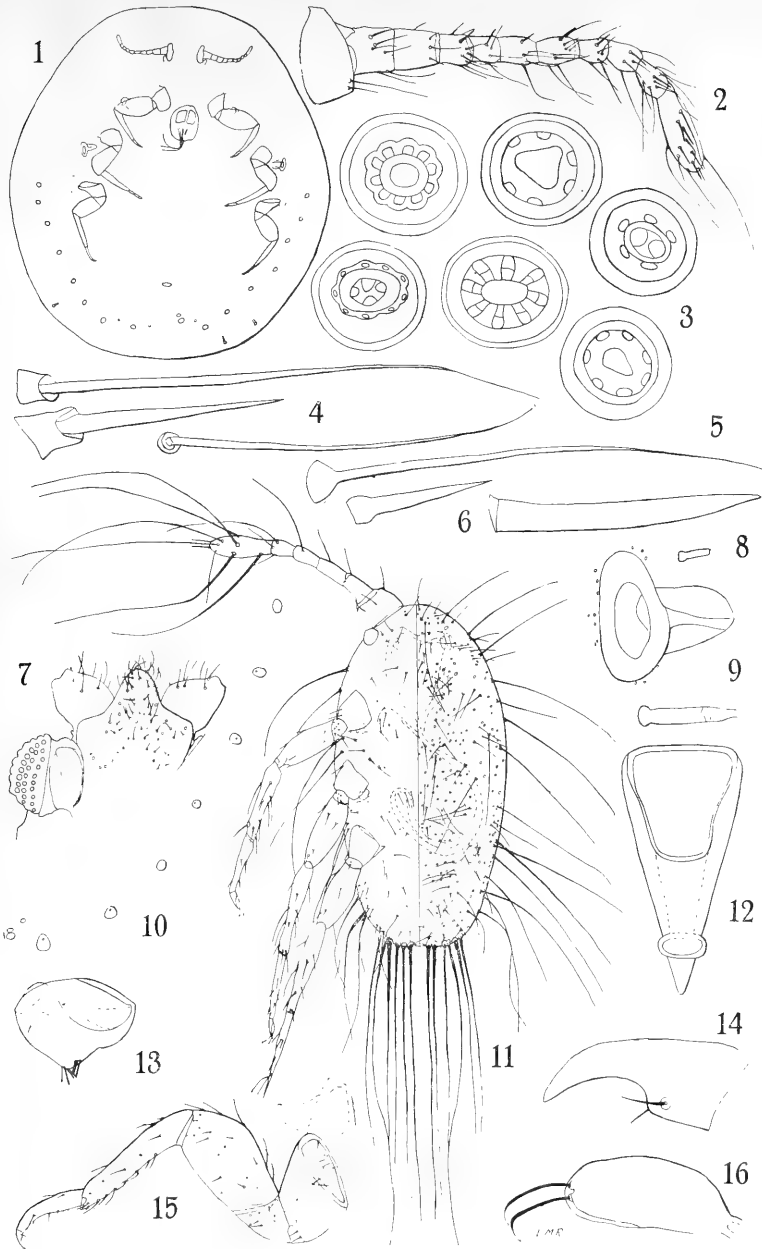
Type of genus.—*Echinicerya anomola*, new species.

The detailed description of this genotype follows:

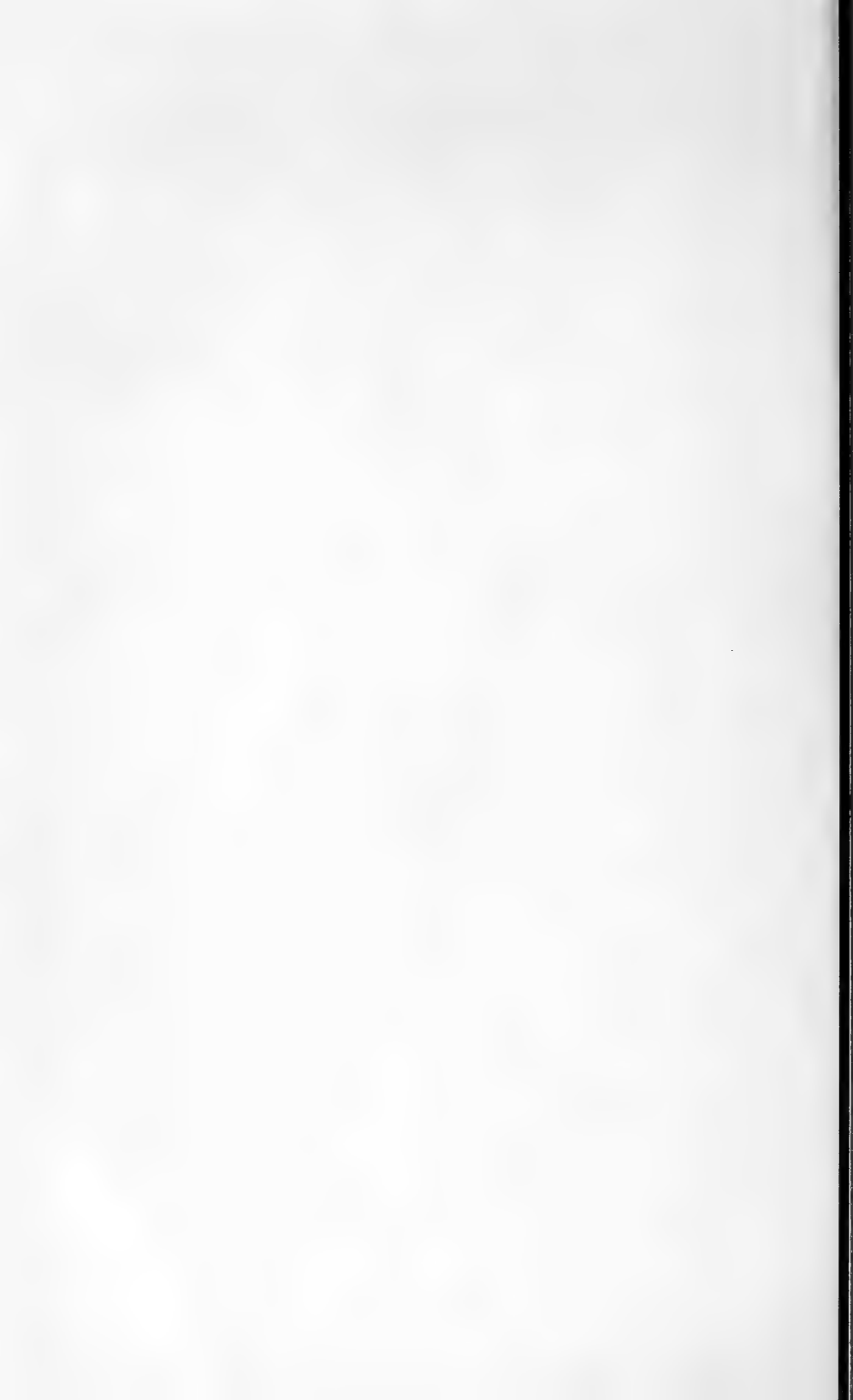
***Echinicerya anomola*, new species.**

Habit.—Living exposed on the host during the growing period; eggs deposited beneath the body of the female which becomes concave below as oviposition progresses, as in the genus *Crypticerya*.

Adult female.—Largest dimensions when covered with secretion 9 mm. long, 5 mm. wide and 5 mm. high. Entire body covered with white secretion and with one median incomplete row of conspicuous, elongate, truncate-conical tufts dorsally; one complete marginal row of short truncate-conical tufts, and an almost complete intermediate row of similar tufts on each side; color of denuded body in life coral-red but varying in shade. (From notes and sketches by Dr. Sally Hughes-Schrader.) Body as mounted varying; specimen examined 6 mm. long, $5\frac{1}{2}$ mm. wide, nearly circular but slightly narrowed anteriorly; derm thin, not chitinized, rather densely clothed with blackish spines, these occurring more densely in tufts along the body margin and dorsally, the tufts apparently coinciding with the secretory tufts of the living female; antennae of normal monophlebine type, 11-segmented in example studied, bearing the usual slender setae, some of which are fairly elongate, and stout sensory spines on apical segments; legs normal monophlebine type, fairly stout, trochanters with 3 to 4 sensory pores on each face, claws stout, somewhat curved, without distinct denticles, claw digitules slender, acute at tips, not nearly attaining the apex of claw (perhaps broken off); beak very short and stout conical with only one distinct segment, the second perhaps represented by a narrow basal collar; apical sensory setae uncertain as to number (perhaps six altogether), each nearly cylindrical, bluntly rounded at apex, beak elsewhere bearing a number of fairly stout, acute setae; thoracic spiracles broad with loose cluster of disk pores outside opening, this more evident in posterior pair; abdominal spiracles, so far as can be determined, present in three posterior pairs, elongate, cylindrical, of the usual iceryine type; derm pores of multilocular disk type only but with several different sorts of these present, showing variation in internal organization about as illustrated; derm bearing numerous spines and setae and a comparatively few scattered hairs; anal opening located dorsally and surrounded by a large



Anatomical Details of Echinicerya anomala.



cluster of circular disk pores with stiff setae interspersed; ring at inner end of tube, slender and without pores; ventral cicatrices numerous, arranged in a large half-oval row on the ventral face of the abdomen, the posterior one median, all small, circular or somewhat irregular, total number present 20 in specimen examined.

Intermediate female.—A specimen apparently representing this stage resembles the adult female in general in derm characters, including the types of pores, spines, setae and hairs present.

Larva.—Elliptical in shape or a little narrowed behind the middle, length approximately .9 mm., width .4 mm., derm membranous throughout; antennae 6-segmented, apical segment longest, two apical segments bearing several long slender setae, the second segment with single sensory pore at apex; legs normal monophlebine type, claws slender, curved at apices, each with distinct denticle near apex, claw digitules knobbed at tips and distinctly surpassing apex of claw, trochanters with two sensory pores on each face; beak very stout conical, 1-segmented or with a second, basal segment represented by a narrow rim, sensory setae apparently 6 to 8 in number, apices very slightly expanded and bluntly rounded; thoracic spiracles apparently not unusual; abdominal spiracles minute, slender, in three posterior pairs; derm pores of one general multilocular disk type but with few loculi; derm bearing slender setae dorsally, appearing as if in transverse rows, ventrally with setae and at least one incomplete longitudinal submedian row of hairs on each side; with 6 pairs of distinctly enlarged setae clustered at the posterior end of the abdomen of which the outer two pairs are somewhat smaller than the remainder; lateral margin of remainder of body with shorter, but enlarged and conspicuous slender marginal setae; anal opening dorsal, inconspicuous; anal tube not chitinized, with a double band of polygonal wax pores at inner end and a single circle of disk pores a little below the middle.

Adult male.—Of the usual elongate shape, total length, including apical fleshy tassels just over 3 mm., greatest width about .75 mm.; head triangular in outline, bearing a few normally quadrilocular disk pores and relatively numerous setae, these varying considerably in size; antennae 10-segmented, slender, the segments beyond the second each strongly binodose and bearing two whorls of setae, apical segment approximating those immediately preceding it in length; eyes strongly protruding, ocelli also conspicuous, each placed close above the anterior angle of the adjacent eye; wings dark, each about 2.5 mm. long by 1.3 mm. wide, diagonal vein extending about half way to margin as in other known iceryine males; halteres rather broad, flattened, but with only two large curved apical setae; legs slender, anterior femora with several (apparently about 23) slender bifurcate setae, claw digitules, apparently short and inconspicuous, perhaps broken off, legs otherwise normal; abdomen parallel-sided anteriorly, tapering towards the apex, with only a single apical pair of fleshy tassels, each bearing a considerable cluster of long blackish setae at tip; with three apical pairs of abdominal spiracles, all inconspicuous; derm pores of the flat sort usually found in the adult male stage, normally quadrilocular but number of loculi observed to vary from three to five; derm setae

varying considerably in size, pale and inconspicuous except the two apical clusters already mentioned; penis sheath elongate triangular, very slightly constricted near apex, tapering to a rounded point with two elongate sensory areas just at tip.

This species has been described from single mounted examples of the different stages discussed. The material was collected at Quirigua, Guatemala, during March, 1928, and the spring of 1929, on *Acacia* sp. by Dr. Sally Hughes-Schrader. In addition, a few other specimens, mostly of the immature stages, have been available for examination.

The types are in the U. S. National Collection of Coccidae.

It may be of added interest from a taxonomic viewpoint to note that Dr. Hughes-Schrader in her letter discussing this species remarks on the fact that her investigations have shown that its cytological and histological organization very closely resembles the condition in *Icerya* and is consequently sharply differentiated from the representatives of the tribe Llaveiini which she has examined.

EXPLANATION OF PLATE.

Fig. 1.—Adult female, optical section, X 7.5; 2, same, antenna, X 60; 3, same, derm disk pores, X 1500; 4, same, types of setae, X 650; 5, same, hair, X 650; 6, same, spines, X 650; 7, adult male, head dorsal, X 60; 8, adult female, thoracic and abdominal spiracles, X 60; 9, same, abdominal spiracles, X 120; 10, same, one-half of ventral cicatrices, X 18; 11, larva, dorsal to right, X 60; 12, adult male, penis sheath, X 120; 13, larva, beak, X 115; 14, adult female, claw, X 330; 15, same, leg, X 50; 16, adult male, halter, X 120. (Drawings by Miss Louise M. Russell.)

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



SEVENTH SUPPLEMENT TO THE FLORA OF THE
DISTRICT OF COLUMBIA AND VICINITY.

BY W. L. McATEE.

This supplement contains not only a list of additions¹ to knowledge of the Flora of the District of Columbia and Vicinity since the last summary in Volume 21 of Contributions from the United States National Herbarium, but also the results of a recheck of all records in what may be termed the regular series of publications on our flora beginning with that of Ward in 1881 and extending to that of Hitchcock and Standley (and 20 collaborators) in 1919. This series comprises the following:

Ward, Lester F., Guide to The Flora of Washington and Vicinity, Bul. 22, U. S. National Museum, 1881, 264 pp., 1 map.

Ward, Lester F. List of plants added to the flora of Washington from April 1, 1882, to April 1, 1884. Proc. Biol. Soc. Washington 2: 84-87. 1884.

Knowlton, Frank H. Additions to the flora of Washington and vicinity from April 1, 1884, to April 1, 1886. Op. cit. 3: 106-132. 1886.

Holm, Theodor. Third list of additions to the flora of Washington, D. C. Op. cit. 7: 105-132. 1892.

Holm, Theodor. Fourth list of additions to the flora of Washington, D. C. Op. cit. 10: 29-43. 1896.

Holm, Theodor. Fifth list of additions to the flora of Washington, D. C. Op. cit. 14: 7-22. 1901.

Steele, Edward S. Sixth list of additions to the flora of Washington, D. C., and vicinity. With Descriptions of New Species and Varieties by Edward L. Greene, Alvah A. Eaton, and the author. Op. cit. 14: 47-86. 1901.

¹Literature reviewed through 1928, local records through 1929.

Hitchcock, A. S. and Paul C. Standley (with the Assistance of the Botanists of Washington). *Flora of the District of Columbia and Vicinity*, Contr. U. S. National Herbarium, 21: 1919. 329 pp., 42 pls.

In the following pages the publications cited are referred to as 1881 Flora, Suppl. 1, Suppl. 2, etc., and 1919 Flora. In each case the number at the left refers to the pertinent page in the 1919 Flora.

The present, or seventh supplement, consists of five sections, namely:

I. Species, hybrids, and varieties hitherto unrecorded in the regular series of publications on the District of Columbia Flora.

II. Species and varieties previously recorded in the regular series of publications on District of Columbia plants, but not accounted for in the 1919 Flora.

III. Additional records for species, hybrids and varieties cited from only a single locality in the 1919 Flora.

IV. Miscellaneous additions and corrections to the 1919 Flora.

V. Records of certain transplanting operations.

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I.

Species, hybrids, and varieties, hitherto unrecorded in the regular series of publications on the District of Columbia Flora. This section totals 91 species, 53 varieties, and 1 hybrid.

52. *Botrychium obliquum* var. *elongatum* Gilbert and Haberer.

Recorded from D. C. by Robinson and Fernald (Gray's Man., 7th Ed., 1908, p. 49).

55. *Adiantum capillus-veneris* L.
Escaped at Woodside, Md. (Benedict, Amer. Fern Journ. 14, 1924, p. 21); station since destroyed, J. E. Benedict, Jr.
56. *Polystichum acrostichoides* var. *schweinitzii* (Beck) Small.
Fairly common, E. T. Wherry.
56. *Athyrium angustum* (Willd.) Presl.
Escaped from cultivation, Chevy Chase, D. C., 1925, Edgar T. Wherry.
57. *Filix fragilis* (L.) Underwood.
Two varieties occur, one with short erect rootstocks which grows on rocks and another with long horizontal rootstocks found in alluvial soil. The former is var. *mackayi* Lawson and the latter has not as yet received a name.
61. *Picea abies* (L.) Karst.
The Norway Spruce has escaped locally, Alvah Godding.
66. *Elodea occidentalis* Pursh.
Recorded from Washington, D. C., June 11, 1882, L. F. Ward, in Harold St. John's revision of this group according to which *E. canadensis* Michx. (*Anacharis canadensis* of the Flora) seems not to occur in our region.
72. *Andropogon scoparius* var. *villosissimus* Kearney.
Deanwood, D. C. (F. Tracy Hubbard, Rhodora, 19, p. 102, June, 1917); Hitchcock does not give this form nomenclatorial recognition.
80. *Echinochloa crusgalli* var. *mitis* Pursh.
Echinochloa crusgalli var. *edulis* Hitchc.
Recorded from D. C. by Hitchcock (Contr. U. S. Nat. Herb., 22, Pt. 3, 1920, pp. 145, 147, respectively).
80. *Chaetochloa ambigua* (Guss.) Scribn. and Merr.
Recorded from D. C. by Hitchcock (Contr. U. S. Nat. Herb., 22, Pt. 3, 1920, p. 186).
82. *Aristida curtissii* (A. Gray) Nash.
Near Chillum, Md., Sept. 24, 1926, S. F. Blake.
84. *Agrostis schweinitzii* Trin.
Low shady woods near Clinton, Md., Theo. Holm (det. C. V. Piper); regarded by Hitchcock as a synonym of *A. perennans* (Walt.) Tuckerm.
84. *Sphenopholis obtusata* var. *pubescens* (Scribn. and Merr.) Scribn.
Riverdale, Md., June 26, 1920, S. F. Blake.
90. *Bromus hordeaceus* var. *leptostachys* (Pers.) Beck.
Recorded from D. C. by Robinson and Fernald (Gray's Man.,

7th Ed., 1908, p. 163); regarded by Hitchcock as a synonym of *B. racemosus* L.

90. *Lolium multiflorum* Lam.

Old field near Clinton, Md., Theo. Holm.

91. *Elymus*.

In a revision of "The Missouri Species of *Elymus*" (Amer. Midl. Nat., 10, Nos. 2-3, March-May, 1926, pp. 49-88) B. F. Bush cites specimens from our region and makes changes affecting the names of our species. *E. striatus* var. *arkansanus* (Scribn. and Ball) Hitchc. of the Flora is raised to specific rank. *E. glaucifolius* Muhl. takes the place of *E. canadensis* L. of the Flora and is recorded from Maryland and the District of Columbia; its variety *E. g. var. crescendus* Ramaley is recorded from the D. C.; *E. virginicus* var. *intermedius* Vasey replaces *E. virginicus hirsutiglumis* (Scribn.) Hitchc. of the Flora, and *E. virginicus* var. *glabrifolius* Vasey is recorded from the District of Columbia. The D. C. list is amended from 4 species and 2 varieties to 5 species and 3 varieties.

92. *Phyllostachys mitis* Riv.

This small bamboo is escaped locally, for instance along Chain Bridge Road near Cherrydale, Va., and also near Fort C. F. Smith, Va., W. L. McAtee; identified by Agnes Chase.

96. *Eleocharis engelmanni* var. *detonsa* Gray.

Bradley Hills, Md., July 6, 1924, S. F. Blake.

101. *Carex caryophyllea* Lat.

Recorded from D. C. by Britton and Brown (Illus. Flora, 2nd Ed., 1, 1913, p. 391); and by Robinson and Fernald (Gray's Man., 7th Ed., 1908, p. 237).

108. *Carex plana* Mackenzie.

Camp Humphreys, Va., June 2, 1929, S. F. Blake. Determined by K. K. Mackenzie.

109. *Carex mirabilis* Dewey.

Chain Bridge Flats, June 1, 1919, F. W. Hunnewell.

109. *Carex tribuloides* var. *sangamonensis* Clokey.

Chillum, Md., June 21, 1926, S. F. Blake; determined by K. K. Mackenzie.

111. *Carex plantaginea* Lam.

Fairfax County, Va., April 14, 1918, F. W. Hunnewell.

114. *Wolffiella floridana* (J. D. Smith) C. H. Thomps.

Shaw's Lily Ponds, Kenilworth, D. C., Aug. 4, 5, 1929, S. F. Blake.

115. *Eriocaulon parkeri* Robinson.

Mouth of Cameron Run, near New Alexandria, Va., Aug. 13, 1910 (F. W. Pennell, Torreya, 2, No. 6, June, 1911, p. 13). This is the

basis of the Washington, D. C., record by Britton and Brown (Illus. Flora, 2nd Ed., I, 1913, p. 454), copied by E. J. Grimes (Rhodora, 24, p. 149, Aug., 1922). The identification originally by J. K. Small is confirmed by Bayard Long who has recently examined the material at the Academy of Natural Sciences in Philadelphia. Previously *Eriocaulon parkeri* has been recorded only from scattered stations in eastern estuaries. It has been collected in our region also from the shore of Accotink Bay, Camp Humphrey, Va., Oct. 12, 1924, and also at the original locality, Oct. 20, 1929, by S. F. Blake.

118. *Juncus tenuis* var. *anthelatus* Wiegand.

Near Cheverly, Md., July 9, 1926, S. F. Blake; determined by K. M. Wiegand.

119. *Juncus debilis* Gray.

Low wet ground in woods near Clinton, Md., Theo. Holm (determined by F. V. Coville and S. F. Blake).

120. *Tulipa sylvestris* L.

Brookville Road, 1 mile southwest of Forest Glen, Md., April, 1929, G. W. Morey.

122. *Yucca filamentosa* L.

Established on interurban right of way, Orchard View Station, Md., where the Baltimore Boulevard crosses the tracks. F. M. Uhler, W. L. McAtee.

124. *Polygonatum hebetifolium* (Gates) Bush.

Originally described as a variety of *P. biflorum* (Walt) Ell., in part from local material (Gates, R. R., Bul. Torrey Bot. Club, 44, No. 3, March, 1917, p. 122), is recorded from Chevy Chase, D. C., and Sligo, Md., by B. F. Bush (Amer. Midland Nat., 10, Nos. 11-12, Sept.-Nov., 1927, p. 392).

124. *Polygonatum commutatum* var. *virginicum* (Greene) Gates.

Dalecarlia Reservoir, D. C.; May 23, 1905, Joseph H. Painter (Gates, loc. cit. p. 124). "Mr. Hunnewell * * * showed a *Polygonatum* from Washington, D. C., and Virginia, which * * * has been described as *P. commutatum* (R. & S.) Dietr. var. *virginicum* (Greene) Gates" (Notice No. 14, New Engl. Bot. Club., p. [3], Sept., 1925). This would place as a variety of *P. giganteum* of the Flora.

125. *Smilax glauca* var. *leurophylla* Blake.

Local material is used as part of the basis for this variety which differs from the typical and more southern variety by having the leaves neither pulverulent nor papillose beneath. (Blake, S. F., Rhodora, 20, p. 80, April, 1918.)

126. *Iris virginica* L.

This species considered separable from *I. versicolor* L. by Edgar Anderson is recorded by him from Alexander Id., D. C., May 15, 1915, Van Eseltine (Ann. Mo. Bot. Gard. 15, No. 3, Sept., 1928, p. 256).

130. *Isotria affinis* (Aust.) Rydb.
North of Chevy Chase, J. Frank Schairer; English Corners, Bethesda, Md., June 5, 1929, O. M. Freeman.
131. *Corallorrhiza odororhiza* forma *flavida* Wherry.
This form was described (Journ. Wash. Acad. Sci., 17, 1927, p. 36) from a plant collected in 1924, by Mrs. Nellie C. Knappen in a ravine west of Pierce Mill.
135. *Populus balsamifera* L.
Recorded from banks of Potomac opposite Plummers Id., Md. (Sargent, C. S., Journ. Arn. Arb. 1, No. 1, July, 1919, p. 63).
135. *Myrica cerifera* L.
Paint Branch Bog No. 2, Md. I inspected this plant for several years before obtaining mature fruit that enabled positive identification. W. L. McAtee.
136. *Carya glabra* var. *hirsuta* Ashe.
"This tree is not uncommon on rocky wooded slopes along the Potomac River at Great Falls, Virginia." (W. W. Ashe, Bul. Torrey Bot. Club., 46, p. 225, June, 1919).
136. *Carya glabra* var. *megacarpa* Sargent.
District of Columbia (C. S. Sargent, Bot. Gaz. 66, p. 244, Sept., 1918).
136. *Carya ovalis* Wang. var. *odorata* Sargent.
District of Columbia (C. S. Sargent, op. cit. p. 246).
145. *Polygonum aequale* Lindman.
Vacant lots in Anacostia, D. C., and on old roads near Clinton, Md., Theo. Holm. A segregate from *P. aviculare* L. (Lindman, C. A. M., Svensk Bot. Tidschr. 6, 1912, pp. 673-696, Pls. 23-26).
154. *Dianthus barbatus* L.
Collected along roadside, Suitland, Md., May 26, 1918, in flower; the rootstock, 18 inches in length, showed the plant had been established some years; several plants were seen. W. L. McAtee.
155. *Nymphaea americana* (Prov.) Miller and Standley.
Accotink, Va., Edgar T. Wherry.
155. *Nelumbo lutea* (Willd.) Pers.
Accotink Bay, August, 1923, J. E. Benedict, Jr., and Edgar T. Wherry.
156. *Coptis trifolia* (L.) Salisb.
Ammendale, Md., Brother Arsene.
158. *Ranunculus delphinifolius* Torr.
In a pool between Widewater on the canal and the river, Robert Humphrey.

158. **Ranunculus parviflorus** L.
Weed in experimental chestnut orchard, Bell, Md., June 9, 1928.
W. L. McAtee.
161. **Magnolia tripetala** L.
Well established in upper Rock Creek Park at several places;
appears native but possibly escaped from old time plantings; bloomed
well, 1926, Elmer Walter.
162. **Platystemon californicus** Benth.
Potomac Park, D. C., along railroad, April 15, 1921, O. M. Free-
man.
165. **Alyssum alyssoides** L.
Lanham, Md., June, 1909 (C. F. Wheeler's notes).
167. **Sophia pinnata** (Walt.) Howell.
Baltimore and Ohio belt railroad near District Line, Md.; Great
Falls, Va., Mrs. O. M. Freeman.
170. **Reseda lutea** L.
Abundant in old fields in the vicinity of Arundel, Md., Wild Flower
Preservation Society, July 4, 1928.
171. **Philadelphus coronarius** L.
Escaped in woods near Potomac, Md., August 13, 1920, O. M.
Freeman.
171. **Heuchera pubescens** Pursh.
Rich woods above Great Falls, Va., June, 1917, Titus Ulke (det.
E. P. Killip).
172. **Saxifraga pennsylvanica** L.
Pinehurst, 1920, C. E. Waters.
172. **Hydrangea arborescens** var. **oblonga** T. and G.
Recorded from the District of Columbia by Harold St. John (Rho-
dora, 23, p. 207, Sept., 1921).
174. **Spiraea alba** Du Roi.
Dunn-Loring, Va., Aug., 1922; two miles northwest of Beane, Md.,
Aug., 1927, O. M. Freeman.
174. **Rosa carolina** var. **glandulosa** Crepin.
Takoma Park, D. C. (Alfred Rehder, Journ. Arn. Arb., 3, No. 1,
July, 1921, p. 16.
175. **Rubus occidentalis** forma **pallidus** (Bailey) Robinson.
Beltsville, Md., Cherrydale, Va., W. L. McAtee.
175. **Rubus alleghaniensis** Porter.
Recorded from our region by Wm. H. Blanchard (Torreya, 7,
No. 3, March, 1907, p. 56).

175. *Rubus frondosus* Bigelow.

About Washington as far as Fairfax, Va. (Blanchard, Bul. Torr. Bot. Club, 38, No. 9, Sept., 1911, p. 434-435). Blanchard described (*Torreya*, loc. cit.) in part from local material, *R. philadelphicus*, a form which he was later inclined to think should be recognized as a variety of *R. frondosus*.

175. *Rubus andrewsianus* Blanchard.

Recorded from our region in both of the foregoing references by Blanchard (*Torreya*, p. 56, Bul. Torr. Club, p. 438).

175. *Rubus phoenicolasius* Maxim.

Large colonies are established in several localities, one of which is near Lock No. 13, C. and O. Canal, Md., and another along roadside near Lyttonsville, Md., W. L. McAtee.

176. *Geum canadense* var. *grimesii* Fernald and Weatherby.

This variety was described in part from local material, Washington, D. C., June 18, 1896, E. S. Steele (M. L. Fernald and C. A. Weatherby, *Rhodora*, 24, p. 49, March, 1922).

176. *Dryocallis agrimonioides* Pursh (*Potentilla arguta* Pursh).

Recorded from D. C. by Robinson and Fernald (*Gray's Man.*, 7th Ed., 1908, p. 481); also by Small (Galley proof, new Manual Flora S. E. States).

177. *Malus platycarpa* Rehd. var. *hoopesii* Rehd.

Ballston, Va., April 23, 1929, S. F. Blake. Determined by A. Rehder.

178. *Amelanchier laevis* Wiegand.

Apparently should be given formal status in the list. Specimens of this species from here have been identified by its author, and W. W. Ashe implies its presence here by the expression "not common" (*Bul. Torrey Bot. Club*, 46, p. 221, June, 1919). F. W. Hunnewell identified it from Montgomery Co., Md., April 20, 1919. Alfred Rehder records also an *A. canadensis* \times *laevis* hybrid from Alexandria, Va. (*Journ. Arn. Arb.*, 2, No. 1, p. 46, July, 1920).

178. *Amelanchier canadensis* var. *intermedia* Spach.

Apparently the common form in Magnolia bogs (W. L. McAtee, *Bul. 1, Biol. Soc. Wash.*, 1918, p. 79; W. W. Ashe, op. cit. pp. 221-222; K. M. Wiegand, *Rhodora*, 22, p. 148, September, 1920).

178. *Amelanchier sanguinea* Pursh.

"On shaded rocks along the Potomac River, at Great Falls, Virginia" (Ashe, op. cit., p. 222).

178. *Amelanchier sera* Ashe.

Described from material collected "on rocky banks along the Potomac River, Fairfax County, Virginia, and Montgomery County, Maryland" (Ashe, op. cit., pp. 222-223).

178. *Amelanchier micropetala* var. *potomacensis* Ashe.
Described from "rocky banks along the Potomac River, Fairfax County, Virginia" (Ashe, op. cit., pp. 223-224).
179. *Crataegus apposita* Sargent.
Great Falls, Va. (W. W. Ashe, Bul. Torrey Bot. Club, 46, p. 225, June, 1919).
179. *Crataegus smithii* Sargent.
Great Falls, Va. (Ashe, loc. cit.).
185. *Coronilla varia* L.
Compost heap, Arlington Farm, Va., June 16, 1928, W. L. McAtee.
186. *Meibomia sessilifolia* Torr.
St. Elmo, Va., August 18, 1921, O. M. Freeman.
188. *Lespedeza stuvei* var. *neglecta* Britton.
Oak Station near Dyke, Va., Oct. 21, 1924, S. F. Blake.
190. *Strophostyles helvola* var. *missouriensis* (S. Wats.) Britt.
Swamps, New Alexandria, Va., 1924, Edgar T. Wherry. This form is given specific rank by Britton and Brown (Illus. Flora, 2nd Ed II, 1913, p. 423). Recorded from D. C. by Robinson and Fernald (Gray's Man. 7th Ed., 1908, p. 529).
190. *Tropaeolum majus* L.
The common nasturtium was collected in flower in the bottom of a ditch, far from any house, at Dyke, Va., July 4, 1910, W. L. McAtee.
192. *Geranium bicknellii* Britton.
Arlington Farm, Va., May 12, 1903 (C. F. Wheeler's notes).
192. *Xanthoxalis corniculata* var. *langloisii* Small.
Banks of Potomac, District of Columbia, F. Peck (K. M. Wiegand, Rhodora, 27, p. 121, July, 1925).
195. *Croton monanthogynus* Michx.
A waif near Chevy Chase, D. C., 1925, Edgar T. Wherry.
195. *Croton capitatus* Michx.
Linden, Md., Oct. 14, 1928, J. E. Benedict, Jr.
195. *Acalypha digyneia* Raf.
Bethesda, Md., Sept. 10, 1899, E. S. Steele (C. A. Weatherby, Rhodora, 29, p. 199, Oct., 1927).
197. *Tithymalus peplus* (L.) Hill.
Scott's Id., Md., Oct., 1922, E. A. Preble.
200. *Acer rubrum* var. *tridens* Wood.
Hyattsville, Md., July 12, 1926, Paul C. Standley and S. F. Blake.

201. *Impatiens balsamina* L.

Spontaneous in my yard, formerly woodland, for years; Maywood, Va., W. L. McAtee.

202. *Tilia michauxii* Nutt.

"Along the Potomac River from above Great Falls to below Marshall Hall, Va." (W. W. Ashe, Bul. Torrey Bot. Club, 46, p. 225, June, 1919.)

202. *Tilia neglecta* Spach.

"Growing with the preceding but in greater abundance." (Ashe, op. cit., p. 226.) Valley of Potomac River (C. S. Sargent, Bot. Gaz. 66, p. 495, Dec., 1918).

202. *Althaea rosea* Cav.

Rough land near seawall, West Potomac Park, July 15, 1928, W. L. McAtee.

203. *Napaea dioica* L.

Below Great Falls, Va., Aug. 21, 1917, W. L. McAtee.

205. *Hypericum virgatum* Lam.

One mile southeast of Laurel, 1922, Edgar T. Wherry.

205. *Elatine minima* Nutt.

Alexandria, Va., A. H. Curtiss (M. L. Fernald, Rhodora, 19, p. 15, Jan., 1917).

207. *Viola chinensis* L. (*V. lancifolia* Pollard.)

Recorded as spontaneous in botanical gardens, D. C., by Britton and Brown (Illus. Flora, 2nd Ed., 2, 1913, p. 558).

208. *Viola incognita* Brainerd.

Kensington, Md., 1926, R. G. Cogswell.

210. *Viola hirsutula* x *papilionacea*.

This hybrid is recorded from the District of Columbia region by Ezra Brainerd (Bul. 224, Vt. Agr. Exp. Sta., p. 169, Dec., 1921).

211. *Opuntia pollardi* Britton and Rose.

The plants near Bowie and elsewhere east of Washington appear to represent this species, Edgar T. Wherry.

211. *Opuntia calcicola* Wherry.

Banks of Potomac, south of Poolesville, Md., and possibly nearer Washington, Edgar T. Wherry (Journ. Wash. Acad. Sci., 16, 1926, p. 13).

211. *Elaeagnus multiflora* Thunb.

Edge of canal near Cabin John, Md., 1928, A. K. Fisher.

211. *Elaeagnus umbellata* Thunb.

Forest Glen, Md., April 28, 1929, J. E. Benedict, Jr.

217. *Bupleurum rotundifolium* L.

At present a waif near Chevy Chase, D. C., Edgar T. Wherry.

218. *Osmorrhiza longistylis* var. *brachycoma* Blake.

Described in part from District of Columbia material, the type from Cabin John, Md. (S. F. Blake, *Rhodora*, 25, pp. 110-111, July, 1923).

218. *Osmorrhiza longistylis* var. *villicaulis* Fernald.

Common in our region (Blake, loc. cit.). The key on p. 217 requires revision as a result of these studies.

218. *Chaerophyllum procumbens* var. *shortii* Torr. and Gr.

Recorded by Coulter and Rose. (*Contr. U. S. Nat. Herb.*, 7, No. 1, p. 59, Dec. 1900).

218. *Oenanthe phellandrum* Lam.

Collected June 10, 1897, near Washington Monument, by E. S. Steele (Coulter and Rose, *Contr. U. S. Nat. Herb.* 7, no. 1, Dec., 1900, p. 254).

218. *Oxypolis rigidior* var. *ambigua* (Nutt.) Robinson.

Recorded under the name *longifolia* Britton from various Magnolia Bogs. (McAtee, *Bul. 1, Biol. Soc. Wash.*, 1918, pp. 80, 83.)

218. *Pimpinella saxifraga* L.

English Corners, Bethesda, Md., July 21, 1929, O. M. Freeman.

222. *Hypopitys insignita* Bicknell.

Occurs at several places east and northeast of Washington, among them, Riverdale, Ardwick, and Suitland, Edgar T. Wherry. This is probably the peculiar form referred to by Holm (*Suppl. 4*, p. 36).

223. *Azalea arborescens* Pursh.

Great Falls, Va. (W. W. Ashe, *Bul. Torrey Bot. Club*, 47, p. 582, Dec., 1920); Difficult Run, Va., 1924, Edgar T. Wherry. According to Rehder our local form is var. *richardsonii*.

223. *Azalea atlantica* Ashe.

Takoma Park, May 11, 1900, T. A. Williams (Alfred Rehder, *Publ. 9, Arn. Arb.*, p. 148, 1921).

223. *Azalea viscosa* variety.

Rhododendron viscosa forma *rhodantha* Rehder was described in part from local material Hyattsville, Md., May 31, 1915, E. S. Steele; Washington, D. C., June 15, 1909, W. W. Cooke (Rehder, op. cit. p. 160).

223. *Azalea viscosa* variety.

Rhododendron viscosa var., *tomentosa* (Dumont de Courset), Hyattsville, Md., June 27, F. H. Knowlton; June 4, 1904, H. D. House; Barcroft, Va., June 6, 1915, E. S. Steele (Rehder, op. cit., p. 163).

223. *Azalea rosea* Lois.

Difficult Run, Va., May 16, 1920, E. P. Killip, determined by Rehder. [Rehder treats all of the azaleas under the genus *Rhododendron*.]

225. *Vaccinium vacillans* var. *crinitum* Fernald.

Lanham, Bladensburg, and Hyattsville, Md., S. F. Blake.

225. *Vaccinium pennsylvanicum* Lam.

A small colony on wooded hillside, Arundel, Md., Wild Flower Preservation Society, July 4, 1928.

226. *Anagallis arvensis* var. *caerulea* (Schreb.) Ledeb.

Abundant at Arundel, Md., Edgar T. Wherry.

228. *Fraxinus caroliniana* Mill.

"Along the Potomac River opposite Washington" (W. W. Ashe, *Bul. Torrey Bot. Club*, 46, p. 226, June, 1919).

229. *Gentiana clausa* Raf.

Much of the Washington material included in *G. andrewsii* Griseb. in the 1919 Flora corresponds to this as redefined by Fernald (*Rhodora*, 19, 1917, p. 147).

230. *Trachelospermum difforme* (Walt.) Gray.

Meadow by river, Washington, June 5, 1918, F. W. Hunnewell.

234. *Convolvulus japonicus* Thunb.

Recorded from D. C. by Britton and Brown (*Illus. Flora*, 2nd Ed., III, 1913, p. 46).

235. *Phlox subulata*.

Local plants are densely glandular on new growth and have the flowers chiefly white, corresponding in these respects with *P. brittonii* Small, which probably should be ranked as a variety of *P. subulata*, Edgar T. Wherry.

237. *Lappula lappula* L.

Railroad yard opposite Bureau of Printing and Engraving, Washington, D. C., Grace G. Street.

242. *Agastache scrophulariaefolia* (Willd.) Ktze.

Boulder Bridge, Rock Creek Park, 1922, Edgar T. Wherry

244. *Monarda media* Willd.

Glenmont, Md. (north of Wheaton), 1926, Edgar T. Wherry.

250. *Chelone glabra* var. *ochroleuca* Pennell and Wherry.

Patuxent River (Wherry, Edgar T., *Bartonia*, 10, 12, Jan., 1929, p. 2).

250. *Chelone obliqua* L.

Patuxent Swamp, near Marlboro, Md., 1924, J. E. Benedict, Jr., 1925, Edgar T. Wherry. This plant had been lost to science for 175 years until thus rediscovered. (See *Bartonia*, 10, 12, Jan., 1929, p. 2).

251. *Ilysanthes dubia* var. *inundata* Pennell.

Recorded from along the Potomac River near Alexandria, Va., in connection with the original description. (Pennell, F. W., *Torreyia*, 19, p. 149, Aug., 1919).

252. *Veronica anagallis-aquatica* L.

Muddy shore of Potomac, July 13, 1918, F. W. Hunnewell.

255. *Seticapsella cleistogama* (A. Gray) Barnhart.

Suitland, Md., Edgar T. Wherry.

255. *Stomosisia juncea* (Vahl.) Barnhart.

Suitland bog, Aug. 13, 1921, O. M. Freeman.

258. *Galium mollugo* L.

Ammendale, Md., Sept. 8, 1916, Brother F. Hyacinth; large clump by roadside, "King St. extended," near Alexandria line, Arlington Co., Va., May 14, 1929, S. F. Blake.

258. *Galium pilosum* var. *punctulosum* (Michx.) Torr. and Gray.

Near Hyattsville, Md., July 29, 1920, S. F. Blake.

258. *Galium verum* L.

Discovered at Arundel, Md., years ago by M. B. Waite; still to be found there; also one mile south of Laurel, 1922, Edgar T. Wherry.

264. *Picris echioides* L.

Chevy Chase, D. C., Sept. 23, 1928, P. L. Ricker.

265. *Prenanthes altissima* L.

Near Bethesda, Md., 1925, W. L. McAtee.

267. *Crepis japonica* (L.) Benth.

Well established on the estate of Dr. E. A. Merritt, one mile northwest of Chevy Chase Lake, Md., May 29, 1929, O. M. Freeman.

267. *Xanthium*.

A new treatment of the genus for the region, based on the revision of Millspaugh and Sherff, was published by McAtee and Metcalf in 1920 (*Proc. Biol. Soc. Wash.* 33, pp. 177-179, Pl. 4). A key based on characters of the burs is given as well as illustrations of the latter. The revised list is:

267. *Xanthium spinosum* L.

Rare waif in various localities, not collected since 1896.

267. *Xanthium chinense* Mill.
Abundant in waste ground, cultivated fields and dumps. (*X. americanum* of the Flora.)
267. *Xanthium pennsylvanicum* Wallr.
Same status as last. (*X. commune* of the Flora in part.)
267. *Xanthium italicum* Moretti.
Frequent in waste ground. (*X. commune* of the Flora in part.)
267. *Xanthium speciosum* Kearney.
A single, but robust plant along Water St., near 33d.
274. *Eupatorium album* var. *subvenosum* Gray.
Recorded from Terra Cotta Swamp and other localities (McAtee, Bul. 1, Biol. Soc. Wash., 1918, p. 83).
275. *Eupatorium urticaefolium* var. *villicaule* Fernald.
Between Little Falls and Chain Bridge, Va., Sept. 21, 1920, S. F. Blake.
278. *Solidago juncea* var. *scabrella* (Torr. and Gray) Gray.
Clarendon, Va., 1928, S. F. Blake.
281. *Aster lateriflorus* var. *pendulus* (Ait.) Burgess.
Lanham, Md., 1912, W. R. Maxon (Wiegand, K. M., Rhodora, 30, p. 174, Sept., 1928).
281. *Aster vimineus* var. *dubius* Wiegand.
Described in part from local material, Hyattsville, Md., 1914, E. S. Steele (Wiegand, K. M., Rhodora, 30, p. 171, Sept., 1928).
281. *Aster dumosus* var. *coridifolius* (Michx.) Torr. and Gray.
Takoma Park, D. C., 1897, T. A. Williams; Riverdale, Md., 1916, E. S. Steele (Wiegand, K. M., Rhodora, 30, p. 166, Sept. 1928).
282. *Aster paniculatus* var. *simplex* Willd.
Mineshoe Id., Md., Edgar T. Wherry.
282. *Aster ericoides* var. *platyphyllus* Torr. and Gray.
Conduit Road, Md., about opposite Lock No. 14, Oct. 30, 1927 (Blake, S. F., Rhodora, 30, p. 106, May, 1928).
282. *Erigeron pusillus* Nutt.
Landover, Md., Aug. 26, 1923, S. F. Blake.
284. *Gnaphalium obtusifolium* var. *helleri* (Britton) Blake.
Near Cabin John, Md., Oct. 26, 1923, S. F. Blake.
285. *Parthenium hysterophorus* L.
Twelfth St., near Ohio Ave., Washington, D. C., July 5, Aug. 2, 1929, W. A. Dayton and S. F. Blake.

289. *Bidens aristosa* var. *fritcheyi* Fernald.
Great Falls, Va., Cabin John, Md., E. S. Steele; near Plummerville, Md., Philip Dowell; West Potomac Park, S. F. Blake (S. F. Blake).
289. *Bidens aristosa* var. *mutica* A. Gray.
Glen Echo, Md., Sept. 17, 1920, S. F. Blake.
289. *Bidens frondosa* var. *anomala* Porter.
Georgetown, D. C. (Sherff, E. E., Bot. Gaz. 4, p. 34, July, 1917); various localities in our region (Blake, S. F., Rhodora, 27, pp. 34-35, Feb., 1925).
290. *Helenium tenuifolium* Nutt.
Abundant by roadside, Fort Humphreys near Accotink, Va., Oct. 12, 1924, S. F. Blake.
290. *Matricaria chamomilla* L.
One plant in old vegetable garden, and a good-sized colony behind an unoccupied house, Clarendon, Va., 1928, S. F. Blake.
292. *Cirsium arvense* var. *integrifolium* Wimm. and Grab.
Near Cabin John, Md., June 26, 1926, S. F. Blake.

II.

Species and varieties previously recorded in the regular series of publications on District of Columbia plants, but not accounted for in the 1919 Flora. Some of these may represent misidentifications and if any one has information to that effect it should be placed on record. This section totals 50 species and 36 varieties.

54. *Pteridium latiusculum* var. *pseudocaudatum* Clute.
Kenilworth and Hyattsville, E. S. Steele (Suppl. 6, p. 48).
59. *Lycopodium annotinum* L.
Holmead Swamp, E. Foreman (Suppl. 2, p. 110); Henson's Creek, G. W. Oliver (Suppl. 3, p. 131). Out of range, probably a misidentification.
59. *Lycopodium alopecuroides* L.
Sphagnum Swamp, Henson's Creek, G. W. Oliver (Suppl. 3, p. 131); later (1919) found by W. R. Maxon and P. C. Standley in Suitland Bog (Amer. Fern Journ. 10, 1920, p. 1); College Park, Md., 1924, E. T. Wherry; clay pit near Arlington Farm, Va., 1924, S. F. Blake.
60. *Isoetes saccharata* var. *reticulata* A. A. Eaton.
Hunting Creek, Geo. Vasey, Frederick Coville, W. R. Maxon; Anacostia River, E. S. Steele. Described wholly from local material (Suppl. 6, p. 49); on the same page Eaton describes also var. *palmeri*, and notes that specimens collected at Mount Vernon by Coville are intermediate between it and the typical form.

60. *Isoetes riparia* Engelm.

Hunting Creek, F. V. Coville (Suppl. 3, p. 132). Restricted by Gray's Manual to a plant found on tidal shores of the Delaware River. The local record may be correct nevertheless; compare the similar range of *Eriocaulon parkeri*.

77. *Panicum angustifolium* Ell.

The records of *P. ramulosum* Michx., Takoma, F. L. Scribner and T. H. Kearney, Jr. (Suppl. 4, p. 42); Terra Cotta, Theo. Holm (Suppl. 5, p. 21) may belong here; if so it is an additional species for the list.

80. *Chaetochloa geniculata* var. *perennis* Hall.

Various localities, E. S. Steele (Suppl. 6, p. 51). A variety not mentioned in the 1919 Flora but stated by Hitchcock in his later revision of the North American species (Contr. U. S. Nat. Herb., 22, Pt. 3, 1920, p. 172) to be unworthy along with other variants of the species, of nomenclatorial recognition.

80. *Cenchrus*.

According to Mrs. Chase's 1920 revision (Contr. U. S. Nat. Herb., 22, Pt. 1, pp. 69-74) *C. tribuloides* L. and *C. pauciflorus* Benth. both occur in our region. The records cited are: Mount Vernon, Tidestrom, for the former, and Deanwood, D. C., for the latter; *pauciflorus* occurs also at Black Pond, Va., Edgar T. Wherry, 1923.

82. *Aristida gracilis* var. *depauperata* Gray.

Bennings, E. S. Steele (Suppl. 6, p. 51).

83. *Agrostis canina* L.

Vacant lots near B. & O. Depot (i. e. First and C Sts. N. W.), F. L. Scribner (Suppl. 2, p. 109).

85. *Danthonia sericea* Nutt.

West of Tenleytown, G. B. Sudworth (Suppl. 3, p. 130); near Highland, Theo. Holm (Suppl. 5, p. 20).

86. *Tridens flavus* variety.

Tricuspis sesleroides var. *pallida* Holm. described from Marshall Hall (Suppl. 5, p. 19) is said to be the typical form, and the name therefore is a straight synonym.

90. *Bromus maximus* Desf.

Dumping ground, D. C., E. S. Steele (Suppl. 6, p. 53).

91. *Elymus striatus* var. *villosus* Gray.

1881 Flora (p. 134); evidently not considered worthy of recognition.

93. *Cyperus rivularis* Kunth.

Typical form and the variety *eluta* Clarke are equally common, Theo. Holm (Suppl. 5, p. 17).

94. *Cyperus fuscus* var. *viridescens* Hoffm.
Foot of Duke St., Alexandria, E. S. Steele (Suppl. 6, p. 53).
94. *Cyperus cylindricus* (Ell.) Britton.
Kenilworth Swamp; Bennings, E. S. Steele (Suppl. 6, p. 54).
94. *Cyperus strigosus* var. *robustior* Kunth.
Recorded by E. S. Steele (Suppl. 6, p. 53).
94. *Cyperus strigosus* var. *compositus* Britton.
Recorded by E. S. Steele (Suppl. 6, p. 53).
96. *Eleocharis intermedia* (Muhl.) Schultes.
Opposite Eighth Lock, Md., G. H. Hicks (Suppl. 4, p. 39); near Takoma; Marshall Hall, Theo. Holm (Suppl. 5, p. 18).
96. *Eleocharis obtusa* var. *jejuna* Fernald.
Kenilworth, E. S. Steele (Suppl. 6, p. 54).
98. *Fuirena squarrosa* Michx.
Holmead Swamp (1881 Flora, p. 125); Lydecker Basin, Theo. Holm (Suppl. 5, p. 17); the 1919 Flora does not state whether these are considered misidentifications; the plant's range covers our region.
99. *Rynchospora fusca* L.
Doubtfully recorded in the Flora. Theo. Holm reports it from near Fort Myer (Suppl. 5, p. 18).
100. *Scleria reticularis* var. *pubescens* Britton.
Paint Branch Bogs; north of Kenilworth, E. S. Steele (Suppl. 5, p. 55). S. F. Blake also collected this form in the Powder Mill Bogs, Aug. 27, 1928.
110. *Carex communis* var. *wheeleri* Bailey.
Potomac Shore, Va., Theo. Holm (Suppl. 4, p. 41).
114. *Lemna gibba* L.
Old Canal, foot of Eighteenth and Twentieth Sts., Lester F. Ward (Suppl. 3, p. 125). Out of range, probably a misidentification.
119. *Juncus brevicaudatus* (Engelm.) Fernald.
Bennings, E. S. Steele (Suppl. 6, p. 58).
127. *Sisyrinchium angustifolium* Mill.
Conduit Road, E. S. Steele (Suppl. 6, p. 59).
133. *Salix alba* var. *vitellina* (L.) Koch.
1881 Flora (p. 116).
140. *Quercus lyrata* Walt.
Bottoms 3 miles below Laurel, Md., Robert Ridgway (Garden and Forest, 3, p. 129, March, 1890); near High Island, Geo. B. Sudworth (Suppl. 3, p. 24).

141. *Celtis occidentalis* var. *pumila* Muhl.
Various localities, E. S. Steele (Suppl. 6, p. 60).
141. *Morus alba* var. *tatarica* (L.) Loud.
Near old observatory; Canal Road, E. S. Steele (Suppl. 6, p. 60).
144. *Rumex brittanicus* L.
Rosslyn, Va., G. H. Hicks (Suppl. 4, p. 38); also recorded in 1881 Flora (p. 108).
147. *Polygonum dumetorum* L.
Recorded by Ward (1881 Flora, p. 108). Whether in the 1919 Flora it was intended to synonymize this name with *scandens* L. is not made clear. The two are treated as distinct by current manuals.
149. *Acnida tamariscina* (Nutt.) Wood.
Potomac Flats, E. S. Steele (Suppl. 6, p. 61).
153. *Alsine stricta* Michx.
Great Falls, G. H. Hicks (Suppl. 5, p. 10).
155. *Castalia tuberosa* Paine.
Little Hunting Creek, W. Hunter (Suppl. 3, p. 107). Probably a misidentification.
159. *Thalictrum coriaceum* (Britt.) Small.
Common, E. S. Steele (Suppl. 6, p. 63). This record of a mountain form probably is a misidentification.
169. *Cardamine parviflora* var. *arenicola* Britton.
Potomac Flats, E. S. Steele (Suppl. 6, p. 64).
174. *Spiraea salicifolia* L.
The records under this name belong under *S. latifolia* of the 1919 Flora; *S. salicifolia* is now known to be an Asiatic species.
175. *Rubus villosus* var. *humifusus* Torr. and Gray.
Various localities, E. S. Steele (Suppl. 6, p. 64).
175. *Rubus trivialis* Michx.
Bennings, Hyattsville, E. S. Steele (Suppl. 6, p. 64).
176. *Potentilla reptans* L.
Brightwood, E. L. Greene (Suppl. 5, p. 11).
177. *Agrimonia pubescens* var. *bicknellii* Kearney.
Linnaean Hill Road, E. S. Steele (Suppl. 6, p. 65).
179. *Crataegus rotundifolia* (Ehrh.) Borck.
Riverdale, Tenleytown, E. S. Steele (Suppl. 6, p. 66).
179. *Crataegus flava* Ait.
South Arlington, E. S. Steele (Suppl. 6, p. 66).

180. **Prunus instititia** L.
Roadside above Bennings (1881 Flora, p. 77).
- 180 **Prunus armeniaca** L.
Found in several places growing without cultivation (1881 Flora, p. 76).
186. **Meibomia glabella** Michx.
Hillside above First Lock; Woodley Park, E. S. Steele (Suppl. 6, p. 66).
187. **Meibomia lineata** Michx.
Suitland, E. S. Steele (Suppl. 6, p. 66).
195. **Chamaesyce hirsuta** (Torr.) Arthur.
Great Falls and Marshall Hall, Md., Theo. Holm (Suppl. 5, p. 16).
199. **Ilex glabra** Gray.
Swamp beyond Silver Hill, G. W. Oliver (Suppl. 3, p. 110); between Camp Spring and Surrattsville, G. W. Oliver, W. T. Swingle, M. B. Waite (Suppl. 4, p. 33); again collected in this region (near Clinton) in 1928 by Theo. Holm.
200. **Acer saccharum** var. **nigrum** (Michx.) Britt.
Island above Feeder Dam, F. V. Coville (Suppl. 3, p. 111).
200. **Acer pseudo-platanus** L.
Recorded as spontaneous along New-cut Road by E. S. Steele (Suppl. 6, p. 69).
213. **Epilobium coloratum** var. **umbrosum** Haussk.
Bethesda, E. S. Steele (Suppl. 6, p. 72).
230. **Apocynum androsaemifolium** L.
Besides the single locality given in the Flora for this species, not formally admitted to the list, are William Hunter's record for Woodlawn, Va. (Suppl. 2, p. 108); L. F. Ward and Theo. Holm's for Corcoran Woods (Suppl. 3, p. 118); and Theo. Holm's for South Brookland (Suppl. 4, p. 36).
234. **Convolvulus sepium** var. **americanum** Sims.
Rosslyn, Va., Theo. Holm (Suppl. 3, p. 120); Bunker Hill Road, Theo. Holm (Suppl. 5, p. 14).
246. **Lycopus europaeus** L.
Virginia shore above Aqueduct Bridge, E. S. Steele (Suppl. 6, p. 77).
246. **Mentha rotundifolia** L.
Weed in Agricultural Grounds, E. S. Steele (Suppl. 6, p. 77).
247. **Physalis philadelphica** Lam.
Woodley Park, Geo. B. Sudworth (Suppl. 3, p. 121); opposite mouth

of Cabin John's Run, G. F. Hicks (Holm. Suppl. 4, p. 37). This may be *subglabrata* MacKenzie and Bush.

252. **Veronica agrestis** L.
Accotink, Wm. Hunter (Suppl. 3, p. 121); Catholic University, Theo. Holm (Suppl. 5, p. 15).
265. **Sonchus arvensis** L.
Brookland, Theo. Holm (Suppl. 5, p. 14).
267. **Hieracium marianum** Willd.
Opposite south end of Anlostan Island, E. S. Burgess (Suppl. 3, p. 117); Virginia above Aqueduct Bridge, E. S. Steele (Suppl. 6, p. 80).
274. **Eupatorium purpureum** var. **amoenum** Pursh.
Rock Creek, F. H. Knowlton (Suppl. 2, p. 107).
274. **Eupatorium perfoliatum** var. **truncatum** Gray.
Woodley Park, E. S. Burgess (Suppl. 3, p. 114).
275. **Eupatorium semiserratum** DC.
Great Falls, Theo. Holm (Suppl. 4, p. 35).
275. **Eupatorium aromaticum** var. **melissoides** Gray.
Woodley Park, E. S. Burgess (Suppl. 3, p. 114).
275. **Laciniaria graminifolia** var. **dubia** Gray.
(1881 Flora, p. 56); recorded under the name *pilosa* Britton from various Magnolia Bogs (McAtee, W. L., Bul. 1, Biol. Soc. Wash., 1918, p. 83).
278. **Solidago altissima** var. **procera** Ait.
Spout Run, E. S. Burgess (Suppl. 3, p. 114); Bethesda, E. S. Steele (Suppl. 6, p. 83).
278. **Solidago juncea** var. **ramosa** Porter and Britton.
Glen Echo Railroad, E. S. Steele (Suppl. 6, p. 83).
280. **Aster azureus** Lindl.
Terra Cotta, E. S. Burgess (Suppl. 3, p. 115).
281. **Aster lucidulus** (A. Gray) Wiegand.
Terra Cotta, H. W. Henshaw (Suppl. 3, p. 115); abundant along Potomac River; a good species near *A. puniceus*; runs to *A. laevis* in the local key, Edgar T. Wherry.
281. **Aster puniceus** var. **firmus** Nees.
Brick Haven; foot of First St., E. S. Steele (Suppl. 6, p. 84).
281. **Aster laevis** var. **cyaneus** Gray.
1881 Flora (p. 88).
281. **Aster novi-belgii** var. **elodes** T. and G.
Common, E. S. Steele (Suppl. 6, p. 84).

281. **Aster salicifolius** Ait.
Various localities (1881 Flora, p. 88; E. S. Steele, Suppl. 6, p. 84).
282. **Aster paniculatus** var. **acutidens** Burgess.
Potomac Flats, E. S. Steele (Suppl. 6, p. 84).
282. **Aster ericoides** var. **villosus** Torr. and Gray.
Woodley Park, Lester F. Ward (Suppl. 1, p. 85); Lobelia Run, Lester F. Ward (Suppl. 2, p. 107).
282. **Doellingeria umbellatus** var. **latifolius** Gray.
Recorded (as var. *humilis* Willd.) at Terra Cotta, Bennings, etc., E. S. Steele (Suppl. 6, p. 84).
285. **Polymnia canadensis** var. **radiata** Gray.
Glen Echo, E. S. Steele (Suppl. 6, p. 85).
285. **Heliopsis scabra** Dunal.
Spout Run, E. S. Burgess (Suppl. 3, p. 116).
287. **Helianthus microcephalus** T. and G.
Cowden, Va., E. S. Steele (Suppl. 6, p. 85).
287. **Helianthus hirsutus** Raf.
E. S. Steele (Suppl. 6, p. 85).
290. **Tanacetum vulgare** var. **crispum** L.
Brightwood, Great Falls, E. S. Steele (Suppl. 6, p. 86).
292. **Cirsium pumilum** (Nutt.) Spreng.
Woodley Park, Geo. B. Sudworth (Suppl. 3, p. 117).

III.

Additional records for species, hybrids, and varieties cited from only a single locality in the 1919 Flora. This section totals 65 species, 1 hybrid, and 2 varieties.

56. **Polypodium polypodioides** (L.) Hitch.
Black Pond, Va., 1926, H. S. Barber.
58. **Dryopteris clintoniana** (D. C. Eaton) Dowell.
Broad Branch Valley, Rock Creek Park, 1924, Edgar T. Wherry;
Paint Branch, Md., 1925, J. E. Benedict, Jr.
58. **Dryopteris goldiana** x **marginalis** Dowell.
Rock Creek Bridge, D. C., 1925, Miss J. J. Brainerd.
77. **Panicum wernerii** Scribn.
Rock Creek Park, D. C., June 23, 1918, S. F. Blake.
78. **Panicum spretum** Schult.
Hyattsville; Terra Cotta, Theo. Holm (Suppl. 5, p. 21).

79. ***Panicum addisoni*** Nash.
Suitland, E. S. Steele (Hitchcock and Chase, Contr. U. S. Nat. Herb., 15, 1910, p. 244).
82. ***Muhlenbergia schreberi*** var. ***palustris*** Scribn.
Beaver Dam Branch, E. S. Steele (Suppl. 6, p. 52); Terra Cotta Swamp, Theo. Holm.
84. ***Sphenopholis obtusata*** (Michx.) Scribn.
North Brookland, Theo. Holm (Suppl. 4, p. 41); Reform School, Theo. Holm (Suppl. 5, p. 19); Clarendon and Ballston, Va., Great Falls, Md., 1928, S. F. Blake.
88. ***Panicularia obtusa*** (Muhl.) Kuntze.
Surattsville, Theo. Holm (Suppl. 5, p. 20).
91. ***Hordeum pusillum*** Nutt.
South Washington, E. S. Steele (Suppl. 6, p. 53).
94. ***Cyperus torreyi*** Britton.
Swamp near Riverdale, and low woods near Clinton, Md., Theo. Holm.
94. ***Cyperus retrofractus*** (L.) Torr.
Along the Canal Road, Theo. Holm (Suppl. 3, p. 128); South Brookland, Theo. Holm (Suppl. 4, p. 39).
95. ***Kyllinga pumila*** Michx.
Listed in the Flora only from the now extinct Holmead Swamp; occurs in various Magnolia Bogs, W. L. McAtee; Marshall Hall, Theo. Holm (Suppl. 5, p. 17).
96. ***Eleocharis olivacea*** Torr.
Holmead Swamp being obliterated, E. S. Steele's record of this plant at one mile north of Berwyn can be cited as additional to the only other mentioned in the Flora (Suppl. 6, p. 54); has been collected also at Clinton, Md., Theo. Holm.
99. ***Rynchospora axillaris*** (Lam.) Britt.
Swamps around Surattsville (Clinton) and Silver Hill, Theo. Holm (Suppl. 4, p. 39); various localities, Theo. Holm (Suppl. 5, p. 18); occurred also in Holmead Swamp (Suppl. 3, p. 128).
100. ***Scleria pauciflora*** Muhl.
Flora states "frequent above the fall line." Lakeland and one or two other localities given by E. S. Steele (Suppl. 6, p. 55) are below the fall line.
100. ***Scleria pauciflora*** var. ***caroliniana*** (Willd.) Wood.
Near Hyattsville, and Cheverly, Md., S. F. Blake.
108. ***Carex conjuncta*** Boott.
High Island, Theo. Holm (Suppl. 4, p. 40).

112. **Carex typhina** Michx.
Hyattsville, Theo. Holm (Suppl. 5, p. 19); near Clinton, Md., Theo. Holm.
113. **Carex bullata** Schkuhr.
Beaver Dam Branch, Reform School (1881 Flora, p. 130); Brightwood, E. S. Steele (Suppl. 6, p. 55).
122. **Muscari botryoides** (L.) Mill.
Sandy Landing, Theo. Holm (Suppl. 5, p. 17).
129. **Habenaria cristata** (Michx.) R. Br.
College Park, 1924, Wild Flower Preservation Society.
130. **Ibidium plantagineum** (Raf.) House.
Black Pond, Va., 1922, Mrs. Nellie C. Knappen.
135. **Comptonia peregrina** (L.) Coulter.
A large colony grows on a hill along Bullneck Run, Va., E. A. Preble; another is near mouth of Scott's Run, Va., O. M. Freeman; and the plant is abundant near Odenton, Md., W. L. McAtee.
149. **Iresine rhizomatosa** Standley.
Mineshoe Island, 1922, Clarence R. Shoemaker.
155. **Cabomba caroliniana** A. Gray.
Abundant in Susquehanna Run, Prince George's County, Md., Sept. 29, 1923, S. F. Blake and W. W. Diehl.
157. **Anemone canadensis** L.
Hunting Creek Valley west of Alexandria, Va., 1926, Mrs. Flagg.
166. **Radicula hispida** (Desv.) Britton.
Chain Bridge Flats, Geo. B. Sudworth (Suppl. 3, p. 108); Marshall Hall, Theo. Holm (Suppl. 5, p. 9); Jackson City, E. S. Steele (Suppl. 6, p. 64).
175. **Rubus odoratus** L.
Vicinity of National Observatory, Geo. B. Sudworth (Suppl. 3, p. 111).
176. **Geum hirsutum** Muhl.
Ammendale, 1924, Edgar T. Wherry; Soldiers' Home, July 24, 1928, S. F. Blake.
177. **Malus coronaria** (L.) Mill.
South Brookland, Robert Ridgway (Suppl. 4, p. 34); and Eckington, E. S. Steele (Suppl. 6, p. 65).
178. **Aronia melanocarpa** (Michx.) Britton.
Flora states "region of Four-mile Run; perhaps elsewhere." This seems to be the most generally distributed of our choke-berries, W. L. McAtee.
179. **Crataegus monogyna** Jacq.
Corcoran Woods, Theo. Holm (Suppl. 3, p. 112).

184. *Lotus corniculatus* L.

Compost heap, Arlington Farm, Va., June 16, 1928, W. L. McAtee.

188. *Vicia hirsuta* (L.) S. F. Gray.

Kendall Green, Chickering (1881 Flora, p. 76); Potomac Flats; Anacostia, E. S. Steele (Suppl. 6, p. 67).

189. *Lathyrus myrtifolius* Muhl.

Marshes of the Potomac below Washington, as at New Alexandria and Accotink, Edgar T. Wherry.

191. *Geranium dissectum* L.

Waste land, Washington, D. C., June 6, 1913, S. F. Blake.

195. *Crotonopsis linearis* Michx.

Abundant by roadside near Bailey's Crossroads, Fairfax Co., Va., Oct. 15, 1929, S. F. Blake.

197. *Poinsettia dentata* (Michx.) Small.

The Flora gives two localities which are so near together as to be virtually one; a remote one is railroad embankment at Brookland, D. C., Theo. Holm; the plant occurs also on Scott's Island, Edgar T. Wherry.

199. *Schmaltzia crenata* (Mill.) Greene.

Only one station is given in the Flora; additional is a clump just below Great Falls, Va., 1922, Edgar T. Wherry; worth mentioning, though beyond local flora range, is the abundance of this plant where the highway crosses Goose Creek, Va., near its mouth, Aug. 9, 1924, W. L. McAtee.

202. *Ampelopsis arborea* (L.) Rusby.

Fort Washington, Md., 1927, Edgar T. Wherry.

212. *Lythrum salicaria* L.

West Potomac Park, in rough land near sea wall, July 15, 1928, W. L. McAtee.

213. *Ludwigia hirtella* Raf.

Only the extirpated Holmead Swamp is cited in the Flora, which states "not collected recently." It has been rediscovered, however, east of Laurel, 1924, Edgar T. Wherry.

214. *Trapa natans* L.

The Flora records this only from the now destroyed Fish Ponds and states "now extinct." It was common, however, below Marshall Hall, Md., June 28, 1927, C. C. Sperry; and has been collected near Susquehanna Run, Md., Sept. 29, 1923, S. F. Blake and W. W. Diehl; at Fox Ferry, D. C., and was abundant in bay at mouth of Oxon Run, Md., Sept. 16, 1924, S. F. Blake, Earl V. Shannon, Edgar T. Wherry; also at Gunston Cove, H. S. Barber, and south end of Highway Bridge, Va., June 19, 1929, O. M. Freeman.

215. **Scandix pecten-veneris** L.
Seabrook, Md., Walter H. Evans (Suppl. 5, p. 11); Potomac Park, D. C., along railroad, April 15, 1921, O. M. Freeman.
217. **Eryngium aquaticum** L.
Abundant in the field between the Conduit Road and Stubblefield Fall, Robert F. Griggs.
218. **Heracleum lanatum** Michx.
Recorded from High Island in the Flora which reads "probably extinct now." It still occurs at several places along the canal, Edgar T. Wherry; and F. W. Hunnewell collected it on Potomac Flats, June, 1919.
220. **Cornus alternifolia** L.
Virginia opposite Plummers Id., May 9, 1926, S. F. Blake; Soapstone Quarry, Va., opposite Glen Echo, W. L. McAtee.
220. **Cornus femina** Mill.
Occoquan, Va., Nov. 18, 1929, Neil Hotchkiss.
221. **Pyrola elliptica** Nutt.
Garrett Park, Theo. Holm (Suppl. 4, p. 36).
223. **Rhododendron maximum** L.
There is a large colony on south bank of Bull Run just above Occoquan Village, W. L. McAtee.
228. **Spigelia marylandica** L.
Seven Locks, Md., June 22, 1924, A. K. Fisher.
229. **Sabbatia campanulata** (L.) Torr.
Bog at Virginia Highlands, 1920, site destroyed, C. R. Shoemaker; besides the Falls Church station mentioned in the 1919 Flora, which has also been destroyed, there is another along the electric railroad west of West Falls Church, Edgar T. Wherry, 1927.
237. **Heliotropium europaeum** L.
Near Aqueduct Bridge, M. S. Bebb (Suppl. 1, p. 86).
238. **Myosotis scorpioides** L.
Well established in brooks near Burnt Mills, 1927, Edgar T. Wherry.
244. **Monarda fistulosa** L.
Not uncommon in this region, especially in the Piedmont; Chevy Chase, 1923, Edgar T. Wherry; Cherrydale, Va., Conduit Road, Md., near Glen Echo, O. M. Freeman.
252. **Veronica chamaedrys** L.
Near Soldiers' Home, Theo. Holm (Suppl. 5, p. 15).
254. **Pedicularis lanceolata** Michx.
Fox Ferry Road, Md., May 17, 1928, W. L. McAtee.

264. *Apargia autumnalis* (L.) Hoffm.
Brookland, Theo. Holm (Suppl. 5, p. 13).
264. *Hypochaeris radicata* L.
Clump in lawn, Clarendon, Va., 1928, S. F. Blake; also Bethesda, Md., Oct. 5, 1929, O. M. Freeman.
275. *Eupatorium serotinum* Michx.
One clump in wall of the tidal basin, Potomac Park, Washington, Nov. 1, 1927, S. F. Blake.
275. *Grindelia squarrosa* (Pursh.) Dunal.
Arlington Farm, Va., 1922, Lillian Cash; July 12, 1929, O. M. Freeman.
289. *Bidens connata* Muhl.
Accotink, W. Hunter (Suppl. 3, p. 116); Eckington and Brookland, Theo. Holm (Suppl. 5, p. 13); Arlington and Bennings, E. S. Steele (Suppl. 6, p. 85).
289. *Galinsoga caracasana* (DC) Schultz Bip.
Between Chain Bridge and Lock No. 1; also Plummers Id., Md., S. F. Blake.
290. *Anthemis tinctoria* L.
Bradley Lane, Chevy Chase, Md., Edgar T. Wherry.
290. *Artemisia vulgaris* L.
Hyattsville, Theo. Holm (Suppl. 5, p. 13).
291. *Mesadenia reniformis* (Muhl.) Raf.
The Flora gives Ward's locality (High Id.) only and states "probably now extinct." Knowlton later recorded it from Alexander Island, J. A. Allen (Suppl. 2, p. 130).
291. *Senecio vulgaris* L.
Uniontown, Lester F. Ward (Suppl. 1, p. 85); Potomac Flats, G. H. Hicks (Suppl. 4, p. 35).
291. *Senecio obovatus* Muhl.
Burnt Mills, Md., 1928, J. E. Benedict, Jr.; near Cabin John, Md., 1918, 1920, S. F. Blake.
292. *Cirsium muticum* Michx.
West Falls Church, near the interurban station, 1922, Edgar T. Wherry.
293. *Centaurea vochinensis* Bernh.
Good-sized colony in a vacant lot, Clarendon, Va., Aug. 13, 1928, S. F. Blake.

IV.

Miscellaneous additions and corrections to the 1919 Flora.

53. *Lygodium palmatum* (Bernh.) Swartz.

The colony east of Riverdale is dwindling rapidly; this seems to be due not to vandalism but to neutralization of the acidity of the soil by lime and fertilizers washed down from adjoining cultivated fields. Edgar T. Wherry.

55. *Camptosorus rhizophyllus* (L.) Link.

Stations within the District of Columbia itself are south wall of Oak Hill Cemetery, 1923, Emily W. Dinwiddie, and a boulder above Beach Drive, Upper Rock Creek Park, 1925, Mrs. Nellie C. Knappen.

55. *Asplenium ebenoides* R. R. Scott.

A hybrid between *Camptosorus rhizophyllus* and *Asplenium platyneuron* which should not have a name of its own apparently indicating specific rank, nor be given a formal place in the list.

56. *Polypodium vulgare* L.

Most recent authors agree in treating the form in the Eastern United States as a species *P. virginianum* L. distinct from the European *P. vulgare*. (See especially Fernald, *Rhodora*, 24, 1922, p. 141.)

59. *Lycopodium obscurum* L.

The more frequent variety is var. *dendroideum* (Michx.) Eaton; the typical variety has been found only near Kensington, Md., and Fort Humphreys, Va., Edgar T. Wherry.

61. *Pinus strobus* L.

A fine grove including all stages from trees two feet in diameter to seedlings on the bank of the Potomac just above Broad Creek, Va., W. L. McAtee; a good stand of fine trees some 2 feet in diameter on Northwest Branch above Avenel, Robert F. Griggs.

61. *Pinus taeda* L.

Sand Point, Va., W. L. McAtee.

61. *Pinus echinata* Mill.

Next to *P. virginiana* this is the most common pine on the Piedmont Plateau; it is especially abundant near Chevy Chase, and the real estate subdivision, Pinehurst, owes its name to this species, here known as Foxtail Pine, Edgar T. Wherry.

79. *Panicum scoparium* Lam.

1919 Flora states "below the fall line"; F. L. Scribner collected it at Great Falls (Suppl. 4, p. 42).

85. *Gymnopogon ambiguus* (Michx.) B. S. P.

"East of the fall line" according to the 1919 Flora; Theo. Holm reports it at Great Falls, Va.

96. *Eleocharis engelmanni* Steud.

1919 Flora restricts it to "south of Washington"; Ward's locality, Sandy Landing (Suppl. 1, p. 87) is Dickey's Landing, a short distance below Great Falls; Steele (Suppl. 6, p. 54), gives also Howard Hill Reservoir.

110. *Carex gynandra* Schwein.

Reduced to a variety of *C. crinita* Lam. by C. F. Weatherby (Rhodora, 25, p. 18, Feb., 1923).

110. *Carex aquatilis* Wahl.

According to G. P. Van Eseltine, who prepared the account of the Carexes in the 1919 Flora, this entry in the list pertains to *C. strictior* MacKenzie.

111. *Carex davisii* Schwein. and Torr.

Theo. Holm remarks that while he may have collected this only once, as it is a perennial, he found it every time that he visited Great Falls and looked for it.

113. *Arisaema pusillum* (Peck) Nash.

This form has many distinctive features, thriving in much more acid soil than *A. triphyllum*, and blooming 2-3 weeks later. Edgar T. Wherry.

118. *Juncus marginatus* Rostk.

K. K. MacKenzie (Bull. Torrey Club, vol. 56, p. 27-28, Jan., 1929) has given the new name *Juncus coriaceus* MacKenzie to the plant universally known as *J. marginatus*.

119. *Juncus canadensis* J. Gay.

MacKenzie (op. cit. pp. 29-31) revives the name *Juncus longicaudatus* (Engelm.) MacKenzie for the plant generally known as *J. canadensis*.

119. *Juncoides campestre* (L.) Kuntze.

Theo. Holm considers the local plant to be a species, *Luzula multiflora* (Ehrh.) Lej., distinct from *J. campestre* and varieties (Rhodora, 28, pp. 133-138, 3 figs., August, 1926). He reports the form *bulbosum* as common in sandy soil near Clinton, Md.

122. *Erythronium albidum* Nutt.

1919 Flora states "above Little Falls"; H. M. Smith's station at Vis-a-vis Landing was opposite Three Sisters Id. (Suppl. 2, p. 131).

122. *Muscari racemosum* (L.) Mill.

Bayard Long says "Probably it is as frequent along the Potomac above the city of Washington as anywhere in America." (Rhodora 24, p. 17, Jan., 1922.)

125. *Narcissus biflorus* Curtis.

Near Kalorama Heights, E. S. Steele (Suppl. 6, p. 59). In the 1919 Flora the comment on this record is "probably a persistent garden bulb," although Steele distinctly states "a genuine escape, as a good many plants were found scattered about a grassy field." Regardless of this particular case, denying *Narcissus* a formal place in the catalogue of our flora seems cavalier treatment for a species that has persisted and spread without cultivation in some localities for nearly 150 years. A case in point is the site of Belvoir Mansion in the Fort Humphreys Reservation. *Narcissus* is abundant about the ruins of this celebrated colonial home which was burned in the 1780's.

129. *Habenaria flava* (L.) A. Gray.

The plant occurring here is *H. scutellata* Nuttall which by some students is given specific rank, Edgar T. Wherry.

131. *Corallorrhiza wisteriana* Conrad.

A colony remote from the Potomac occurs in a ravine near Pierce Mill, Mrs. Nellie C. Knappen, 1924.

132. *Salix pentandra* L.

Persistent and spreading from an old osiery at Laurel. Specimen collected, May 20, 1928, by W. L. McAtee, identified by C. R. Ball.

133. *Salix wardii* Bebb.

Camillo Schneider lists this as *S. longipes* var. *wardii* (Journ. Arn. Arb. 1, No. 1, July, 1919, p. 28). This change affects also the combination for the hybrid with *S. nigra*.

135. *Myrica carolinensis* Mill.

There are two colonies in dry woods in upper Rock Creek Park, Mrs. Nellie C. Knappen, 1925.

140. *Quercus macrocarpa* Michx.

The Ward (1881 Flora, p. 112) and Steele (Suppl. 6, p. 60) records for this tree do not seem adequately recognized by the statement that the species "is sometimes planted within our limits" (1919 Flora, p. 140).

141. *Ficus carica* L.

Should be given a regular place in the list; trees persist indefinitely here (e. g. one growing from beneath northeastern corner of Bureau of Entomology Building), and sometimes even bear fruit.

155. *Nymphaea*.

M. L. Fernald advocates *Nymphozanthus* as the correct generic name for the yellow pond lily. (Rhodora, 21, pp. 183-188, Oct., 1919).

155. *Brasenia schreberi* Gmel.

Is abundant in the ponds at Wasena Park from which gravel for the filter beds was taken, Robert F. Griggs.

157. *Delphinium tricorne* Michx.

Far from being "almost extinct" this species occurs by the hundreds on islands in the upper Potomac, Edgar T. Wherry.

158. *Trautvetteria carolinensis* (Walt.) Vail.

Occurs on rock ledges just below Great Falls, Va., 1921, Edgar T. Wherry.

160. *Jeffersonia diphylla* (L.) Pers.

1919 Flora restricts this to "Islands of the Potomac"; it has been found elsewhere, as at mouth of Scott's Run, Va., Theo. Holm (Suppl. 5, p. 9).

165. *Erysimum*.

The character given in key as to hairiness of *Erysimum* does not agree entirely with what is said of the plant on page 167.

166. *Radicula obtusa* (Nutt.) Greene.

"Localities not indicated"; Ward gave near Washington Monument (1881 Flora, p. 64).

167. *Thlaspi arvense* L.

1919 Flora states "not collected recently"; it has, however, since been found on a railroad embankment in Washington, May 8, 1918, by F. W. Hunnewell, at Dyke, Va., May 18, 1921, W. L. McAtee, and Theo. Holm has collected it in old fields near Clinton, Md.

179. *Crataegus uniflora* Muenchh.

1919 Flora restricts to "woods along upper Potomac." Silver Hill, G. W. Oliver, has been recorded (Holm, Suppl. 3, p. 112).

180. *Prunus cuneata* Raf.

An earlier name is *P. susquehanae* Willd. (M. L. Fernald, *Rhodora*, 25, p. 71, May, 1923).

188. *Vicia sativa* L.

1919 Flora states "a species so far not found here." Material collected along Fox Ferry Road, Md., May 17, 1928, by W. L. McAtee has been determined as *V. sativa* by Roland McKee.

192. *Zanthoxylum americanum* Mill.

1919 Flora ranks this only as an escape from cultivation; the plant is abundant on Mineshoe Island, however, where it can scarcely be other than native, C. R. Shoemaker.

196. *Tithymalopsis marylandica* (Greene) Small.

A hybrid between *T. ipecacuanhae* and *T. corollata* (Theo. Holm, *Amer. Midl. Nat.*, 9, pp. 149-175, July, 1924) which should, therefore,

not have a formal entry in the list of local plants. Homer D. House remarks that this form probably is that named *Euphorbia uniiflora* by Rafinesque. House applies the generic name *Agaloma* to all our *Tithymalopsis* (Amer. Midl. Nat., 7, pp. 130-131, Sept., 1921).

204. **Ascyrum stans** Michx.

1919 Flora gives it as a plant of dry sandy soil; it is at least equally characteristic of bogs.

211. **Opuntia.**

The correct name of the common prickly pear of our region is *Opuntia compressa* (Salisbury) Macbride, J. N. Rose.

212. **Rhexia mariana** L.

1919 Flora records it from northeast of Washington. Accotink, W. Hunter (Suppl. 3, p. 112) and Marshall Hall, E. S. Steele (Suppl. 6, p. 11) are in other directions.

223. **Neopieris.**

Rehder includes this under *Xolisma* (Journ. Arn. Arb. 5, No. 1, pp. 49-51, Jan., 1924).

229. **Bartonia paniculata** (Michx.) Robinson.

Occurs in moist woods, not bogs, near Dyke, Va., Edgar T. Wherry, 1918.

236. **Nyctelea ambigua** (Nutt.) Standley.

1919 Flora restricts this to "above the fall line." E. S. Burgess's station (Suppl. 3, p. 120), Poplar Point, part of what we now call Bolling Field, is in the Coastal Plain.

242. **Scutellaria serrata** Andr.

1919 Flora restricts this to "above the fall line"; Theo. Holm reports it as rare near Clinton, Md.

243. **Dracocephalum denticulatum** Ait.

Grows in wet alluvial soil, and is so different in aspect from *D. virginianum* of dry slopes, that it seems advisable to regard them as distinct, Edgar T. Wherry.

245. **Koellia mutica** (Michx.) Britton.

Restricted to the Coastal Plain in the 1919 Flora but occurs also on the Piedmont as at Spring Hill, Va., and Glenmont, Md., Edgar T. Wherry.

245. **Cunila origanoides** (L.) Britt.

Homer D. House uses the generic name *Mappia* for this plant (Amer. Midl. Nat. 8, No. 2, March, 1922, pp. 61-64).

251. **Ilysanthes.**

The key characters in the 1919 Flora are transposed. According to F. W. Pennell (Torreya, 19, p. 149, Aug., 1919) the correct name

for *I. attenuata* (Muhl.) Small is *I. inaequalis* (Walt.) Pennell. *I. dubia* in the 1919 Flora is said to occur on "wet soil along the Potomac," to which Theo. Holm adds wet places near Clinton, Md.

252. *Veronica scutellata* L.

1919 Flora restricts this to "upper Potomac." Recorded from Marshall Hall and New Alexandria, Va., F. W. Pennell (Suppl. 6, p. 14).

254. *Bigonia radicans* L.

Two "strongly marked varieties" were described but not named by Robert Ridgway (Garden and Forest, pp. 453-454, Nov., 1896). These were the orange- and red-flowered forms, respectively. A yellow-flowered form also occurs near Mount Vernon according to William Hunter.

262. *Valerianella woodsiana* (Torr. and Gray) Walp.

1919 Flora gives from High Island to Chain Bridge; E. P. Killip and Neil Hotchkiss collected it in Virginia opposite Plummers Island in May, 1925.

262. *Valerianella chenopodifolia* (Pursh.) DC.

Recorded only from above Chain Bridge; common along Fox Ferry Road, Md., May 17, 1928, W. L. McAtee.

274. *Eupatorium purpureum* L.

Later authorities seem to agree that the two forms of *Eupatorium* grouped under the name *purpureum* in the 1919 Flora should be recognized as species, but differ as to the names to be applied to them. K. M. Wiegand uses the names *E. verticillatum* Lamarck and *E. purpureum* L. (Rhodora, 22, pp. 64-68, April, 1920), and K. K. MacKenzie uses for them respectively *E. purpureum* and *E. maculatum* L. (Rhodora, 22, pp. 157-165, Oct., 1920).

277. *Solidago*.

The characters as to racemes for species 6 and 18 are transposed in the key, Edgar T. Wherry.

281. *Aster novae-angliae* L.

1919 Flora restricts it to upper Potomac. There are numerous stations elsewhere; Potomac Flats has been published (Suppl. 3, p. 115; Suppl. 6, p. 84).

283. *Antennaria solitaria* Rydb.

Grows under *Kalmia* bushes near Bullneck Run, Va., Edgar T. Wherry, 1925.

284. *Gnaphalium uliginosum* L.

Flora states "not collected since 1884"; Holm in 1901 records it from Hyattsville and Marshall Hall (Suppl. 5, p. 13).

287. **Helianthus.**

In line 16 for "copiously" read more or less, Edgar T. Wherry.

287. **Helianthus angustifolius** L.

1919 Flora states "northeast of Washington"; the plant occurs in most bogs, however; Holm reported it from near Fort Myer (Suppl. 5, p. 13), and W. L. McAtee has collected it in the bog adjoining cemetery in Alexandria, localities not "northeast."

288. **Coreopsis tinctoria** L.

1919 Flora states "reported by Ward as escaped in a few places but has not been collected recently." It was also reported, however, by Steele 20 years later (Suppl. 5, p. 85), and collected by McAtee, July, 1904, so would seem to deserve a formal place in the list.

289. **Bidens bidentoides** (Nutt.) Britt.

This entry of the 1919 Flora and of Supplement 5 (p. 13) is *B. con-nata* var. *anomala* Farwell. (S. F. Blake, *Rhodora*, 27, pp. 34-35, Feb., 1925.)

291. **Senecio obovatus** Muhl.

The presence of this plant at Great Falls, Va., is confirmed by Edgar T. Wherry; there is a well developed colony on rocks right at the falls (1924).

V.

Records of certain transplanting operations.

Confusion already has arisen because of the collecting of transplanted specimens by persons not knowing their origin, and it is considered desirable to place on record all that can be learned about such operations. Information additional to that here given will be appreciated.

The most extensive transplantations into an apparently natural environment, of which we are aware, are those made on the property of the Washington Biologists' Field Club, Seven Locks, Md. The Club owns Plummer's Island, and the adjacent mainland overlapping the island at both ends. Few plants have been introduced to Plummer's Island itself, except in a small wild flower garden, those known to the writer being:

Polypodium polypodioides
Tsuga canadensis
Ilex opaca

Epigaea repens
Gaultheria procumbens
Rhododendron maximum

On the Maryland shore nearby the following things have been transplanted, and most of them are now growing. Information on this point is largely from Dr. A. K. Fisher, who has had most to do with the work.

<i>Lygodium palmatum</i>	<i>Aronia melanocarpa</i>
<i>Pellaea atropurpurea</i>	<i>Prunus virginiana</i>
<i>Pinus taeda</i>	<i>Ilex opaca</i>
<i>Pinus pungens</i>	<i>Ceanothus americanus</i> ; this formerly grew here naturally
<i>Tsuga canadensis</i>	<i>Vitis labrusca</i>
<i>Taxodium distichum</i>	<i>Viola pedata</i>
<i>Veratrum viride</i>	<i>Aralia spinosa</i>
<i>Iris cristata</i>	<i>Cornus alternifolia</i>
<i>Iris verna</i>	<i>Clethra alnifolia</i>
<i>Cypripedium acaule</i>	<i>Epigaea repens</i>
<i>Comptonia peregrina</i>	<i>Gaultheria procumbens</i>
<i>Hicoria ovata</i>	<i>Rhododendron maximum</i>
<i>Betula lenta</i>	<i>Dodecatheon meadia</i>
<i>Quercus macrocarpa</i>	<i>Mentha spicata</i>
<i>Caltha palustris</i>	<i>Catalpa bignonioides</i>
<i>Magnolia virginiana</i>	<i>Lonicera sempervirens</i>
<i>Liquidambar styraciflua</i>	<i>Viburnum nudum</i>
<i>Aruncus sylvestris</i>	

The following species have been planted in the largest of the Powder-mill Bogs (No. 1).

<i>Schizea pusilla</i>	<i>Sarracenia purpurea</i>
<i>Abama americana</i>	<i>Sarracenia flava</i>
<i>Drosera filiformis</i>	<i>Sarracenia drummondii</i>

In this connection it may be mentioned that William Hunter for years transplanted chiefly woody plants to the National Zoological Park, where it is not safe therefore to assume that all of the trees, shrubs, and climbers are indigenous.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONNOTES ON SOME AMPHIBIANS IN WESTERN NORTH
AMERICA.

BY GEORGE S. MYERS.

Definite information concerning the amphibians of Western North America is rather recent, not only along the lines of habits and of distribution but even of taxonomy. The work of Camp (1915-1917) established a fundamental systematic groundwork in those cases which most needed it, and with the publication of Storer's *Synopsis of the Amphibia of California* in 1925 many life-histories and a great amount of distributional data became known for the first time. Slevin's recent work, *The Amphibians of Western North America*, 1928, adds much to our knowledge of distribution.

There are yet considerable gaps to be filled, however, and little apology seems necessary for the present notes. They are largely distributional and are based on the collections of the Natural History Museum at Stanford University which for a time ranked as the most complete on the Pacific Coast. They formed the basis for Van Denburgh's earlier work on western reptiles and to a considerable extent supplied records for his and Slevin's recent monographs. Much interesting material, however, has as yet never been identified or recorded and some of this is here included. A few records are based on field work the writer has been able to accomplish during the last two years. No material is recorded which does not appear to add distributional or other data.

Triturus torosus (Eschscholtz).

A large number of metamorphosing water dogs, averaging slightly over 50 mm., were collected about the edges of Lagunita, on the campus, Stanford University, Santa Clara Co., Calif., July 26, 1928. They were

at the water's edge, emerging, and a few under boards a few feet from the edge. Next to *Hyla regilla*, this is the commonest amphibian of the San Francisco Bay region, and, as the Hylas are secretive most of the year, it is easily the most generally known.

For notes on this species at Rancho del Oso, see under *Dicamptodon*.

Ambystoma tigrinum californiense (Gray).

The night of March 9, 1929, at Lagunita, Stanford Campus, in a drizzling rain, a single large male was seen hastily making for the water. He was a hundred yards from the edge when first observed, but as I was not prepared to follow out to any depth to observe his movements he was collected. The cloacal region was greatly swollen, and the animal evidently was in breeding condition. No other specimens were observed, in the water or out, although many may have been present in deeper water. This indicates either a belated individual or a later spawning than of Storer's account. Possibly unusual rainfall conditions may have contributed. (See account under *Ensatina eschscholtzii*.)

We have other specimens of this salamander from Palo Alto and San Jose, Santa Clara Co., Calif. These California *tigrinum* are rather different in appearance from Long Island examples that I have seen, but still more so from some of the large-spotted specimens from the Rockies.

Ambystoma gracile (Baird).

A fine specimen, 185 mm., from Chinook, Pacific Co., Washington, C. H. Gilbert.

Ambystoma macrodactylum (Baird).

Among several specimens from Pullman, Washington, March 31, 1894, J. O. Snyder, is one female with ripe eggs, indicating spawning time.

Dicamptodon ensatus (Eschscholtz).

One adult, 228 mm., from Albion, Mendocino Co., James McMurphy; one adult, 218 mm., from Rancho del Oso, Santa Cruz Co., March 28, 1922, Theodore J. Hoover; 8 gilled larvae, 189-245 mm., from Middle Creek, Siskiyou Co., July 30, 1921, J. O. Snyder and Blake Wilbur; 3 small larvae, 57 to 72 mm., Mt. Lassen, Hollensworth Flat near Shingletown, Shasta Co., June 20, 1900, E. Hughes; all in California.

The large larvae are of interest as throwing some light on the size at metamorphosis. As Storer has suggested, it is apparent that in this form the larvae attain almost or quite adult size before transforming. It appears to be of advantage to such a large salamander to prolong its larval life, for it gains not only in protection from enemies but in escape from dessication, which is possible even in some parts of the redwood forests.

One adult (No. 61) from Steven's Creek Canyon, Santa Clara Co., Calif., is remarkable for its small size, 153 mm.

On March 17, 1929, Mr. Merrill W. Brown and the writer proceeded to Rancho del Oso where we hunted salamanders with the kind permission of

its owner, Prof. Theodore J. Hoover. The ranch comprises the entire valley of Waddell Creek, a small stream flowing directly into the ocean at the northern end of Monterey Bay in Santa Cruz County. Except for a short distance at the mouth, the valley is in the redwood belt, kept continually moist by the dense ocean fogs. Going a few miles up the creek we soon began to find salamanders. *Triturus torosus* was leaving the water by the hundreds and the animals, apparently of at least two-year classes (of 80 or 90 mm. and large adults), were seen everywhere crawling over the ground or found resting under logs. A number of *Ensatina eschscholtzii*, *Aneides flavipunctatus* and *Batrachoseps attenuatus* were taken. Towards the end of the afternoon a light rain began to fall. We stopped at a small branch stream and began turning over logs. Over a little spring, piled on the almost vertical incline of the wet canyon slope, were some long strips of redwood. Clambering up and turning these over I uncovered a large adult *Dicamptodon*. It was the first I had seen alive and its size, together with its strength when seized, will remain a lasting impression. In preservative it measures 220 mm.

Mr. Hoover tells me that *Dicamptodon* is rare, but that individuals are occasionally uncovered when clearing up rubbish in the woods. One such that he obtained is in the collection. He further states that the animal utters a noise or "bark" and says that he has had his attention called to specimens in this way.

Another adult, taken under a board by the roadside along the Santa Cruz-Los Gatos road, 15 miles from Los Gatos and 5 miles from the Big Basin road, March 24, 1929, G. S. Myers, measures 210 mm. with injured tail.

Batrachoseps attenuatus attenuatus (Eschscholtz).

Numbers of these salamanders are to be found under boards or chips about Palo Alto or in the nearby hills wherever there is sufficient moisture. The largest that I have seen measures 140 mm., of which 85 mm. is tail; it was taken on the Stanford Campus by G. M. Kranzthor, March 29, 1929. Also from La Honda, San Mateo Co., March 9, 1929, M. W. Brown and G. S. Myers; Rancho del Oso, Santa Cruz Co., March 17, 1929, Brown and Myers; and Santa Cruz-Los Gatos road, 15 miles from Los Gatos, March 24, 1929, G. S. Myers.

The characteristic manner in which *Batrachoseps* curls up when disturbed reminds one forcibly of the similar habit of *Hemidactylium* and suggests that the close relationship assumed by older writers may have some basis in fact.

Mr. Lionel A. Walford has very kindly turned over to me the following observations on the breeding habits of this species as observed by him at Berkeley in 1925.

"When the first rains occur, usually in November or December, *B. attenuatus* comes to the surface for the mating season. I have observed during the winter months a pairing off of individuals, many such pairs being seen close together under rocks and boards. I have seen young as early as October.

"On January 24, 1925, I found some eggs about a foot below the surface of the ground under some dense foliage. There seemed to be no pocket or excavation for the reception of the eggs and they closely resembled the surrounding earth. They were in two groups close together, one of seven eggs and the other of twelve. The eggs were about five or six millimeters in diameter, and appeared round. On February seventh seven individuals were hatched. They broke the other eggs in hatching. Little was left of the broken eggs and it is possible these were eaten. The young were seventeen millimeters in length when hatched and were of the same general color and form as the adults. On March 25 they were 22 millimeters long."

Batrachoseps attenuatus leucopus (Dunn).

One, 80 mm., from Dulzura, San Diego Co., California. This specimen, a male, exhibits swollen areas about the naso-labial grooves, but there appears to be no external manifestation of a glandular swelling in the mental region.

Ensatina eschscholtzii Gray.

On March 9, 1929, Brown and I hunted salamanders at La Honda. The winter rains had been light and none had fallen for a month until that morning. About 500 yards down the creek from the village we began turning over redwood chips and bark. In a half hour's collecting we obtained nine *Ensatinas* and more than twice that many *Batrachoseps*. The steady drizzle had not yet much wet the ground beneath the big redwoods and it was rather dry under the chips. All of the *Ensatinas* were under flat chips or pieces of bark one or two feet long lying rather loosely on the forest floor. None were under deeply embedded slabs or logs. Two of the specimens were young of the year, under 40 mm., while of the seven adults, four were males and three females. All were taken in an area approximately 100 ft. square, this being apparently the one place in the immediate neighborhood where sufficient shelter was to be found.

The upper surfaces of the specimens are of a slightly variable shade of deep burnt orange, this fading to bright orange on the lower parts of the cheeks, sides and tail. On the venter the color is slightly paler, the skin translucent, and the internal organs visible. The proximal half of each leg is of the same bright orange as the sides. The upper eyelids of some of the specimens have an orange infusion and on some there are indications or orange spots on the upper surface of the tail. The iris is black, but directly above the pupil it is suffused with minute metallic greenish-silvery specks. The young *Ensatinas* were more brilliant than the adults. The basal bright orange tone is less obscured above by dark chromatophores.

In captivity the four males were distinctly more active than the females, especially when one attempted to handle them. The swollen region on each side of the snout and the consequent overhanging folds of the upper lip were very noticeable.

In this species the naso-labial groove does not extend to the edge of the

lip, but bifurcates and sends a branch anteriorly and one posteriorly along the swollen part of the lip, these branches soon becoming obsolete. In the female the branches are much less distinct.

Five adults taken at Rancho del Oso (see under *Dicamptodon*) were of a much paler color, being a pale dull brown above and pale yellowish orange beneath. The proximal parts of the legs were yellowish orange. The three young likewise showed none of the brilliant color of the La Honda specimens, resembling the adults. Adults taken in Big Basin, Santa Clara Co., March 24, 1929, and along the Santa Cruz-Los Gatos road, 15 miles from Los Gatos, on the same date, resembled the La Honda ones in coloration. An adult, 113 mm., Salem, Marion Co., Ore., January 29, 1921, C. D. Duncan, adds a locality.

A color description of the young may be of interest. In the La Honda specimens the ground color is bright orange-red. The darker color of the dorsum and distal parts of legs is caused by small dark spots each covering one skin pit. The dots are always on the pits but not all pits are spotted, the dark thus being somewhat irregular. There are a few golden spots on the proximal lighter parts of the legs. There is a very sparse sprinkling of fine white dots over the back and sides. In the Rancho del Oso young the coloration is in every way similar except that the ground color is yellow and the dark of the upper surfaces is deeper, more dark pit-spots being present.

Ensatina sierræ Storer.

A fine specimen, 130 mm., De Sabla Power House, Butte Co., 22 miles northeast of Chico, Calif., February 5, 1918, L. M. Edwards. The following are life color notes by Prof. J. O. Snyder. Body dark violet black; feet, ventral sides of limbs and under parts very pale; spots and blotches of body mars orange; proximal segments of legs with yellow infusion; sides of body with many minute spots of silvery white.

Also five smaller specimens from Fyffe, Eldorado Co., Calif., May 13, 1898, Miss J. C. Nichols. These are interesting in that in three examples the spots are extremely reduced, but a few small scattered ones being present on the upper parts of the sides and on the tail. This brings up the question of possible intergradation with *eschscholtzii* and particularly recalls the specimen in the California Academy, also from Eldorado County, which entirely lacks spots and has been referred to *eschscholtzii* (Slevin, 1928, p. 62). With these facts in mind, and judging from preserved material, we might be justified in reducing *sierræ* to subspecific rank. This does not, however, take into account the widely different life colors of the two forms. *Eschscholtzii* in life is burnt orange or dull brown above and light orange beneath, this subject to slight change with temperature, light, and moisture. *Sierræ*, on the other hand, is described as blackish or violet black above with the spots orange and the limbs and underparts pale. In alcohol *eschscholtzii* darkens and our *sierræ*s from Fyffe are brown after many years preservation, but until it can be shown that there is a meeting place in the life colors of the two forms I think we had best

keep them distinct. VanDenburgh (1916, Proc. Calif. Acad. Sci., VI, p. 220) says the ground color of *croceater* (*sierræ*) may vary "from light brown to nearly black," but whether this refers to preserved or to live animals is not plain.

Dunn has recently described the form in the San Jacinto Mountains and southward as a distinct species, *Ensatina klauberi* (1929, Proc. U. S. Nat. Mus., 74, Art. 25, p. 1). That this form¹ is separated from *croceater* (*sierræ*) by the southern extremity of the range of *eschsoltzii* seems at first sight to be clear, but it is not yet wholly certain that a spotted *Ensatina* does not occur in the San Bernardino along with *eschsoltzii*. I have examined a single *klauberi* in the California Academy; it appears blacker and more brilliant than *croceater* (*sierræ*).

Aneides ferreus Cope.

A series of 34 specimens collected by J. O. Snyder and C. V. Burke at Union Bay, Bayne Island, British Columbia, May 16, 1906, ranges from 33 to 117 mm., and forms the bulk of the original lot from which the specimens from this locality in the California Academy and National Museum came. The adult coloration varies somewhat in tone but the mid-dorsal line is always somewhat obscured. The young have a pair of light areas on the snout and head to level of middle of eye, a light stripe on each side of the neck in the parotoid region, a light area on the upper proximal part of each hind leg, and a dorsal light stripe on the tail.

Aneides flavipunctatus (Strauch).

As stated under *Dicamptodon*, we hunted salamanders at Rancho del Oso on March 17, 1929. Three large adults of *flavipunctatus*, 126 to 152 mm., were obtained under logs and slabs, as well as two young, of 41 and 43 mm. The adults were totally black save for one or two small whitish spots on the legs. The young were spotted, resembling spotted adults from northern California. All adults south of San Francisco Bay seem to be unspotted.

In the young the color appears blackish, somewhat pale beneath, with a fine peppering of tiny blue-white flecks, both above and below. Under the binocular it is seen that the skin is finely and evenly covered with small deep pits. The ground color is coal black, while between the pits there is a fine broken golden tracery, each group of radiating lines apparently representing a single golden chromatophore. Over all is an irregular peppering of tiny blue-white spots, each but little larger than a skin pit. On the venter there is no golden tracery and the pits seem to become light, thus giving the lighter color to the under side.

¹The present paper was written before Storer's "Notes on the genus *Ensatina* in California," 1929, Univ. California Publ. Zoöl., 30, No. 16, pp. 443-452, had appeared. I have adopted his name *sierræ* for the Sierra form, agreeing with him in the application of the name *croceater* to the southern species. Storer's records confirm the presence of spotted *Ensatinas* in the San Bernardino, true *croceater* ranging from Ft. Tejon southward. Mr. Klauber has very kindly presented the Stanford Museum with one of the series of *croceater* from Descanso from which the type of *klauberi* was taken. They were obtained by Joe Carter, April 1, 1929.

The three adults were kept alive for some time in a jar. One of the smaller received a deep wound in the back, apparently a bite inflicted by one of its fellows. This species is much more active and lizard-like than *lugubris*. The young, especially, in which the legs are proportionately longer than in adults, move in a quick manner that is startlingly lacertilian.

In appearance the two young were very similar to the only young specimen of *Plethodon glutinosus* which I ever saw. I found it under a log on a hill near Sussex (Deckertown), N. J., and it was of approximately the same size as these small *Aneides*.

Storer (Synop. Amphib. Calif., p. 122) states that the range of *flavipunctatus* is in general inland from that of *lugubris*. Exactly the reverse is true south of San Francisco Bay. Here *flavipunctatus* is limited to the coastal redwood belt, while *lugubris* is generally common only interiorly, in the Santa Clara Valley and in the Inner Coast Range.

Two adults from Murphy's Creek, Santa Clara Co., March 31, 1898, W. K. Fisher; one in bad condition from Sherwoods, Mendocino Co., F. Stephens, both in California.

Aneides lugubris lugubris (Van Denburgh).

One specimen, 140 mm., Anno Nuevo Island, near northern end of Monterey Bay, J. O. Snyder, seems worth recording. It almost entirely lacks the yellow spots.

Large specimens of this species when confined in vivaria for a period without food, frequently severely bite their fellows, particularly on the tails, apparently mistaking those members for worms.

Scaphiopus hammondii Baird.

A series of transforming larvae of this species from near Salinas, Monterey Co., California, May 5, 1922, is in the collection. A newly transformed toad measures 31 mm. from snout tip to vent. This is a considerable extension of the range.

Bufo canagicus canagicus (Pallas).

Rana canagica Pallas, 1831, Zoogr. Rosso-Asiat., III, p. 12.¹

Bufo boreas Baird and Girard, 1852, Proc. Acad. Nat. Sci., Phila., 6, p. 174.

It appears that Pallas's name must supplant that of Baird and Girard for the common toad of the Pacific Coast. Lindholm (1924, Copeia, No. 129, p. 46) has called attention to Pallas's description of *Rana canagica* but he did not attempt an allocation of the name. The only two amphibians known from the region ascribed to *Rana canagica* are *Rana cantabrigensis* and *Bufo boreas boreas*.

I present Pallas's description:

¹Zoographia Rosso-Asiatica, sistens Omnium Animalium in Extenso Imperio Rossico et adjacentibus maribus Observatorum—Recensionem, Domicilia, Mores et Descriptiones, Anatomen atque Icones Plurimorum. Auctore Petro Pallas—Volumen Tertium—Petroli—In officina Caes. Academiae Scientiarum Impress. MDCCXXI. Edit. MDCCXXI.

"5. *RANA canagica*.

"*R. subverrucosa*, supra *virescens*, linea dorsali alba, subtus pallida.

"In insulis Aleuticis inter Camtschatcam et Americam, et in hujus Continentis parte a Rossis occupato observavit, et breviter sic descripsit p. m. D. Merk.

"Descr. „Supra corpus virescens, linea alba a capite per dorsum. Subverrucosa, verrucis *ochreo-pallidis*, in juniore aetate rubescentibus, halone fuscido cinctis. *Subtus pallida, subverrucosa.* (Italics mine.)

Holding in mind the date at which this work was done (before 1811) and the construction of the other descriptions of "Ranae" given by Pallas, there seems not a great deal of doubt regarding the application of the name. The parts of the description italicised seem to me to be referable only to *Bufo boreas*. Surely no one would refer to *Rana cantabrigensis* as in any way warty. Pallas even mentions the color of the warts, and those on the back of *boreas* are well described as "ochreo-pallidis."

Bufo boreas is recorded from the Prince William Sound region, which is considerably farther north than the Aleutians. There thus seems no reason why *boreas* as well as *cantabrigensis* should not occur on the Islands, Kanaga included. But it is also definitely stated that *canagica* inhabits the mainland and I see no reason for not restricting the type locality to the latter area. Whether or not the Alaskan frogs are subspecifically identical with what we have called *B. boreas boreas* from Oregon and Washington must be decided with more abundant material than that available to me.

Among the numerous toads of this form in the Stanford Museum the following seem worth recording. One, Woronofski Island, near Wrangel, Alaska, June, 1900, collector not recorded. One, Beaver River near Beaver, Beaver Co., Utah.

Slevin (1928, Occ. Pap. California Acad. Sci., XVI, p. 93) referred toads from Lake Tahoe to *halophilus*. Three large adults in our collection from Tahoe City, Lake Tahoe, June 27, 1911, Snyder and Richardson, are definitely referable to *canagicus* (= *boreas boreas*).

***Bufo canagicus halophilus* (Baird and Girard).**

The name of the common toad of California, following the change of the northern subspecies, must be as given.

A single large female, 115 mm., taken at night by the writer at Lagunita, on the Stanford Campus, March 9, 1929, approaches the northern subspecies in several ways, firstly in size, secondly in the extreme roughness of the skin between warts, and thirdly in having a heavy fine black mottling between the larger color spots. Dr. T. I. Storer has examined this individual, however, and pronounces it an *halophilus* on the width of the hind foot. The example was seen at a distance to be different from the numerous other toads in the water and was collected on this account.

***Bufo canorus* Camp.**

On the afternoon of June 20, 1928, search was made in the vicinity of Peregoy Meadow (elevation 7,100 feet), Yosemite National Park, for this

toad. Although logs and various kinds of cover were thoroughly examined about the meadow, no adults were found. In small muddy holes in the wet meadow, however, innumerable tadpoles were found. The holes were not more than 6 or 8 inches in diameter and were almost filled with fine mud and vegetation. Several tadpoles were in each hole and the holes were so close as to suggest hoof tracks of a herd of cattle. Seepage water kept them filled. The water was very warm, but must have become rather cold at night. Two sizes of tadpoles were observed, the smaller of about 10 mm., the larger being mature tadpoles of 28 or 30 mm. Some of the latter transformed that night, the tiny toadlets measuring 10 mm.

Tadpoles of the smaller size were also observed on the same day at the first small meadow across the ridge from Chinquapin, on the Glacier Point Road, in a shallow place in a little rivulet which crosses the road. Search at Tamarack Flat and along Tamarack Creek on the 19th failed to reveal any sign of adults or tadpoles.

Storer (1925, Synop. Amph. Calif., p. 42) has figured the mouth of the tadpole of *canorus*.

Hyla arenicolor Cope.

Indian Creek, San Jacinto Mts., Calif., July 19, 1927, D. H. Fry, Jr. Also adults and mature and metamorphosing tadpoles from Palm Springs Canyon, Calif., July 18, 1927, D. H. Fry, Jr. We have other specimens from the latter locality, March 28, 1929, J. H. Wales.

Hyla regilla Baird and Girard.

In the winter of 1928–1929 these were first heard in puddles behind the Museum on the Stanford Campus on December 5, in the afternoon. The first rains were a week before, the first to leave standing water only four days before. At Lagunita they were mating as late as March 9. Specimens at hand from Tahoe City, Lake Tahoe, June 27, 1911, Snyder and Richardson, and Rancho del Oso, Santa Cruz Co., March 17, 1929, Brown and Myers, both in California.

Rana aurora draytonii (Baird and Girard).

These large pond frogs seem to be becoming rare. Large ones are occasionally taken at Lagunita, Stanford Campus.

Rana pretiosa luteiventris Thompson.

One fine specimen, Quinn River near McDermit, Humboldt Co., Nevada, July 30, 1913, J. O. Snyder.

Rana boylei boylei (Baird).

Marshfield, Coos Co., J. O. Snyder, and mouth of Pistol River, Curry Co., August 3, 1899, both in Oregon. Also from Idylwild, Big Sur Road, Monterey Co., Calif., G. S. Myers. Our material from Quincy, Plumas Co., Calif., shows much variation in color and proportions. Some of the speci-

mens approach *sierræ* in the short legs, but though the color varies, it does not approach that of our Yosemite *sierræ*.

These little frogs are fairly common in foothill streams behind Palo Alto. As Camp and Storer have pointed out they are rigidly restricted to streams, *draytonii* and bullfrogs being the only pond frogs of the region.

***Rana boyllii sierræ* Camp.**

Along Tamarack Creek above Tamarack Flat (altitude 6,400 ft.) Yosemite National Park, June 19, 1928, these frogs were occasionally seen. One young was taken. Next day, at Peregoy Meadow (7,100 ft.), in tributaries of Bridal Veil Creek, many large adults and many metamorphosing tadpoles were seen. We also have one adult from Mariposa Big Trees, Yosemite National Park (about 6,500 ft.), C. P. Russell, and another from Tahoe City, Lake Tahoe, Calif. (about 6,300 ft.), June 27, 1911, Snyder and Richardson. These various stations are the lowest on record for this form.

***Rana boyllii muscosa* Camp.**

Of this well marked subspecies we have two fine adults, Indian Creek, San Jacinto Mts., Calif., July 19, 1927, D. H. Fry, Jr.

***Rana catesbeiana* Shaw.**

Bullfrogs are found along San Francisquito Creek, Palo Alto, possibly having come down from Searsville Lake, where, however, they have not up to the present definitely been observed. When the creek rises and fills Lagunita on the Stanford Campus, a few big frogs usually come with the water and are heard throughout the spring. One large adult, March 20, 1929, M. W. Brown, from Lagunita, is in the collection.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



FISHES FROM THE UPPER RIO META BASIN,
COLOMBIA.

BY GEORGE S. MYERS.

Brother Hermano Apolinar Maria, of the Instituto de La Salle in Bogotá, has recently sent me a small but interesting collection of fishes from the headwaters of the Rio Meta on the eastern slope of the Cordillera of Bogotá. The fishes were taken at Guaicaramo, at the junction of the Rio Guavio and the Rio Upia, almost due east of Bogotá and north of Barrigón. The elevation is between 300 and 400 metres and there is direct communication with the Meta through the Upia.

Manuel Gonzales collected on the east slope of the Cordillera along the trail from Bogotá to Villavicencio and as far as Barrigón for Dr. Eigenmann in 1912. These, as well as other considerable collections received from Hermano Apolinar, were reported by Eigenmann in the appendix to his 1922 paper. This remains the compendium of our knowledge of Meta fishes.

Despite this previous work, our knowledge of the tremendous fish fauna of the Orinocan drainage of Colombia is yet extremely fragmentary, and no opportunity should be allowed to pass that promises to add anything of value. The present collection, despite its small size, contains four forms not before known from the region, two of them apparently new. Another one reported previously, but heretofore confused with its representative on the west of the Eastern Andes, is described as new. *Sternarchus leptorhynchus*, known both from Guiana far to the east and from the Dagua and San Juan, across the three ranges of the Andes, on the west, is particularly interesting.

Included with the Guaicaramo collection were three *Rivulus*

magdalene Eigenmann and Henn from El Castañal, a brook in the Upper Magdalena Basin, and two *Pygidium bogotense* Eigenmann from Guasca, north of Bogotá.

GYMNOTIDÆ.

***Sternarchus leptorhynchus* Ellis.**

One specimen, 210 mm. total length, from Guaicaramo.

End of tail regenerated. Eye slightly in advance of middle of head. Anus nearer to vertical of angle of gape than to vertical of pectoral origin. Angle of gape reaching considerably past hind border of eye. These characters are at variance with those given by Eigenmann (1922, p. 175) for specimens from west of the three ranges of the Cordillera, but my example agrees closely with Ellis' original description, based on Guiana material. This is the first record of the species from the Orinoco Basin. It is probable that the population in the San Juan and Dagua Basins will be found to differ somewhat on closer scrutiny.

HEMIODONTIDÆ.

***Parodon apolinari*, sp. n.**

Diagnosis.—A *Parodon* with small head, anterior dorsal fin, and a series of 13 or 14 vertical bars down the sides. Approaching *P. suborbitale* but with a smaller head, deeper body, wider interorbital, and lacking longitudinal lines. Differing from *P. gestri* of Matto Grosso and *P. caliensis* from across the eastern Cordillera in position of dorsal, head length, and other characters.

Holotype.—No. 23725 Stanford University, 89 mm. standard length; Guaicaramo, Rio Guavio, Colombia; January, 1928.

Description.—Dorsal I, 10. Anal I, 7. Pelvic I, 7. Scales 4-34-3,¹ 16 around caudal peduncle, 11 predorsal. Head 5.33 in standard length, depth 4. Eye 4 in head, 1.66 in snout, 2 in interorbital, which is contained twice in head. Snout equals postorbital part of head. Least depth of caudal peduncle equal to its length, 1.4 in head.

Dorsal origin nearer snout tip than caudal base by a distance equal to snout plus eye. Origin of pelvics under sixth dorsal ray. Pectorals do not reach pelvic origin by 6 scales. Pelvics do not reach anal fin origin by 2 scales. Anus situated 3 scales anterior to anal fin origin, well between the tips of the appressed pelvics. Adipose fin originating above base of last anal ray. Dorsal fin margin falcate when fin is widely spread, the first soft ray elongated, exceeding the head by a snout length. Caudal deeply forked, the lobes acutely pointed.

Mouth decidedly inferior, snout rather pointed. The enlarged posterior parts of the mandibular rami each bear three heavy truncated incisors, their tips curving slightly outward. The premaxillaries each bear four teeth, extremely narrow at the bases and greatly widened at the distal ends, the margins being crenulated. These 8 teeth thus form a plane, continuous,

¹The vertical series of scales is counted from dorsal origin to pelvic origin.

finely crenulated cutting edge straight across the premaxillaries. Two smaller but similar teeth continue the series on the upper end of each maxillary.

The side, front, and inferior surfaces of the snout, as well as the region between the nostrils, are thickly beset with small prickly tubercles, apparently similar to the nuptial tubercles of male Cyprinoids. So far as I am aware such structures have not hitherto been noticed in the Characins.

A series of 13 or 14 dark vertical bars with equal interspaces along the sides, a number of them continued faintly over the back. Snout and dorsum brownish, venter lighter. Fins without definite markings.

There is but a single example. It is comparable in pattern only with *P. gestri* and *P. caliensis*, which differ sufficiently otherwise.

Named for Brother Hermano Apolinar Maria, Director of the Museum of the Instituto de La Salle, Bogotá.

CHARACIDÆ.

Astyanax integer, sp. n.

Diagnosis.—An *Astyanax* with predorsal region completely and regularly scaled, lateral line about 50, anal 30, the central caudal rays black, a well defined humeral blotch, and a wide dark lateral band from behind humeral spot to caudal.

Holotype.—No. 23726 Stanford University, 91 mm. standard length, 115 mm. total; Guaicaramo, Rio Guavio, Colombia; January, 1928.

Description.—Dorsal 11. Anal 30. Scales 10–50–7. Head 4 in standard length, depth 2.8. Eye equal to snout, 3.5 in head, 1.33 in interorbital.

Profile to tip of occipital process concave, thence evenly rounded to dorsal fin. Preventral area normally scaled, not compressed. Predorsal with a regular¹ series of 13 scales.

Interorbital smooth, convex. Occipital process long, 3.6 in the distance from its base to the dorsal, bordered by 4 scales. Frontal fontanel narrow, triangular. Maxillary reaches beneath anterior border of pupil. Lower jaw strong, equal to upper. Five teeth in inner series of each premaxillary, their outer surfaces concave, inner convex, the second, third, and fourth teeth seven-pointed, the last very small. Four teeth in the outer row of each premaxillary, the first set slightly forward. Maxillaries each with a single tooth at upper extremity, set next to the small end one of the inner premaxillary series. Dentaries each with four strong graduated teeth; a small fifth tooth is in line immediately behind and the tooth series then swings inward and back with a few very small teeth.

Gill-rakers 11+14, all of them rather long.

Origin of dorsal fin an orbit diameter nearer to snout tip than to caudal base. Height of dorsal 3.5 in standard length. Adipose fin well developed; caudal lobes pointed. Origin of anal equidistant from caudal base and origin of pectoral, slightly behind vertical of end of dorsal base. Pectorals reach pelvic fin origin; pelvics just fall short of reaching anal fin origin.

One or two interpolated series of scales low in the region over anal fin.

¹In all but one scale.

Front of anal with a sheath of one row of scales. Lateral line slightly decurved.

A rounded humeral blotch almost as large as eye above second to fifth scales of lateral line; a faint vertical elongation above and below. Following this is a light space of three scales and then a dark band down side. Above the anal fin this is darkest and is as wide as the eye; over the end of the anal it narrows somewhat and then again widens at caudal base. The band is continued narrowly out to the tips of the central caudal rays.

This species would appear to be close to some forms of *A. abramis*, but the well scaled predorsal area and the wide dark band remove it definitely from that species. Eigenmann (1922, p. 235) records *A. abramis* from Caño Carniceria, but with the characters he gives it seems certain that he did not have *A. integer*.

Hemibrycon metæ, sp. n.

Diagnosis.—Allied to *H. dentatus* (Eigenmann) and *H. decurrens* (Eigenmann) in the sagging lateral line, differing in the smaller eye, shorter head, and projecting lower jaw, and variously from one or the other in anal fin position, depth of peduncle, and number of scales.

Holotype.—No. 23727 Stanford University, 80 mm. standard length, 99 mm. total; Guaicaramo, Rio Guavio, Colombia; January, 1928.

Description.—Dorsal $9\frac{1}{2}$.¹ Anal 29. Scales 8–42–5 $\frac{1}{2}$. Head 4.66 in standard length, depth 3. Eye 3.33 in head, 1.25 in interorbital. Least depth of caudal peduncle equal to its length, 1.66 in head.

Preventral area rather narrow, normally scaled. Occipital process short, bordered by 3 scales. Interorbital very convex in cross section. Predorsal with 13 scales not in wholly regular order.

Snout rather blunt, lower jaw rather prognathous. Great suborbital covering entire cheek except for a very small area at upper posterior corner. Maxillary extending under first third of pupil, not quite reaching great suborbital. Five teeth in outer row on each premaxillary, the first and last set forward; four in inner row. Six teeth on each maxillary, the last remote from the others. Dentary with five large teeth on each side, the last two grading down to the row of small teeth behind.

Gill-rakers 9+11.

Origin of dorsal fin a shade nearer to snout tip than to caudal base, the margin nearly straight when fin is spread, the longest ray extending a scale-length beyond the penultimate when fin is folded. Pelvic fins reach anus but not anal fin. Anal origin under last third of dorsal base.

Lateral line decurved, a straight line from its anterior to its posterior end passing through the middle of the second row of scales above it at a point above the middle of the appressed pelvic fins. Anal sheath of one scale row. Interpolated series begin over anal fin. Pectorals reaching down to base of pelvics (absolute measurement) or slightly beyond (horizontal measurement). Caudal with a very large basal scale on each lobe, this extending out a considerable distance.

¹The last ray, split to the base, is counted as $1\frac{1}{2}$.

A very diffuse dark lateral band, strongest on peduncle, and a faint humeral blotch. Middle caudal rays black.

This form is undoubtedly the one from Villavicencio mentioned by Eigenmann (1927a, p. 414, footnote 2) under *H. dentatus*. In the final analysis, *dentatus*, *decurrens*, and *metæ* will possibly be found to be only subspecifically separable, but at the present state of our knowledge all we can do is to give them binomial recognition. *Metæ* resembles *dentatus* in anal fin position and in interpolated scales, and *decurrens* in depth of body, depth of peduncle and scale count. From both it would appear to differ in the projecting lower jaw, this being distinct in my only specimen, and in the shorter head and eye.

Charax metæ Eigenmann.

Two specimens, 45 and 72 mm. standard length, from Guaicaramo.

These differ from the types in the presence of pinnate black markings along the lateral line. *C. metæ* is very close to *pauciradiatus*¹ and not far from the *Anacyrtus sanguineus* of Cope.²

PIMELODIDÆ.

Rhamdia quelen (Quoy and Gaimard).

Two specimens 77 and 115 mm. standard length, from Guaicaramo.

Dorsal I, 6. Anal 10, counting rudiments. Jaws subequal. Teeth of upper jaw in a band which is not wider at ends than at center. Maxillary barbels reaching origin of adipose. Fontanel not extending behind eye. Dorsal spine smooth. No lateral band.

This is the first record for the Meta.

PYGIDIIDÆ.

Pygidium kneri (Steindachner).

One specimen, 104 mm. standard length, from Guaicaramo.

LORICARIIDÆ.

Chætostomus anomalus Regan.

One specimen, 80 mm. standard length, from Guaicaramo.

Adipose well developed. Snout faintly spotted with small round light dots. Eigenmann (1922, p. 226, footnote) has named a new form, *C. dorsalis*, with no description. Only his reference to Regan's figure places the fish. Undoubtedly the name was meant to apply to Regan's specimens without the adipose, but I do not believe that the presence or absence of the adipose in this group is of specific value.

¹See Garman, *Bull. Essex Inst.*, 1890, xxii, p. 11.

²*Proc. Acad. Nat. Sci. Philadelphia*, 1872, p. 266, pl. 9, fig. 1.

Farlowella acus (Kner).

Two specimens, 113 and 135 mm. standard length, from Guaicaramo.
The larger is a male with broad snout covered with fine prickles, the smaller a female with more slender smooth snout.

CICHLIDÆ.

Crenicichla geayi Pellegrin.

One specimen, 77 mm. standard length, from Guaicaramo.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONTHE STATUS OF THE SOUTHERN CALIFORNIA TOAD,
BUFO CALIFORNICUS (CAMP).

BY GEORGE S. MYERS.

In the interest of the Natural History Museum of Stanford University, Mr. Gregory M. Kranzthor and the writer journeyed through the Southwestern States as far as the Davis Mountains in Texas during April and May, 1929. Our objects were chiefly herpetological, though fishes were collected where opportunity offered. Weather conditions were adverse most of the trip but we succeeded in bringing back some rarities, including two *Elaphe bairdi*. Early rains in Texas permitted observations on several amphibians which otherwise would not have been seen until June or July. This, coupled with fortunate circumstances in San Diego County, California, on our trip home, enabled us to make comparisons between the Desert Toad, *Bufo cognatus* Say, and its supposed close relative in Southern California, *B. cognatus californicus* Camp.

Our observations confirm a conclusion reached by the writer long ago, that *californicus* is a distinct species not especially closely related to *cognatus*. The data on which this conclusion is based are as follows:

1. There is but a single large palmar tubercle present in *cognatus*, while in *californicus*, in addition to the large tubercle, a second smaller tubercle is invariably present at the base of the inner finger.
2. There is an apparently constant difference in the structure of the outer metatarsal tubercle in the two toads. In *cognatus* there is a flat tubercle with a free cutting edge. In *californicus* the tubercle is reduced to a small horny point; no cutting edge is present.
3. The under surface of *californicus* is much less coarsely granulated than that of *cognatus*. Even young specimens of *cognatus* show a proportionally coarser areolation than adult *californicus*.

4. *The two forms differ in the cranial crests.* The crests of *californicus* are less distinct than those of *cognatus*, and the nasal boss, so conspicuous in the latter, is greatly reduced.

5. *The foot of californicus is comparatively longer than that of cognatus.* The length of the foot, from the inner side of the tibio-tarsal joint to the tip of the longest toe, enters the length from snout tip to vent slightly less than two times in *cognatus* and about one and two-thirds times in *californicus*.

6. *Full grown adults of the two toads differ greatly in size.* *B. cognatus* is constantly a much larger form than *californicus*, which does not equal half the bulk of the larger animal. A female *cognatus* of average size from Pecos, Texas, measures 85 mm. from snout tip to vent, while an exceptionally large female *californicus* from Rincon, San Diego County, reaches but 58 mm.

7. *The two forms are distinctly different in color.* The large light-edged green spots of *cognatus* are not present in *californicus*, but instead there are smaller spots distributed irregularly over the back, these being blackish in color. A prominent and very characteristic feature of the coloration of *californicus* is the presence of indefinite but conspicuous whitish areas disposed as follows: A heavy bar across the front of each eyelid meeting at the midline of the head to form an obtuse V, a patch on the front third of each parotoid, a small median spot between the middles of the parotoids, and a pair of elongate spots, diverging posteriorly, on either side of the midline at the middle of the back. The V on the head is seen in *cognatus*, but less whitish in color, and although apparent homologues of some of the other spots may be discerned in this form, these never have the same peculiar indefinite boundaries observed in *californicus*. Further, there is a characteristic mottling of light and dark along the sides which is not seen in *cognatus*. In general appearance it is always possible to distinguish the two toads at a glance, even though occasional specimens of *californicus* have the dorsal dark spots large and arranged much as in *cognatus*.¹

8. *The vocal sacs of the males of the two species differ sharply in form.* The vocal sac of *cognatus* arises from the base of the throat and when inflated is kidney-shaped, extending far forward up in front of the head. (See Dickerson, *Frog Book*, pl. XXXIV, fig. 100.) The vocal sac of *californicus* originates in the normal position and when inflated is of the plain rounded form seen in *B. fowleri*. (Dickerson, *tom. cit.*, pl. XXIX, fig. 83.)

9. *The calls of the two species are vastly different.* The call of *cognatus* is a trilled rattle, with much of the timbre of *Acris* in it. The call of

¹The comparative material of *cognatus* used, although from El Paso County, Texas, appears to agree well with the population of *cognatus* in the Imperial Valley, California. Along the Pecos River in Texas, however, *cognatus* is a very different creature, the large spots breaking up and the crests becoming reduced. More material may show much of taxonomic interest in the *cognatus* population of Texas.

californicus is a sweet trill reminding one of *B. americanus* but somewhat lower and less prolonged.

10. Finally, the habitats of the two forms are trenchantly different, their breeding sites are unlike, and their ranges do not appear to meet. *B. cognatus* is strictly a desert animal throughout its range, living in burrows out in the desert and congregating for breeding at temporary (or in some cases perennial) pools at the advent of the summer rains. It appears to be generally confined to the Lower Sonoran Zone. In San Diego County, at least, *californicus* is met with only in the hills, which are comparatively moist, and most of its range is included in the Upper Sonoran. Here it is confined strictly to the streams in the washes (arroyos) and it is here that it breeds, considerably after the bulk of the winter and spring rains. Temperature appears to be more of a deciding factor than the rains, in this case. In range the two species appear to be separated by a neutral strip of variable width, although when more is known of the western boundary of the range of *cognatus*, this may not be very wide. So far as now known, *cognatus* is limited on the west by the extent of the Salton Sea and its associated waterways, the records being Brawley, Mecca, and Coachella. Our finding of *Bufo woodhousii* at El Centro and at Harper Well within ten miles of the San Diego County line, however, indicates that *cognatus* as well as *woodhousii* may be found at isolated stations right up to the base of the mountains. One has to climb up out of the desert to the comparatively moist heights about Jacumba and Julian (which here reach the Transition Zone) before localities suited to *californicus* are found.

The above points, the most important of which appear to be numbers 1, 2, and 8, show without a shadow of doubt that we are dealing with two forms which can in no way be considered as subspecies. The Southern California Toad must then be known as:

***Bufo californicus* (Camp).**

Bufo cognatus californicus Camp, 1915 (Apr. 2), Univ. California Publ. Zool., XII, No. 12, p. 331 (Orig. description, type locality Santa Paula, 800 ft. alt., Ventura Co., Calif.); Grinnell and Camp, 1917 (July 11), Univ. California Publ. Zool., XVII, No. 10, p. 141, fig. 4 (Range and distrib. map); Stejneger and Barbour, 1917, Check-list North American Amphib. Rept., p. 28 (Range); Hall and Grinnell, 1919 (June 16), Proc. California Acad. Sci., Ser. 4, IX, No. 2, p. 47 (Zonal range); Pratt, 1923, Man. Land Freshw. Vert. Anim. United States, p. 173; Stejneger and Barbour, 1923, Check-list North American Amphib. Rept., p. 25 (Range); Storer, 1925 (June 12), Univ. California Publ. Zool., XXVII, p. 192 (Re-description, history, range, etc.); Klauber, 1928 (July 1), Bull. No. 4, Zool. Soc. San Diego, p. 2 (Range in San Diego Co.); Slevin, 1928 (Sept. 15), Occ. Pap. California Acad. Sci., XVI, p. 107, pl. 16, fig. 2-3 (Description, range, photographs); Klauber, 1929 (Apr. 30), Copeia, No. 170, p. 15 (Range extension).

This distinctive little toad is known from a specimen taken in Tujunga Wash, near Sunland, Los Angeles County, by Dr. Joseph Grinnell, in 1904, another collected by Dr. C. L. Camp on a lawn in Santa Paula, Ventura County, in 1912, and a considerable series obtained in the last few years far to the south, in San Diego County, by Mr. L. M. Klauber and his collectors. The San Diego County records delineate in a general way its distribution in the south and indicate that it may extend some distance further, into Baja California. What its distribution to the north may be still remains almost unknown. There is a gap of ninety miles between the San Diego County records and the Sunland one, and again of forty-five between the latter and Santa Paula. It seems rather strange that other specimens have not come to light to the northward, especially in view of the considerable collecting that has been done about Los Angeles. *Californicus* is a secretive animal, however, and probably never wanders far from the washes in which it lives. Doubtless it occurs somewhat to the north of Santa Paula, following up the stream-beds, and it may reach Santa Barbara. The country between Los Angeles and Monterey is still little known herpetologically.

Bufo californicus does not appear to break its hibernation until about the middle of May. It is in fact rather cold in the mountains of San Diego County until late in spring. We searched unsuccessfully for it in early April and Mr. Klauber tells me that he has not taken it so early in the season. On our return trip, on the night of May 31, 1929, I hunted along the creek near Descanso. It was cold, too cold, I thought, for toads. A number of *Hyla regilla* and a few *H. arenicolor* were calling from various places along the stream. At length a single toad call was heard, a high musical trill, entirely unlike that of *halophilus*. I carefully stalked the animal, but when I approached within what seemed to be twenty-five or thirty feet the call ceased and I was able neither to locate the singer nor induce it to call again. No others were heard and after considerable search we went on.

In San Diego next day we visited Mr. Klauber and he had a number of live adults of *californicus* obtained at Rincon, San Diego County, a few days previously. He says they are easily caught on sandy or gravelly stretches in the bottoms of washes along the streams. If one stands still in the dark in early evening in such localities, particularly in the vicinity of growths of oak, the toads finally begin to move about and can then be found by quick use of the flashlight in the direction of the rustle of the dead leaves.

We are greatly indebted to Mr. Klauber for the gift of six of these fine Rincon specimens. The present paper is based on a study of these individuals, and it was one of them, calling in captivity, that finally enabled me to connect up the call heard at Descanso with this species. The toad called several times in the same clear trill. Mr. Klauber tells me he has often heard these calls in vicinities where *californicus* has been taken but has never been able to refer it definitely to this form.

The "protesting" note of the male *californicus*, given when held without support for its feet, or when walked upon by another toad, is of the same

musical quality as the breeding trill, very different from the coarse note uttered by *cognatus* under the same circumstances.

The end of May and the first part of June appear to be the breeding season of *californicus*. One of the females spawned not long after I had brought it to the University, but the eggs, though fertile, did not complete their development and were lost.

This little toad has a peculiar resemblance to *Scaphiopus couchii*, on account both of size and shape and of the light marks on the back and the mottlings on the sides. It is easily distinguished from half-grown *Bufo canagicus halophilus*, the only other *Bufo* found in its range, by the absence of a conspicuous light median dorsal streak and the presence of cranial crests. Its numerous differences from *cognatus* are sufficiently indicated above. But even though the two species seem to have diverged to a considerable degree, there is abundant evidence that *cognatus* is the closest ally of *californicus*. The cranial crests, nasal boss, short legs, and color pattern all show this relationship. Occasional individuals of *californicus* show traces of the large blotches of *cognatus* and the patterns on the head and back are often very similar. The pattern of *californicus* appears to be derived from one like that of *cognatus* by a breaking up of the large spots and a general obliterating of the sharp borders of the colors in the latter type. The light areas may be partly a new development but the one across the eyelids is seen in the same place but with a definite edging in *cognatus*. Those on the back may be derived from an enlargement of the light edges of the dorsal spots of *cognatus*.

The following life colors were unfortunately taken without Ridgway's Nomenclator in hand. Iris silvery or slightly yellowish gray speckled with black. Upper surfaces various shades of dull brown with a greenish tinge. All warts of back tipped brownish. Blotches black. Hind border of tarsus and rump largely black, the warts whitish. Under surfaces yellowish white, unmarked. Enlarged warts behind angle of mouth largely whitish.

The type and paratype were described by Camp and by Storer as lacking the external metatarsal tubercle. My material possesses this structure, as did Slevin's. Slevin, in his key, has however substituted the inner for the outer tubercle, apparently through a slip. Further, it will be noted that the localities of the type and paratype are placed in the Lower Sonoran, whereas most or all of the San Diego County records are in the Upper Sonoran. It is evident that an amphibian, depending to so great a degree on the presence of water, and in this case restricted to a peculiar habitat, the washes, will not have the same limiting factors in its distribution as one might expect to find in a bird, mammal, or plant. In fact it happens in a large number of cases that attempts to explain amphibian distribution in terms of the ordinarily recognized zonal areas fails in a greater or lesser degree. For even more obvious reasons the fresh-water fishes of, for example, the Western States agree still less well. It is my opinion however that *Bufo californicus*, when more of its distribution is known, will be found to occur largely in the Upper Sonoran.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW FORMS OF LAUGHING THRUSHES FROM
YUNNAN.

BY J. H. RILEY¹

Dr. Joseph F. Rock for the past two years has been exploring the high mountains in northwest Yunnan and southwest Szechwan in the interests of the National Geographic Society. During the course of his explorations he formed a large collection of birds, which has been generously presented to the U. S. National Museum by the Society. In identifying this material the two following races appear to be unnamed and are described below.

I am indebted to the authorities of the Museum of Comparative Zoology for the loan of material used in the preparation of this article.

Garrulax albogularis eous, subsp. nov.

Type—Adult female, U. S. National Museum, No. 314184, Fuchuanshan, 9,800 feet, Mekong-Salwin Divide, Yunnan, September, 1929. Collected by Joseph F. Rock (original No. 1667).

Similar to *Garrulax albogularis albogularis*, but much lighter above, the forehead more strongly and extensively tinged with tawny; the cinnamon-buff of the breast lighter, the chest band a lighter brownish olive. Wing, 136; tail, 136; culmen, 22; tarsus, 43; middle toe, 24 mm.

Remarks—Dr. Rock secured a series of four males and two females at the type locality. This series is quite uniform and differs as described from an unsexed specimen from Nepal. An unsexed bird from Kumaon, India, which I take to represent *Garrulax albogularis whistleri*, comes nearer to the Yunnan form than that from Nepal, though further away geographically; it has the forehead less extensively tawny, the black of the lores more restricted, and the breast a deeper cinnamon-buff.

A series of four adults from Mount Omei, Szechwan, taken by David C. Graham, strange to say, is very close to the Nepal race; much closer than it is to the Yunnan form here described. This I can not understand

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very well, unless the Szechwan birds came westward through Tibet and remained practically unchanged, while the Yunnan bird came south and encountered a different environment.

Dryonastes berthemyi ricinus, subsp. nov.

Type—Adult male, U. S. National Museum, No. 314,188, Nda much'o, 14,000 feet, Yunnan, China, October, 1929. Collected by Joseph F. Rock (original no. 1486).

Similar to *Dryonastes berthemyi* of the mountains of Fokien, but lighter brown above and on the foreneck and jugulum; breast and belly a much lighter gray. Wing, 126; tail, 132; culmen, 20; tarsus, 42; middle-toe, 24.5 mm.

Remarks—The type of *Dryonastes berthemyi* came from the mountains of northwest Fokien, probably Kuantun, and the form has never been taken away from there. It is rather surprising to find a closely related form in the high mountains of north west Yunnan, over a thousand miles from the type locality of the species. Nda much'o is south of Lütien on the Yangtze-Mekong divide. Doctor Rock secured two females and one male at the type locality. The U. S. National Museum contains an adult female of *Dryonastes berthemyi* from the type locality and the Museum of Comparative Zoology has loaned me a pair from near the same place; the three specimens are quite uniform. The three specimens from north-west Yunnan are also quite uniform and differ from the Fokien bird as described. The three specimens from Yunnan measure: Wing, 120-128 (124); tail, 125-132 (128); culmen, 20-22 (20.7). Two females and one male from Fokien measure: Wing, 116-118 (116.8); tail, 122-126 (123.5); culmen, 22.5-23 (22.7).

La Touche (Handb. Birds E. China, pt. 1, 1925, p. 57) makes *berthemyi* a race of *poecilorhynchus* of Formosa, but I do not think he is right in doing so. They have both been derived from the same stock, but now are so distinct that it is misleading to treat them as forms of the same species.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

FERN MISCELLANY.¹

BY WILLIAM R. MAXON.

In the course of studying tropical American ferns received for identification at the National Herbarium, and reidentifying and arranging material in the herbarium itself, there continually come up a good many points which, though not important enough to justify separate publication, may prove useful collectively to other students of the group. It is intended to bring these together in a series of short papers, of which this is the first. They will consist of noteworthy extensions of range, occasional descriptions of new species, and miscellaneous systematic notes, such as descriptive data, changes in synonymy, and the publication of new or transferred specific names.

CYATHEACEAE

Cyathea cuspidata Kunze, *Linnaea* 9: 101. 1834.

Described from specimens collected in the province of Maynas, Peru, in February, 1831, by Poeppig (no. 2286), and usually ascribed only to Peru. The following specimens are at hand:

PANAMA: "River banks of the Huigador, last Atlantic river on the Divide," Darién, 1858, *Schott* 34.

BOLIVIA: Polo-Polo, near Coroico, North Yungas, alt. 1,100 meters, *Buchtien* 3602. Antahuacana, alt. 750 meters, *Buchtien* 2196 (trunk 6 meters high). Tumupasa, alt. 540 meters, *Williams* 1335. Without locality, *Kelly*.

PERU: Fragments of type collection, *Poeppig* 2286.

Cyathea caribaea Jenman, *Ferns Brit. W. Ind. Guian.* 57. 1898.

Cyathea purdiaei Jenman, *Ferns Brit. W. Ind. Guian.* 58. 1898.

Cyathea caribaea and *C. purdiaei* were described as new by Jenman at the same time, the former from St. Vincent, the latter from Trinidad as "gathered by Purdie, Sept. 6th, 1862, on the heights of Aripo, and not apparently

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by any one since." In reporting recent Trinidad specimens as *C. caribaea* the writer was asked by Mr. W. E. Broadway whether or not these might be *C. purdiaei*, instead. Jenman's type specimen of *C. purdiaei* has since been forwarded on loan from the New York Botanical Garden, and a comparison of this with typical material of *C. caribaea* from St. Vincent shows them to be identical, even to the smallest detail. The following specimens are at hand:

ST. VINCENT: Without definite locality, *H. H. & G. W. Smith* 962 (probably the type collection of *C. caribaea*).

TRINIDAD: Heights of Aripo, Sept. 6, 1862, Purdie (type of *C. purdiaei*). Mount Tocuche, in forest, April 3-5, 1920, *Britton, Hazen & Mendelson* 1360. Morne Bleu, in forest, March 13, 1921, *Britton, Freeman & Bailey* 2287. Heights of Aripo, Jan. 10-26, 1922, *Broadway* 9969. Without special locality or date, *Trinidad Bot. Gardens Herb.* 15.

Cyathea oyapoka Jenman, *Ferns Brit. W. Ind. Guian.* 58. 1898.

Described from a specimen collected by Leprieur "in sylvis humidis ad torrentes, Guyana centralis, Oyapok superior, Junio 1833." A portion of Jenman's type material, bearing Leprieur's number 267, was received for study recently from the Botanic Gardens, Georgetown, British Guiana, through the kindness of the Director. Agreeing closely with this are four ample specimens in the U. S. National Herbarium:

FRENCH GUIANA: The type collection, *Leprieur* 267. In sylvis humidis ad torrentes, Oyapok superior, Juin, 1833, *Leprieur* 194 (137). In sylvis paludosis ad basin montium, 1847, *Leprieur* 197. Without locality data, *Leprieur* 190.

Fragments of *Leprieur* 224, received from Rosenstock as a new species related to *C. cuspidata* Kunze, are the same also.

In general appearance *C. oyapoka* is not very unlike *C. caribaea*, with which (as *C. purdiaei*) Jenman confused it; but its real alliance is with neither *C. caribaea* nor *C. cuspidata*, these being characterized by globose indusia, which rupture irregularly. In *C. oyapoka* the indusia are deeply cup-shaped, with even edges, placing it in another section of the genus.

Hemitelia escuquensis Karst. *Fl. Columb.* 2: 181. *pl.* 196. 1869.

A curious species, founded on material from western Venezuela (vicinity of Maracaibo Harbor), and known additionally heretofore only from Porto Rico, where it is rare. Much interest attaches to its recent discovery in Haiti, the specimens collected from thickets along the Marmelade trail, near Plaisance, Dépt. du Nord, at 400 meters elevation, Jan. 27, 1926, by Dr. W. L. Abbott (nos. 9308, 9309).

SCHIZAEACEAE.

Anemia karwinskyana (Presl) Prantl.

This species was founded on specimens collected by Karwinsky at Cristo, Mexico, in 1827. It is strikingly distinct, and so rare in herbaria that much interest attaches to two additional collections, both Mexican:

Real de Guadelupe, Michoacán or Guerrero, Sept. 15, 1898, *Langlassé* 353; vicinity of Tepenixtlahuaca, Distrito de Inquila, Oaxaca, alt. 650 meters, Dec. 1, 1921, *Conzatti* 4374. The strongly catadromous pinnules and segments at once set this and *A. rosei* Maxon, also of Mexico, apart from related North American species.

GLEICHENIACEAE.

Dicranopteris lehmannii (Hieron.) Maxon.

Gleichenia lehmannii Hieron. Bot. Jahrb. Engler **34**: 562. 1905.

A sharply characterized species, well represented by two specimens of the type collection, these recently received from Kew: Western cordillera of Popayán, Colombia, alt. 1,300–1,800 meters, *Lehmann* 6963.

POLYPODIACEAE.

Polypodium antillense Maxon, nom. nov.

Goniophlebium acuminatum Fée, Mém. Foug. **11**: 68. pl. 19, f. 1. 1866. Not *Polypodium acuminatum* Houtt. 1786, Roxb. 1825, nor Sod. 1893.

This species, described originally from Guadeloupe, is known to the writer from Martinique (*Duss* 1652, 4735), Jamaica (*Hart* 42; *Maxon* 1022, 1918), Haiti (*Ekman* 9659), and the Dominican Republic (*Fuertes* 1770). It is allied to the continental *P. surucuchense* Hook.; but that species, as represented by specimens from Costa Rica (*Alfaro* 122; *Standley* 34919a, 35234, 35440), Colombia (*Ariste Joseph A* 345), Ecuador (*Jameson*; *Mille* 35), and Peru (*Macbride* 3405, 3635), is amply distinct in many characters, notably in its broad, short, patent areoles, its prominent, whitish-translucent venation, and its huge sori. Fée's species name would be invalid under *Polypodium*.

Polypodium fucoides Christ, Bull. Herb. Boiss. II. **5**: 2. 1905.

Polypodium crassulum Maxon, Contr. U. S. Nat. Herb. **17**: 598. 1916.

In describing the present plant as a new species, *P. crassulum*, the writer failed to identify it with Christ's earlier description of *P. fucoides*, founded upon a single incomplete specimen collected in Costa Rica by Werckle (no. 172), without definite locality data. An examination of Christ's type specimen, kindly lent from Paris, shows however that the two are identical. This species turns out to be abundant in Costa Rica at elevations of 1,900 to 2,600 meters, the following additional specimens being now at hand: *Lankester* 602, 716; *M. Valerio* A17, A64; *Maxon & Harvey* 8199, 8225, 8414, 8466; *Standley* 38086, 38118; *Standley & J. Valerio* 48160, 48199, 48222, 50448, 50489, 50641, 50667, 50687, 52182, 52279.

Coniogramme americana Maxon.

Founded on *Palmer* 1416 from Ymala and *Palmer* 1572 from Lodiego, both in the state of Sinaloa, Mexico. Two additional specimens are at hand, one collected from moist shady arroyo banks, Rancho del Limoncito, District of San Ignacio, Sinaloa, June 18, 1918, by Antonio E. Salazar (no. 403); the other a juvenile specimen (without number) collected at Acaponeta, Tepic, July, 1897, by J. N. Rose.

Hypolepis pulcherrima Underw. & Maxon, nom. nov.

Hypolepis purdieana Jenman, Bull. Bot. Dept. Jamaica 36: 10. 1892; not Hook. Sp. Fil. 2: 69. pl. 91, B. 1852.

The present manuscript name, up to now unpublished, was given twenty-five years ago by Dr. Underwood and the writer to the high mountain Jamaican plant taken up as *Hypolepis purdieana* Hook. by Jenman, who failed to distinguish it from the true species of that name, founded on a Colombian specimen. Hooker's type, recently examined on loan from Kew, is, as originally described and figured, small (the blade 25 cm. long, 8 cm. broad), barely bipinnate, with rachises and midribs copiously tawny hirsute-villous, and sori definitely protected by recurved indusiform lobules, the margins of which are considerably modified, being thin, pale and distinctly toothed. In all these particulars it departs widely from the large decompound Greater Antilles plant.

Hypolepis pulcherrima is abundant at 1,800 to 2,200 meters altitude in Jamaica, especially on Blue Mountain Peak: *Maxon* 1370, 1458, 9912, 9935; *Hart* 159; *Skutch* 111; *Watt* 6; *Bot. Dept. Jam.* 100. It has been discovered recently also in Haiti: Massif de la Hotte, alt. 2,375 meters, *Ekman* 10636.

Hypolepis ekmani Maxon, sp. nov.

Plant of coarse aspect, the fronds apparently suberect and about 2 meters high, the primary rachis stout (5 mm. thick), dark ochraceous, unarmed, as also the deeply sulcate castaneous stipe. Blades presumably 1.5 meters long, 1-1.3 meters broad, tripinnate-pinnatifid; primary pinnae very oblique, short-petiolate (2-3 cm.), elongate-triangular, 40-65 cm. long, 20-25 cm. broad, the bright ochraceous secondary rachis muricate, scarcely aculeolate; secondary pinnae 10-12 pairs below the acuminate apex, distant, oblique-spreading, the distal ones mostly equaling the proximal, only the basal pair subopposite, all narrowly oblong-acuminate, the larger ones 10-15 cm. long, 3-5 cm. broad, the tertiary rachis straight, yellowish, alate toward apex, scantily septate-villosulous; pinnules about 15 pairs, spreading, distant, mostly alternate, oblong-acutish, 1.5-2.5 cm. long, 6-10 mm. broad, deeply pinnatifid, the segments (6 or 7 pairs) close, slightly oblique, short-oblong, rounded-obtuse, lightly crenate; veins about 4 pairs per segment, pinnately arranged, simple, or the sterile ones often once-forked; sori 2 or 3 per segment, very large, round, widely surpassing the elongate receptacle; indusia borne at extreme sinus, small, submembranous, yellowish-translucent, shallowly concave, bearing a few minute, septate, easily deciduous hairs, spreading, never fully embracing the sporangia. Leaf tissue yellowish green, soft-herbaceous, bearing a few short appressed deciduous septate hairs above, scantily and minutely glandular-puberulous beneath.

Type in the U. S. National Herbarium, no. 1,302,995, collected at the summit of Morne Formon, Massif de la Hotte, Haiti, altitude 2,200 meters, January 1, 1927, by E. L. Ekman (no. H. 7503). The description is drawn partly also from three pinnae of the same number on loan from Copenhagen and an additional imperfect specimen in the National Herbarium, the latter indicating larger measurements than those here stated.

The present species is well marked, but at the same time is difficult of comparison because of confusion within the genus. It is most nearly related, apparently, to an undescribed species from the higher Blue Mountains of Jamaica.

Notholaena sinuata (Swartz) Kaulf.

A widely distributed and ubiquitous continental species now to be reported from Haiti: Crevices of exposed rocks, foothills near St. Michel de l'Atalaye, Dépt. du Nord, alt. about 350 meters, Dec. 7, 1925, *Leonard* 7831. Apparently new to the West Indian flora. The material is thoroughly characteristic.

Athyrium sciatraphis (Donn. Sm.) Maxon.

Gymnogramme sciatraphis Donn. Sm. Bot. Gaz. **19**: 266. pl. 26. 1894.

Founded on very complete material collected in the lowlands of eastern Costa Rica (Jiménez, Llanos de Santa Clara, alt. 195 meters, April, 1894, *J. D. Smith* 5084). Agreeing closely with the type are other specimens from Costa Rica, as follows: Tuis, alt. 650 meters, *Tonduz & Pittier* 11319; Peralta, alt. 450 meters, *Lankester* 896; without locality, *Werckle*. In all these a narrow, curved, persistent indusium is readily seen. The relationship is with *Athyrium ferulaceum* (Hook.) Christ, of the South American Andes.¹

Asplenium leucothrix Maxon, nom. nov.

Athyrium verapax Christ, Bull. Herb. Boiss. II. **6**: 292. 1906. Not *Asplenium verapax* Donn. Sm. Bot. Gaz. **13**: 77. pl. 2. 1888, which is *Diplazium verapax* (Donn. Sm.) Hieron., 1917.

The present species was founded on a plant collected at Cubilquitz, Alta Verapaz, Guatemala, altitude 350 meters, by von Türeckheim (no. 8818). A specimen of the original collection at hand proves that it is no *Athyrium*, but an *Asplenium*, with acicular, markedly clathrate scales, allied to *A. pumilum* Swartz. A new name is required as indicated above, the name *verapax* being preoccupied in *Asplenium*.

Asplenium standleyi Maxon, sp. nov.

Rhizome arcuate-ascending, 2-4 cm. long, 4-7 mm. thick; apex exposed, densely paleaceous, the scales oblong-lanceolate, 3-4 mm. long, 1 mm. broad, reddish brown, the middle cells rather large, polyhedral, with moderately sclerotic dark partition walls, the outer cells small, linear, with paler and thinner partition walls, the margins bearing a few long, lax, slender, few-celled, mainly retrorse teeth. Fronds 4-7, laxly cespitose, ascending, 30-40 cm. long, the stipes 2-5 cm. long, dull grayish brown (like the rachis), faintly alate above, glabrous; blades simply pinnate, mostly 25-35 cm. long, 4-6 cm. broad near middle, linear-lanceolate, attenuate-caudate at apex (the linear-attenuate tip 2-4 cm. long, pinnatifid-serrate), evenly attenuate toward base, the pinnae distant (2-2.5 cm. apart), retrorse, the

¹Christ, Bull. Herb. Boiss. II. **4**: 968. 1904.

lowest ones greatly reduced (5 mm. or less), auriculiform; rachis narrowly greenish alate adaxially; pinnae about 30 pairs, mostly horizontal, alternate, characteristic middle ones inserted 9-12 mm. apart, 2.5-3.5 cm. long, 7-9 mm. broad at the strongly dimidiate base, narrowly trapeziform-oblong, evenly long-acuminate from middle; veins 10-13 pairs, the distal basal one with 5-7 ultimate veinlets, the margin here dentate; proximal veins and those of the apical region (both sides) mostly simple, oblique, the margins simply serrate; middle distal veins mostly once-forked, the deep marginal serrations bicrenate-dentate; sori numerous (7-11 pairs), short (1.5-2.5 mm. long), subequal, distant, medial, oblique, the firm whitish indusia partially obscured at maturity. Leaf tissue membranaceous, translucent, dull green, at first with a few scattered appressed minute glandlike hairs beneath.

Type in the U. S. National Herbarium, no. 1,150,764, collected on Sierra de Apaneca, in the region of Finca Colima, Dept. Ahuachapán, El Salvador, in deep forest, January 17-19, 1922, by Paul C. Standley (no. 20136). Two additional collections by Mr. Standley (nos. 19767 and 19779) from the vicinity of Ahuachapán, alt. 800-1,000 meters, are identical.

Allied to *A. miradorensis* Liebm., but at once distinguished by its subherbaceous texture, paler color, long-acuminate, narrower, and less deeply serrate pinnae, and more numerous veins, and especially by its even rows of distant and relatively very short sori.

Struthiopteris caudata (Baker) Maxon.

Lomaria caudata Baker in Hook. & Baker, Syn. Fil. 179. 1867.

Blechnum sprucei C. Chr. Ind. Fil. 160. 1905.

Founded on a specimen from Tunguragua, Ecuador, *Spruce* 5329. Agreeing closely with the type specimen, photographed at Kew, is the following collection from Costa Rica, which apparently represents an addition to the North American fern flora: Volcán de Barba, alt. 2,750 meters, July 29, 1926, *M. Valerio* 1.

Leptochilus liebmanni Maxon, nom. nov.

Acrostichum hastatum Liebm. Dansk. Vid. Selsk. Skrift. V. 1: 172.

1849. Not *A. hastatum* Thunb., 1784, which is *Cyclophorus hastatus* (Thunb.) C. Chr.

This species, of which a good specimen of the type material is at hand (Barranca de Jovo, Dept. Veracruz, alt. 450 meters, in moist shady situations, May 1841, *Liebmann* 2446), requires a new name, as above indicated. It is a remarkably distinct plant, in its numerous pendulous included veinlets not at all closely related to *L. alienus*, to which it has been referred. On the basis of numerous free veinlets its general alliance is rather with *L. cladorrhizans* (Spreng.) Maxon, which differs however in most other characters, especially in its far greater size, stalked basal pinnae, and long-attenuate, usually flagelliform radicate apex. In *L. liebmanni* both the sterile and fertile blades are obliquely pinnatifid merely, the segments only about 3 pairs below the ample hastate apex.

Dryopteris columbiana C. Chr.

Founded on *H. H. Smith* 998, from Santa Marta, Colombia, the actual type specimen being in the Bonaparte Herbarium. A complete specimen of this number in the U. S. National Herbarium is, however, *D. muzensis* Hieron., a species founded on *Stübel* 453, from Colombia, and represented also by *Pittier* 892 from Cauca, Colombia, and *Fendler* 181 from Colonia Tovar, Venezuela. Though resembling *D. muzensis* in a general way, *D. columbiana* is at once distinguished by its long-ciliate segments and the long rigid hairs of the veins above. Two pinnae of the actual type specimen were obligingly forwarded by Prince Roland Bonaparte. Additional specimens are: Cauca, Colombia, *Lehmann* 2968 (2 sheets); Chiriquí, Panama, *Maxon* 5202.

Dryopteris pusilla (Mett.) Kuntze.

This rare and peculiar Andean species is listed by Christensen only from Colombia (*Lindig* 92, the type collection; *Stübel* 413 in part, 427) and Peru (*Lechler* 2242, 2691), the specimens all being in the Berlin Museum. The range is greatly extended by the following specimens, all in the U. S. National Herbarium:

COLOMBIA: Santa Elena, Medellín, *Bro. Henri-Stanislas* 1693. Region of Bogotá, *Apollinaire & Arthur* 173.

VENEZUELA: Páramo de Aricagua, Mérida, alt. 2,700 meters, *Jahn* 1012.

COSTA RICA: Volcán de Barba, alt. 2,600–2,900 meters, *M. Valerio* 51, 107, 208.

Dryopteris warmingii C. Chr.

This species, known heretofore only from Brazil (Minas Geraes, *Warming*; São Paulo, *Regnell* III. 1449b), may now be reported from Bolivia, on a specimen collected at Rurrenabaque, altitude 300 meters, November 24, 1921, by O. E. White (no. 1801).

Dryopteris malacothrix Maxon, nom. nov.

Goniopteris asterothrix Fée, Gen. Fil. 253. 1850–52.

Dryopteris asterothrix C. Chr. Dansk. Vid. Selsk. Skrift. VII. Naturv.

Afd. 10²: 221. 1913. Not *D. asterothrix* Rosenst. 1909.

The present species, which on account of its copious soft-hairy covering is one of the most distinctive members of its group in the subgenus *Goniopteris*, was founded on *Linden* 1917, from Cuba, and is represented in the National Herbarium by ample material from Cuba, Jamaica, Haiti, Guatemala, Costa Rica, and Venezuela, which is uniform and has been well described by Christensen. The need of a new specific name is obvious.

Dryopteris skinneri (Hook.) Kuntze.

Aside from an Ecuador specimen (*Spruce* 5293) doubtfully referred here by Christensen, this species has hitherto been known only from the original material from "Guatemala," collected by G. U. Skinner and described

and figured by Hooker as *Aspidium skinneri*. A single detached frond from western Guatemala is now at hand. It was collected near Retalhuleu, March 25, 1921, by Rojas (no. A). Except for occasional forking of the veins it agrees with Hooker's figure.

Tectaria acutiloba (Hieron.) Maxon.

Aspidium acutilobum Hieron. Bot. Jahrb. Engler 34: 450. 1904.

There is at hand a specimen of the type collection: Banks of Río Timbiquí, Colombia, Lehmann 8932.

Tectaria sodiroi (Baker) Maxon.

Nephrodium sodiroi Baker, Journ. Bot. Brit. & For. 6: 164. 1877.

Aspidium sodiroi Hieron. Bot. Jahrb. Engler 34: 451. 1904.

Apparently a valid species, founded on Ecuador material. A specimen from Colombia (Lehmann 8926), so determined by Hieronymus, has recently been received from Kew.

Dennstaedtia arborescens (Willd.) Ekman, in litt.

Davallia arborescens Willd. Sp. Pl. 5: 470. 1810.

Willdenow's very brief description is based wholly on Plumier's plate 6, depicting a Hispaniola fern which seems not to have been again collected in that island until recently (Ekman 1682, 3112, 5446, 6770, 7529, 7633, 7825, all from the Republic of Haiti). Although the illustration is poor in certain respects, it almost certainly represents the species collected in such abundance by Dr. Ekman. The specific name *arborescens* is however most inappropriate, and its use is owing to Willdenow's having taken at face value certain data from Plumier regarding "arborescent" habit, i. e. a caudex 3 ft. high and 6 inches thick; these data of Plumier, taken in connection with his description of the pulpy interior of the caudex, point to some species of *Cyathea* presumably as a foreign element mixed in. Nevertheless this species name must be used.

Twenty-five years ago the writer, not then having Hispaniola specimens in hand, gave a manuscript name (still unpublished) to Jamaican specimens which prove to represent the same species. They are from the Blue Mountains at 1,800 to 2,100 meters elevation, consisting of several specimens in the Jenman Herbarium (collector not stated) and others collected by J. H. Hart and Miss Winifred J. Robinson. Under the name *Dicksonia adiantoides*, Jenman in his Synoptical List incorrectly described the root-stock as "stout," probably from reliance upon the Plumier's plate 6 and the Willdenovian name (*Davallia arborescens*), both of which he quotes in synonymy. Actually, however, the plant has a typical *Dennstaedtia* rhizome, wide-creeping, 8-10 mm. thick, and devoid of scales, as shown by Miss Robinson's excellent specimens.

The relationship of *Dennstaedtia arborescens* is with three or four South American and Central American species which it is hoped later to illustrate and discuss comparatively.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

FIFTEEN NEW SPECIES OF GRASSES, SIX FROM
AFRICA, NINE FROM CHINA.

BY A. S. HITCHCOCK.

Recently Dr. Carl Christensen, the Director of the Copenhagen Botanical Museum, sent to me for identification a collection of grasses made by Mr. O. Hagerup during the Danish Sudan expedition of 1927 to the French Sudan and Niger Territory.

Two collections from China have also been received, one from Mr. T. Tang, who collected in Shansi, and one from Mr. R. C. Ching, who collected in Kansu.

Among these specimens the following appear to represent undescribed species:

***Diheteropogon hagerupii* Hitchc., sp. nov.**

D. grandifloro spiculis et aristas minoribus, laminis basi cordatis differt.

The specimens consist of the upper part of the culms only but the label states that the height is 1.5 meters. Culms and nodes glabrous; sheaths glabrous; ligule a membrane about 1 mm. long; blades of the inflorescence flat or folded, cordate-clasping at the widened base, this about 1 cm. wide, the upper ones successively smaller; branches fasciated in the upper sheaths, each bearing a long peduncle with 1 node and a long sheath with a much reduced blade, these branches 10 to 15 cm. long, bearing a pair of erect racemes; racemes, excluding awns, 2 to 3 cm. long, one sessile, the other with a peduncle about 4 mm. long; sessile raceme with a pair of sterile spikelets at base and 3 or 4 pairs of heterogamous spikelets above; peduncled raceme with 4 or 5 pairs of heterogamous spikelets; sessile fertile spikelet 9 mm. long including the slender acuminate callus 3 mm. long, this densely pubescent except for a glabrous line on one side; first glume somewhat indurate, 6 mm. long, pubescent on the sides, a deep cleft in the lower 4 mm. of the back, the upper 2 mm. flat, the joint of the rachis nearly as long as the glume, densely villous on the sides, the oblique summit excavated; second glume a little shorter than the first, pubescent; fertile lemma with 2 thin slender teeth 2 mm. long, the stout awn arising between; awn twice geniculate, the first segment 2 cm. long, brown, villous, twisted, the second

segment similar but a little shorter, the third segment straight, slender, scabrous, about 4 cm. long.

Type in the U. S. National Herbarium, no. 1,445,573, collected in a dry locality at Bara near Ansongo, Soudan Français, September 24, 1927, by O. Hagerup (no. 401).

***Panicum glaucifolium* Hitchc., sp. nov.**

Planta glauca; culmi graciles, glabri, 100 cm. alti; laminae planae, glabrae, 15-20 cm. longae, 4-5 mm. latae, basi supra pubescentes; panicula patens, 15-20 cm. longa, ramis gracilibus ascendentibus, 7-10 cm. longis; spiculae glabrae, acutae, 4 mm. longae; gluma prima acuta, 2 mm. longa.

Plant glaucous; culms slender, glabrous, apparently erect, 100 cm. tall; sheaths glabrous or sparingly villous, sometimes villous around the summit; ligule a dense ciliate line less than 1 mm. long; blades spreading or ascending, flat, glabrous or scabrous on the upper surface toward the acuminate tip, villous on upper surface at base or sometimes above the base, 15 to 20 cm. long, 4 to 5 mm. wide; panicle open, 15 to 20 cm. long, about 10 cm. wide, the branches ascending, slender, the lower solitary, 7 to 10 cm. long, naked on the lower half or third, the branchlets appressed; spikelets pale, glabrous, acute, gaping, about 4 mm. long, the pedicels sometimes with a few long hairs at the summit; first glume acute, about half as long as the spikelet, mostly 5-nerved; second glume acuminate, about 9-nerved, the nerves rather prominent; sterile lemma a little shorter than the second glume, obtusish, about 9-nerved, staminate; fertile lemma about 2 mm. long, pale.

Type in the U. S. National Herbarium, no. 1,445,576, collected near water at Zinder, Colonie du Niger, alt. 360 meters, November 13, 1927, by O. Hagerup (no. 616).

This species differs from *P. coloratum* in the larger spikelets and the longer more acute first glume. The Hagerup specimens show only the upper half of the culms but the label states the height to be 1 meter.

***Panicum nigerense* Hitchc., sp. nov.**

Culmi ascendentes, glabri, 100 cm. alti; vaginae glabrae marginibus dense villosis; laminae planae, basi ciliatae; panicula patens, ovalis, 20-30 cm. longa, ramis ramulisque patentibus vel ascendentibus, axillis villosis; spiculae lanceolatae, acuminatae, glabrae, 5-6 mm. longae; gluma prima, acuta, 2.5-3 mm. longa.

Culms glabrous, ascending, 100 cm. tall, sheaths glabrous, densely ciliate on the margins; ligule a densely ciliate membrane about 2 mm. long; blades flat, glabrous beneath, scabrous on the upper surface, ciliate toward the base, villous above the ligule, the uppermost 4 mm. wide; panicle oval, open, 20 to 30 cm. long, the branches and branchlets spreading or ascending, the lower branches 15 cm. long, the branchlets bearing 2 or 3 spikelets toward the tip, the main axils villous; spikelets lanceolate, acuminate, glabrous, 5 to 6 mm. long, pale or tinged with purple; first glume acute, 3-nerved, about half as long as the spikelet;

second glume and sterile lemma equal, acuminate, about 7-nerved, the sterile floret staminate; fertile lemma elliptic, yellowish, a little more than 3 mm. long.

Type in the U. S. National Herbarium, no. 1,445,575, collected in dry locality, Niamey, Colonie du Niger, October 9, 1927, by O. Hagerup (no. 481).

Only the upper parts of the culms are present, with a single uppermost leaf. The label states that the plant is "1 m., ascendens." The species appears to be allied to *P. miliaceum* but differs in the glabrous sheaths, erect open panicle and narrower spikelets.

***Pennisetum molle* Hitchc., sp. nov.**

Laminae planae, hispidulae, 7-16 mm. latae, basi cordatae vel subcordatae; spica erecta, mollis, pallescens, solitaria, 5-10 cm. longa, 12-15 mm. lata, involuclis sessilibus, numerosis, dense confertis, 2-floribus; setae numerosae, graciles, erectae, inaequales, exteriores minores, interiores plumosae, 1 cm. longae; spiculae 6 mm. longae.

Culms glabrous, pubescent below the spike, the nodes pubescent; sheaths glabrous or roughened with papillae, these sometimes bearing stiff hairs, the collar pubescent; ligule of stiff hairs 2 to 3 mm. long; blades flat, thin, sparsely hispid on both surfaces, rounded or cordate at base, long-acuminate, about 15 cm. long, 5 to 15 mm. wide; spike solitary, erect, pale yellow or stramineous, 5 to 10 cm. long, 12 to 15 mm. wide, the axis villous; involucre densely crowded, sessile, 2-flowered; bristles numerous, erect, one a little longer than the others, the outer scabrous, shorter than the inner plumose ones, these about 1 cm. long; spikelets lanceolate, glabrous below, scaberulous above, about 6 mm. long; first glume one-third as long as the spikelet.

Type in the U. S. National Herbarium, no. 1,445,572, collected in dry locality at Gao, Soudan Français, September 13, 1927, by O. Hagerup (no. 340).

Also collected at Timbuktu, Soudan Français, by O. Hagerup (no. 194).

The specimens show only the upper part of the culms with 2 or 3 of the upper leaves. The height of the plants is given on the label as 0.5 meter.

***Leptochloa longiglumis* Hitchc., sp. nov.**

Planta annua; culmi erecti, glabri, 30-50 cm. alti; vaginae villosae; laminae planae, parce villosae, 5-10 cm. longae, 2-4 mm. latae; panicula 10-15 cm. longa, spicis 10-20, 2-4 cm. longis; spiculae appressae, circ. 5 mm. longae; glumae subulato-acuminatae, quam flores paulum longiores; lemmata 3-4, 2.5-3 mm. longa, pubescentia, nervis lateralibus dense villosis.

Plant annual; culms erect, branching, glabrous, 30 to 50 cm. tall; sheaths rather sparsely villous; ligule membranaceous, truncate-erose, 1 mm. long; blades flat, sparsely villous, 5 to 10 cm. long, 2 to 4 mm. wide; panicle erect or slightly curved, 10 to 15 cm. long, the spikes 10 to 20, straight or slightly falcate, ascending, 2 to 4 cm. long, 1 to 3 at a node, distant 1 to 1.5 cm. on the axis; spikelets appressed, slightly pedicelled, about 5 mm.

long, somewhat overlapping, about 4-flowered, glumes narrow, subulate-acuminate, a little longer than the florets; lemmas 2.5-3 mm. long, slightly keeled, appressed-pubescent, the lateral nerves densely villous-ciliate, awned from a cleft apex, the awn slender, straight, 0.5 to 1.5 mm. long.

Type in the U. S. National Herbarium, no. 1,445,574, collected at Labezanga, Soudan Français, September 29, 1927, by O. Hagerup (no. 453).

***Eragrostis hagerupii* Hitchc., sp. nov. (Sect. Pteroaessa).**

Planta perennis; culmi erecti, glabri, graciles, 100 cm. alti; vaginae glabrae, summo villosae; laminae angustae, involutae, versus apicem scabrae; panicula contracta, nutans, circ. 30 cm. longa; spiculae lineares, 10-12-fl., 4-7 mm. longae; lemmata scaberula, circ. 1.8 mm. longa.

Plant perennial; culms erect, glabrous, slender, 100 cm. tall; sheaths glabrous, villous at summit; ligule a dense ciliate ridge 0.5 mm. long; blades narrow, involute, attenuate to a slender point, scabrous toward the tip, 10 to 15 cm. long; panicle yellowish-drab, nodding, contracted, about 30 cm. long; spikelets linear, 10 to 12-flowered, 4 to 7 mm. long; glumes acute, 1.5 and 2 mm. long; lemmas slightly keeled, scaberulous, about 1.8 mm. long, the nerves not prominent.

Type in the U. S. National Herbarium, no. 1,445,577, collected near mangroves, at Lagos, Nigeria, December 16, 1927, by O. Hagerup (no. 784).

***Oryzopsis chinensis* Hitchc., sp. nov.**

Planta perennis; culmi erecti, caespitosi, glabri, 60-70 cm. alti; laminae graciles, filiformes, involutae, scabrae, 15-25 cm. longae; panicula ovalis, patens, 15 cm. longa, ramis binis, distantibus, gracilibus, 5-7 cm. longis; glumae aequales, glabrae, acutae, 3.5-4 mm. longae; lemma ellipticum, pubescens, flavescens, 2.5 mm. longum, callo brevissimo obtuso glabro; arista decidua, flexuosa, non geniculata, scabra, 5-7 mm. longa.

Perennial; culms erect, caespitose, glabrous, 2-noded, the upper node below the middle of the culm; sheaths glabrous or very slightly roughened; ligule a very short membrane (0.3 mm. long); blades involute, setaceous or filiform, flexuous, slightly scabrous, the basal about half as long as the culms, the upper culm blade about 5 cm. long; panicle oval, open, about 15 cm. long, the branches in pairs, slender, 5 to 7 cm. long, branched toward the ends; spikelets clustered toward the ends of the branches; glumes equal, acute, glabrous, 3.5 to 4 mm. long; lemma elliptic, yellow or brownish, pubescent with light hairs, 2.5 mm. long, the callus very short, obtuse, glabrous or nearly so; awn deciduous, curved but not geniculate, scabrous, 5 to 7 mm. long.

Type in the U. S. National Herbarium, no. 1,445,578, collected by mountain path, southern Shansi, China, alt. 1200 meters, May 18, 1929, by T. Tang (no. 788).

This species has more slender blades and smaller spikelets than other Chinese species.

***Poa alta* Hitchc., sp. nov.**

Planta perennis; culmi erecti, scabri, circ. 100 cm. alti; vaginae scabrae; laminae planae, scabrae, 30 cm. longae, 2-4 mm. latae; panícula angusta, straminea, 12 cm. longa, ramis erectis; spiculae circ. 4-fl., 4-6 mm. longae; glumae subaequales, quam spiculae paulum breviores; lemmata 4 mm. longa, basi paulum arachnoidea, nervis mediis marginalibusque pubescentibus.

Plant perennial; culms erect, apparently solitary, scabrous, about 100 cm. tall; sheaths scabrous; ligule about 2 mm. long; blades elongate, flat, scabrous, about 30 cm. long, 2 to 4 mm. wide, the uppermost blade below the middle of the culm, about 15 cm. long; panicle narrow, about 12 cm. long, the branches in pairs, appressed, naked below, the lowermost 5 cm. long; spikelets stramineous, about 4-flowered, 4 to 6 mm. long, the two upper florets reduced and scarcely longer than the lower florets; glumes nearly equal, a little shorter than the spikelet; lemmas (the 2 lower) 4 mm. long, the keel and marginal nerves pubescent on the lower half, the base with a few cobwebby hairs.

Type in the U. S. National Herbarium, no. 1,445,582, collected on open slope of mountain below summit, at Ning-wu Hsien, northern Shansi, China, alt. 2500 meters, August 21, 1929, by T. Tang (no. 1439).

This species is unusually tall, with elongate blades.

***Poa debilior* Hitchc., sp. nov.**

Planta flaccidissima; culmi tenues, retrorsum scabri, 20-30 cm. alti; vaginae retrorsum scabrae; laminae planae, glabrae, 5-8 cm. longae, 1 mm. latae; panícula patens, parva, 7 cm. longa, ramis paucis, gracilibus; spiculae 2-fl., 2.5 mm. longae; lemmata acuta, 2 mm. longa, minute hispida, basi non arachnoidea, nervis mediis pubescentibus.

Plants very weak and flaccid; culms slender, retrorsely scabrous, 20-30 cm. tall; sheaths retrorsely scabrous; ligule acute, about 1 mm. long; blades flat, glabrous, 5 to 8 cm. long, 1 mm. wide; panicle open, small, about 7 cm. long, the branches solitary, few, slender, 2 to 3 cm. long, bearing spikelets on the upper half; spikelets 2-flowered, 2.5 mm. long; glumes narrow, acute; lemmas elliptic, minutely hispidulous, 2 mm. long, not cobwebby at base, the keel pubescent.

Type in the U. S. National Herbarium, no. 1,445,581, collected in a watery crevice, at Ning-wu Hsien, Shansi, China, alt. 2000 meters, August 21, 1929, by T. Tang (no. 1435).

Characterized by the very slender weak habit and small spikelets.

***Poa shansiensis* Hitchc., sp. nov.**

Planta perennis; culmi tenues, erecti, caespitosi, glabri, 30-40 cm. alti; laminae flaccidae, 1 mm. latae; panícula parva, patens, 2-6 cm. longa, ramis binis, paucis, gracilibus, ascendentibus; spiculae paucae, stramineae, 3-5-fl., 5 mm. longae; glumae acutae, 2-2.5 et 3-3.5 mm. longae; lemmata glabra, basi arachnoidea, 3-3.5 mm. longa.

Plant perennial; culms slender, erect, caespitose, glabrous, mostly 2-noded,

30 to 40 cm. tall; sheaths glabrous; ligule 1 mm. long; blades flaccid, glabrous, scabrous toward the apex, 1 mm. wide, the uppermost culm blade 2 to 3 cm. long; panicle open, 2 to 6 cm. long, the branches few, in pairs, ascending, naked below, 1 to 3 cm. long, bearing 1 or 2 spikelets; spikelets few, stramineous, 3-5 flowered, about 5 mm. long, the internodes of rachilla about 1 mm. long; glumes acute, 2 to 2.5 and 3 to 3.5 mm. long; lemmas glabrous except for a few cobwebby hairs at base, obtusish and scarious at apex, the nerves rather prominent.

Type in the U. S. National Herbarium no. 1,445,580, collected in a shaded place at Mien-shan, Lin-shib Hsien, southern Shansi, China, alt. 1600 meters, May 30, 1929, by T. Tang (no. 906).

Poa tangii Hitchc., sp. nov.

Planta perennis; culmi erecti, 40 cm. alti; laminae planae, glabrae, 1-2 mm. latae; panicula patens, 2-6 cm. longa, ramis binis, patentibus; spiculae circ. 4-fl., 6-8 mm. longae, lucidae; glumae 3 et 4 mm. longae; lemmata obtusa, 4-4.5 mm. longa, basi non arachnoidea, nervis mediis marginalibusque pubescentibus.

Plant perennial, bearing slender rhizomes; culms erect, glabrous, 40 cm. tall; sheaths glabrous; ligule truncate, 1 mm. long; blades flat, soft, those of the culm 1.5 to 3 cm. long, 1 to 2 mm. wide; panicle small, open, 2 to 6 cm. long, the branches spreading or ascending, in pairs, the lower 2 to 3 cm. long; spikelets 1 to 3 at the ends of the branches, 4-flowered, 6 to 8 mm. long, shining; glumes 3 and 4 mm. long; lemmas obtuse, 4 to 4.5 mm. long, the apex hyaline, the base not cobwebby, the keel and marginal nerves pubescent on the lower half.

Type in the U. S. National Herbarium, no. 1,445,579, collected in a shady ravine at Me-chaio-ku village, Ping-yao, Hsien, Shansi, China, alt. 1700 meters, May 21, 1929, by T. Tang (no. 835).

Stipa chingii Hitchc., sp. nov.

Planta perennis; culmi caespitiosi, graciles, erecti, circ. 80 cm. alti; vaginae glabrae; laminae filiformes, flexuosae, scaberulae, 15-20 cm. longae; panicula patula, 15-20 cm. longa, ramis capillaribus, scabris; glumae subaequales, 7-9 mm. longae, obtusae; lemma circ. 6 mm. longum, pubescens; arista circ. 13 mm. longa, geniculata.

Perennial, caespitose; culms slender, erect, about 80 cm. tall; sheaths glabrous; ligule of culm leaves firm, 2 to 3 mm. long; blades filiform, flexuous, scaberulous, 15 to 20 cm. long; panicles loose, open, 15 to 20 cm. long, the branches capillary, scabrous; spikelets toward the ends of the branches; glumes subequal, 7 to 9 mm. long, obtuse; lemma about 6 mm. long including the callus about 1 mm. long, narrowed upward, rather sparsely pubescent on the lower half; awn twice geniculate, the lower bend obscure, pubescent below, scabrous above, the first section about 1 mm. long, the second 4 mm. long, the third 8 mm. long.

Type in the U. S. National Herbarium, no. 1,245,799, collected in open woods, alt. 4000 meters, at Labrang, Kansu, China, by R. C. Ching (no. 785).

This species differs from *S. sibirica* Lam. in the filiform blades, the smaller spikelets, and the less pubescent lemma. It may be the same as *S. sibirica* var.? *pallida* Hook. f. (not *Stipa pallida* Kuntze).

***Stipa purpurascens* Hitchc., sp. nov.**

Planta perennis; culmi caespitosi, erecti, glabri, circ. 20 cm. alti; vaginae glabrae; ligula acuta, 5 mm. longa; laminae filiformes, scabrae, involutae, 10–15 cm. longae; panicula angusta, pauciflora, purpurea, 2–5 cm. longa, axi glabro, ramis erectis; glumae aequales, 12 mm. longae; lemma fuscum, pubescens, 7 mm. longum; arista pilosa, circ. 12 mm. longa.

Perennial; culms cespitose, erect, glabrous, about 20 cm. tall; sheaths glabrous; ligule acute, about 5 mm. long on the culm leaves, about 2 mm. long on the innovations; blades erect, filiform, scabrous, involute, those of the innovations 10 to 15 cm. long, those of the 2 culm leaves 2 to 3 cm. long; panicle narrow, few-flowered, dark purple, 2 to 5 cm. long, the axis glabrous, the branches appressed; glumes equal, about 12 mm. long; lemma cylindrical-fusiform, pubescent, pilose toward the summit, about 7 mm. long including the pilose callus about 1 mm. long; awn once-geniculate, about 12 mm. long, the first segment slightly twisted, pilose, the second segment straight, scabrous.

Type in the U. S. National Herbarium, no 1,245,701, collected south of Sining, in the La Che Tze Mountains, Kansu Province, China, 3350 to 3900 meters alt., by R. C. Ching (no. 686).

***Avena suffusa* Hitchc., sp. nov.**

Planta perennis; culmi erecti, 100 cm. alti; laminae angustae, involutae, scabrae; panicula ovalis vel oblonga, condensata, suffusa, 3–6 cm. longa, axi pubescente; spiculae 2-fl., rachilla pilosa; glumae aequales, glabrae, 1 cm. longae; lemmata scabra, 8 mm. longa, callo piloso; arista geniculata, 1 cm. longa.

Perennial; culms erect, about 1 meter tall, puberulent below the panicle; scaberulous below the nodes; sheaths glabrous or minutely scabrous; ligule a short ciliate membrane; blades involute, scabrous, narrow, those of the culm 2, 1 to 3 cm. long, those of the innovations 20 to 30 cm. long; panicles oval or oblong, condensed, brownish, 3 to 6 cm. long, the axis and branches pubescent; spikelets 2-flowered, the rachilla pilose; glumes equal, glabrous, 1 cm. long, the first 1-nerved, the second 3-nerved; lemmas scabrous, pilose on the callus, about 8 mm. long; awn inserted a little above the middle, geniculate, a little twisted below the bend, about 1 cm. long; palea about as long as the lemma, pubescent, the prolongation of the rachilla pilose.

Type in the U. S. National Herbarium, no. 1,245,557, collected at Ta Hwa, near Pingan, Province of Kansu, China, at 2900 to 3100 meters alt., July 17, 1923, by R. C. Ching (no. 527).

Other specimens, both from Kansu, are:

La Chang K'on, near Sining, 300 to 3300 meters alt., *Ching* 627;

La Che Tze Mountains, 3350 to 3900 meters, *Ching* 687.

The species belongs to the Section *Avenastrum*.

***Avena altior* Hitchc., sp. nov.**

Planta perennis; culmi erecti, glabri, 100-120 cm. alti, nodis pubescentibus; laminae planae, pubescentes, 3-5 mm. latae; panícula patula, angusta, 15 cm. longa, axi glabro, ramis verticillatis, gracilibus, flexuosis, scabris, 2-4 cm. longis; spiculae circ. 4-fl., 1 cm. longae, rachilla pilosa; glumae acutae, inaequales, 5 et 10 mm. longae; lemmata glabra, primum 9 mm. longum, callo piloso; arista geniculata, 1 cm. longa.

Perennial; culms erect, glabrous, 100 to 120 cm. tall, the nodes pubescent; sheaths glabrous; ligule a truncate membrane scarcely 1 mm. long; blades flat, pubescent, 3 to 5 mm. wide; panicle open, 15 cm. long, the axis glabrous; branches slender, spreading, flexuous, scabrous, several at each node, naked below, 2 to 4 cm. long, bearing 1 to 3 spikelets, the lower nodes 2 to 3 cm. apart; spikelets about 4-flowered, about 1 cm. long, the third and fourth florets reduced; the rachilla short-pilose; glumes unequal, the first 5 mm. long, the second 10 mm. long; lemmas glabrous except the pilose callus, the first about 9 mm. long, the second a little shorter; awn attached just above the middle, geniculate, somewhat twisted below, about 1 cm. long.

Type in the U. S. National Herbarium, no. 1,245,731, collected south of Sining, in the La Che Tze Mountains, Kansu Province, China, 3350 to 3900 meters alt., by R. C. Ching (no. 716).

This species belongs to the Section *Avenastrum*.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE WASHINGTON SPECIES OF DRABA

BY EDWIN BLAKE PAYSON AND HAROLD ST. JOHN.

The genus *Draba*, a member of the *Cruciferae*, is well represented in western North America. In the State of Washington one or more species are to be found in nearly every part. The arid plains of eastern Washington produce several species. These are all annuals, that shoot up with the first warm days of February or March. Until April they form a conspicuous part of the vegetation, carpeting the grassy slopes with white or yellow. As soon as the warm dry summer comes, they dry up, drop their seeds, and disappear. In western Washington they are also to be found, chiefly in sandy places at low elevation. The only one of the annuals that can be considered a montane species is *D. stenoloba*. Most of the annuals have broad ranges, occurring over a large part of the continent. They have been carefully studied and well classified elsewhere.

The perennials have proven a much more interesting group. One of these, *D. Douglasii*, occurs east of the Cascade Mountains, on the dry stony foothills, and *D. caeruleomontana* with its var. *Piperi* is found in the Blue Mountains. *D. Douglasii* is the species with its pods so swollen, subovoid in shape, that its right to a place in the genus *Draba* is questionable. Dr. Gray first proposed to call it the new genus *Cusickia*, then published it as *Draba Douglasii*, then later renamed it as *Braya oregonensis*. The other perennials are all montane species, mostly low matted cushion-like plants. Dr. Piper knew four species of the perennials from the State at the time of the publication of his *Flora of Washington* in 1906. This interpretation remained unchanged in Piper and Beattie's subsequent

¹Contribution from the Department of Botany of the State College of Washington, No. 18.

books, the Flora of Southeastern Washington in 1914, and the Flora of the Northwest Coast in 1915. Since then the Blue Mountains, the Cascade Mountains, and the Olympic Mountains have yielded treasures. Each mountain peak is likely to have one or two species of perennial *Drabas*. These are often very local or endemic species, and, as is here demonstrated, a number of them are new species.

This joint study was begun with Dr. Payson two years before his death.¹ Though it has been necessary for the later author to complete it alone, the manuscript was in an advanced state of preparation, and the opinions here expressed truly represent those of the two authors.

The most valuable specific characters have been found in the habit and duration of the plant, the shape and size of the pod, the color of the flower, the shape and size and nature of the leaves, and especially in the kind and location of the pubescence on the leaves. Curiously enough, such characters as the presence of cilia, of branched or stellate hairs on the leaves seem to be the most constant and diagnostic points. On the other hand, the pubescence of the pod is of relatively little value. There are several pairs of plants that differ conspicuously by one of the pair having glabrous pods, and the other having markedly pubescent pods. Some botanists treat these as distinct species. However, the two have identical ranges, or over-lapping ranges. In the second case, the rarer one appears occasionally and then always within the range of the commoner and more widely dispersed plant. No other characters have been detected to separate the two. They are identical in every regard but the pubescence or lack of pubescence on the pod. In such cases, one plant is here considered to be a variety of the other.

Unless otherwise indicated the specimens studied and cited are in the Rocky Mountain Herbarium or in the Herbarium of the State College of Washington. In order to understand the relationship of the new species here proposed to the older species, it has been necessary to compare them with the types or with authentic material of the later. It is a pleasure to express hearty thanks for the loan of such valuable material, by Dr. B. L. Robinson of the Gray Herbarium, by Dr. William R. Maxon of the U. S. National Herbarium, and by Dr. W. A.

¹Edwin Blake Payson died in Denver, Colo., on May 15, 1927.

Setchell of the University of California. The librarians of the Missouri Botanical Garden and of Stanford University have kindly aided the writers by the loan of rare books.

KEY TO THE WASHINGTON SPECIES OF DRABA.

- A. Annuals, not caespitose,
 - B. Petals deeply bifid, white; pods 3–7 mm. long, at least the lower much shorter than the pedicels,
 - C. Pods broadly elliptic to obovate,.....1. *D. verna*, var. *Boerhaavi*.
 - C.' Pods elongate, oblong or lance-oblong,.....1a. *D. verna*, var. *major*.
 - B.' Petals entire or emarginate,
 - D. Petals white; flowers dimorphous,
 - E. Inflorescence in fruit short and compact; leaves mostly basal,
 - F. Leaves coarsely hispid above with simple hairs.....
2. *D. caroliniana*, subsp. *typica*.
 - F.' Leaves hoary above with forked hairs,
 - G. Pods hispidulous with mostly simple hairs,.....
2a. *D. caroliniana*, subsp. *stellifera*.
 - G.' Pods glabrous,.....
2b. *D. caroliniana*, subsp. *stellifera*, var. *Hunteri*.
 - E.' Inflorescence in fruit a long raceme; stems leafy,.....
3. *D. viperensis*.
 - D.' Petals yellow; inflorescence in fruit elongate; flowers all alike and not cleistogamous,
 - H. Pods 3–10 mm. long; pedicels usually much longer than the pods,
 - I. Pods puberulent,.....4. *D. nemorosa*.
 - I.' Pods glabrous,.....4a. *D. nemorosa*, var. *leiocarpa*.
 - H.' Pods 10–15 mm. long; pedicels mostly shorter than the pods.....5. *D. stenoloba*.
- A.' Perennials, or biennials,
 - J. Plant leafy stemmed,
 - K. Biennial; style 1–2 mm. long; pods broadly elliptic to oblong, 4–5 mm. wide,.....6. *D. aureola*.
 - K.' Perennial; style about 0.1 mm. long; pods lanceolate to narrowly oblong, 2–3 mm. wide,.....7. *D. cascadenis*.
 - J.' Plant scapose or nearly so,
 - L. Style 0–0.5 mm. long; leaves stellate pubescent,
 - M. Pods linear, usually twisted, 10–15 mm. long,
 - N. Stems glabrous, or at least so above,
 - O. Pods glabrous,.....8. *D. lonchocarpa*.
 - O.' Pods puberulent on the margins,.....
7a. *D. lonchocarpa*, var. *semitonsa*.
 - N.' Stems and pedicels stellate pubescent,.....
8b. *D. lonchocarpa*, var. *vestita*.
 - M.' Pods ovate-lanceolate, 2–5 mm. long,.....
9. *D. novolympica*.

- L.' Style 0.5-2 mm. long,
 P. Leaves with simple cilia, lacking any stellate or branched hairs,
 Q. Pods subovoid; flowers white; cilia on leaves short and weak,.....10. *D. Douglasii*.
 Q.' Pods strongly flattened; flowers yellow; cilia long and stout,.....11. *D. Nelsonii*.
 P.' Leaves with some branched or stellate hairs,
 R. Leaves oblanceolate to suborbicular,.....
 12. *D. ruaxes*.
 R.' Leaves linear or slightly spatulate,
 S. Leaves with few stellate or branched hairs, prominently ciliate with stout distant simple cilia,
 T. Pods puberulent with simple or forked hairs,.....13a. *D. caeruleomontana*,
 var. *Piperi*.
 T.' Pods glabrous,.....13. *D. caeruleomontana*.
 S.' Leaves with many branched or stellate hairs,
 U. Leaves linear, strongly ciliate to the tip, loosely pubescent with hispid and branched hairs,.....14. *D. Paysonii*.
 U.' Leaves narrowly linear-oblanceolate, ciliate towards the base, softly stellate with short more or less appressed hairs,
 V. Pods puberulent,.....15. *D. incerta*.
 V.' Pods glabrous,.....
 15a. *D. incerta*, var. *laevicapsula*.

1. *Draba verna* L., var. *Boerhaavii* Van Hall, Specim. bot. 149, 1821.

Erophila Boerhaavii (Van Hall) Dumort. Fl. Belg. 120, 1827.

Erophila spathulata Lang, Syll. Soc. Ratisb. 1: 180, 1824.

Annual, rosulate at base; roots fibrous and with a slender taproot; leaves all basal, obovate-spatulate subacute, entire or 1-3-dentate on each side narrowed into a petiole, pubescent above and somewhat so beneath with mostly branched hairs, petioles ciliate with simple hispid hairs, 4-20 mm. long, 2-5 mm. broad; stems one to several, pubescent below with short simple or branched hairs, glabrous above, 1-10 cm. tall; inflorescence racemose, becoming loosely so after anthesis, 5-10-flowered; pedicels slender, flexuous ascending, glabrous, 5-20 mm. long; flowers small, 1-2 mm. long; sepals obovate green, yellowish or whitish hyaline on the margins, 1-1.4 mm. long, glabrous or hispid; petals white, cleft to about the middle into two elliptic lanceolate lobes, 1-2 mm. long; stamens 6, anthers globose 0.3 mm. long, filaments linear; nectar glands conical lateral, i. e. at the base of the short filaments; pods glabrous veiny, broadly elliptic to obovate, 3.5-6 mm. long, 3-4 mm. broad, style minutely apiculate.

DISTRIBUTION: Upper Sonoran and Humid Transition. TYPE: On an old city wall of Delft, in abundance, *J. Van Spyk Vermeulen*.

BENTON COUNTY: Gravelly beach of Columbia River, Paterson, April 9, 1927, *St. John, English, Jones & Mullen* 8066.

KLICKITAT COUNTY: Very abundant at Bingen, April 11, 1921, *Suksdorf* 10702.

SKAGIT COUNTY: Anacortes, April 11, 1925, *Edith Hardin*; clay bank, Anacortes, April 12, 1925, *Hardin*; rocky bluff, Weaverling's Spit, near Anacortes, April 25, 1925, *Hardin*.

SPOKANE COUNTY: Near Fort Wright, April 3, 1920, *Nettie M. Cook*.

WHITMAN COUNTY: Rocky hillside, Wawawai, April 2, 1927, *Brigido Villanueva*; Wawawai, April 2, 1927, *Thos. Onstott*; slopes of Wawawai Canyon, March 6, 1921, *St. John* 5881.

It is not an original observation to notice variation within the Linnean species *Draba verna*. Many botanists, especially those of Europe, have distinguished and named these variants. Depending on the view-point of the worker, these have been given every rank from forma to species, and the species kept in *Draba* or made the separate genus *Erophila*. The plants have been shown to be cleistogamous. As a result of this method of fertilization, many small variants or races have arisen within the group. These breed true and usually have natural, though very restricted ranges. The French botanist Alexis Jordan described over 200 of these as elementary species. Few botanists of the present time consider them all of specific value, but the majority of the recent European workers give them a taxonomic status. Noteworthy among these botanists are Is. Maranne, G. C. Druce, and O. E. Schulz.

Draba verna has been considered an introduced species in North America. Perhaps from this reason and perhaps from the fact that it is relatively uncommon in the eastern and older settled parts, it has been given but little study. It is almost a fixed tradition among the botanists of North America to discount or overlook any variation in the species and call all collections of it *Draba verna*.

In the State of Washington the plant is very abundant on the arid plains of the eastern part. It is occasional at low elevation near Puget Sound in western Washington. Here the plants have short rounded pods, so conspicuously different from the long narrow ones of the east side plants, that even beginning students notice the difference and are puzzled by it. On investigating them, it was obvious that they had ranges that only partially overlapped and had morphological characters that were relatively constant and conspicuous. Hence these two variants are being maintained by the writers.

A number of the botanists who have made a prolonged study of the group segregate it as the genus *Erophila*. These include Is. Maranne¹ and O. E. Schulz.² The only tangible character to justify this is the possession of two-lobed petals, instead of the entire, or frequently emarginate, or shallowly lobed ones of *Draba*. To the writers this solitary

¹Bull. Soc. Bot. France 60: 379, 1913.

²Pflanzenreich iv. fam. 105: 343, 1927.

character, though a morphological one of the flower, seems to be one of degree only, and to be relatively unimportant. The lack of any important correlated characters, of any difference in habit, or in range, convince them that these annual plants with cleft petals are best kept in the genus *Draba*. In agreement with this point of view are Dalla Torre and Harms, Engler and Prantl, Halacsy, and many others.

1a. *D. verna* L., var. *major* Stur, Oester. Bot. Zeitschr. 11: 153, 195, 1861.

Erophila majuscula Jord. Pugill. 11, 1852; Diagn. 244, 1864.

Draba verna L., var. *majuscula* (Jord.) Grenier, Fl. Jurass. 63, 1865.

Annual, similar to var. *Boerhaavii*, but the leaves often more coarsely dentate; the petals 2.5–4 mm. long; and the pods elongate, oblong or lance-oblong, 5–8 mm. long, 1.5–2.5 mm. broad.

DISTRIBUTION: Upper Sonoran and Arid Transition. TYPE: Bucovinae (Rumania).

ASOTIN COUNTY: Grassy hillside, Birch Creek, T. 7 N., R. 47 E., May 22, 1927, *St. John* 8166.

BENTON COUNTY: Muddy beach of Columbia River, Plymouth, April 9, 1927, *St. John, English, Jones & Mullen* 8046; gravelly beach of Columbia River, Paterson, April 9, 1927, *St. John, English, Jones, & Mullen* 8067.

FRANKLIN COUNTY: Palouse Falls, April 15, 1928, *Nettie M. Cook*.

SKAMANIA COUNTY: Dog Creek near Cooks, April 24, 1922, *Suksdorf* 10780.

SPOKANE COUNTY: Dry rocky bench above Bonnie Lake, May 30, 1923, *St. John, Pickett & Warren* 3197.

WALLA WALLA COUNTY: Walla Walla, April 20, 1898, *Leckenby*; rocky slopes, Waitsburg, April 18, 1898, *Hornor* 606.

WHITMAN COUNTY: Malden, April 27, 1922, *V. A. Griffeth*; grassy hillside, Pullman, April 23, 1927, *B. Villanueva*; dry open slopes, north bank of Palouse River, below Colfax, April 29, 1922, *St. John* 2974; hillsides, Wawawai Canyon, April 3, 1926, *G. N. Jones* 733; grassy hillside, head of Hatwai Creek, May 27, 1928, *St. John* 9523.

Field notes kept by Mr. St. John show that this plant is excessively common over most parts of eastern Washington at moderate elevation.

2. *D. caroliniana* Walt., subsp. *typica*, subsp. nov.

D. caroliniana Walt., Fl. Carol. 174, 1788.

Slender annual; roots small and fibrous; leaves mostly basal, forming a rosette, entire or rarely 3-denticulate, obovate or suborbicular-spathulate, cuneate at base or short petioled, rough pubescent with branched hairs, especially beneath, 5–15 mm. long; cauline leaves few, borne on the lower quarter of the scape-like stem, similar to the basal but pubescent above with mostly long simple hispid hairs; stem at anthesis 3–8 cm. tall, at fruiting time up to 14 cm. tall, slender, simple or frequently branched from the base, hispid below with simple and forked hairs, glabrous above; inflorescence sub-umbellate, becoming cymose or at times short racemose,

6-16-flowered; pedicels slender short 1-5 mm. long, glabrous; flowers dimorphous, the first and central branch and other strong branches bearing large petaliferous flowers, these with sepals ovate, sparsely hispid on the back or glabrous, 1.5-2 mm. long; petals white 3.5-4 mm. long, with a slender claw half as long as the blade, the blade obcordate, emarginate at the tip; stamens 6, anthers ellipsoid, 0.5 mm. long, filaments subulate; nectar glands wanting; cleistogamous flowers borne on weak lateral or late branches, sepals linear-oblong, sparsely hispid toward the tip or glabrous, 1-1.5 mm. long; petals narrowly spatulate, equaling the sepals or shorter or frequently entirely wanting; stamens 4 or 6, the anthers minute 0.2 mm. long, the filaments capillary; pods ascending, often in a subumbellate cyme, linear, straight or curved, somewhat cuneate at the base, rounded at the tip, compressed and flat, with a prominent midrib and visible netted lateral veins, glabrous, 1.3-2 mm. broad; style wanting; stigma small and depressed.

DISTRIBUTION: Zone not known. TYPE: None mentioned.

WASHINGTON: *Howell* in 1882 (according to O. E. Schulz); Cascade Mts., 1882, *Tweedy* 162.

There is a possibility that these collections did not come from the State of Washington. Their data is meager, and has perhaps been confused. This true species has not been re-collected in the State. However, O. E. Schulz in his treatment in the *Pflanzenreich* cites another *Howell* collection from Umatilla, Oregon, which is just across the Columbia River from Washington. All other collections that he cites are from east of the Rocky Mountains.

The new name subsp. *typica* applies to the original *D. caroliniana* Walt. The writers have no desire to complicate in an unnecessary way the nomenclature of this group, and they realize the reluctance of the botanists in America to adopt long cumbersome names with many subdivisions. In this case, *D. caroliniana* falls into five or six subdivisions, each with the characters that are considered of varietal value in this genus. Then the pubescence of the leaves assembles these into two groups which logically need names in a category superior to the variety. These are almost strong enough to be considered species, but they all have that habitual resemblance, which so often is the deciding factor in such cases. Hence the original *D. caroliniana* is here named as subsp. *typica*. Under this should be classified the var. *micrantha* (Nutt.) Gray, and probably the var. *dolichocarpa* O. E. Schulz, though material of this has not been examined.

2a. *D. caroliniana* Walt., subsp. *stellifera* (O. E. Schulz) comb. nov.

D. caroliniana Walt., f. *stellifera* O. E. Schulz, *Pflanzenreich* IV, fam. 105: 333, 1927.

Differing from the var. *micrantha* by having the upper leaf surface of the cauline leaves as well as the rest of the leaf rough pubescent with white branched hairs. The leaves are also sparsely ciliate with simple hispid hairs towards the base, and occasionally a few of these simple hairs are to be found on the upper surface near the petiolar base. The nature

and position of the pubescence on the leaves is one of the most constant and fundamental characters to be found in the genus *Draba*. On the other hand the pubescence or smoothness of the pods seems of minor importance, as there are many pairs of plants differing in no other way, occurring together and having no distinct ranges. Only in the far western part of North America are these plants with the branched pubescent cauline leaves to be found. Because of this fundamental character which is correlated with a geographic range, the plant is raised to the category subspecies.

DISTRIBUTION: Upper Sonoran. TYPE: Not indicated, but the specimens were from Idaho, Washington, and California. The first mentioned was Idaho: Upper Ferry, Clearwater River, Lewiston (J. H. Sandberg, D. T. MacDougal, A. A. Heller, 1892, n. 141).

GRANT COUNTY: Steep coulee slope, above Fish Hatchery, head of Crab Creek, n. e. of Moses Lake, March 31, 1921, *St. John* 6028.

SPOKANE COUNTY: Spokane, May 23, 1897, *Piper*.

WALLA WALLA COUNTY: Dry rocky south slopes, Waitsburg, March 27, April 22, 1897, *Horner* 74.

WHITMAN COUNTY: Almota, May 2, 1897, *Piper & Sheldon*; Snake River bluffs, Wawawai, April 17, 1897, *Piper* 2801.

YAKIMA COUNTY: North Yakima, May 27, 1892, *Henderson*.

2b. *D. caroliniana* Walt., subsp. *stellifera* (O. E. Schulz) Payson and St. John, var. *Hunteri* var. nov.

It differs from the subsp. *stellifera* only by having the pods glabrous.

A subsp. *stellifera* differt in siliquis glabris.

DISTRIBUTION: Upper Sonoran. TYPE: Ephrata, *St. John* 6006.

ASOTIN COUNTY: Sandy soil, Clarkston, March 17, 1900, *B. Hunter* 1.

GRANT COUNTY: Course red sand, ridge n. of Ephrata, April 1, 1921, *H. St. John* 6006 (type in Herb. State College of Washington).

YAKIMA COUNTY: Rattlesnake Hills, March 20, 1924, *Ramaley*.

The following specimen has also been examined from IDAHO: Lewiston, Nez Perce Co., March 17, 1900, *Hunter*.

3. *D. viperensis* St. John, sp. nov.

Slender annual; roots small white fibrous, with a definite taproot and thread-like laterals; basal leaves several, forming a rosette, but most of these leaves withering after anthesis, oblanceolate to obovate, narrowed to a short petiole, remotely few dentate near the tip, hispid with simple white hairs on the upper surface on the petiole and near the base, elsewhere densely white hispid with stellate and forked hairs, the petiole ciliate with simple hispid hairs, 5-20 mm. long, 3-10 mm. broad; cauline leaves 4-6, evenly distributed on the lower half of the plant, not or scarcely reduced upwards, ovate-lanceolate to elliptic-lanceolate or oblanceolate sessile, remotely but sometimes deeply dentate, similarly pubescent to the basal leaves, 5-26 mm. long, 2-15 mm. broad; stems slender, spreading white pilose with mostly stellate hairs, also with simple and forked hairs, 4-25

cm. tall, the large plants producing lateral branches from one or several of the upper nodes, these lateral branches markedly leafy up to the first flower; terminal inflorescence a loose raceme even during anthesis, 5–50-flowered, but only a minority of these setting fruit, similarly pubescent to the stems; pedicels slender, somewhat ascending, white pilose with mostly forked and stellate hairs, pedicels 5–12 mm. long; sepals hyaline margined, green becoming yellowish, the outer lanceolate-elliptic, the inner elliptic-obovate, 2 mm. long, markedly white simple pilose; petals white, with an obcordate blade tapering into the slender claw one third its length, 4 mm. long; stamens 6, 2–2.5 mm. long, the anthers cordate to suborbicular, 0.4 mm. long, the filaments subulate somewhat inflated at the base; nectar glands lateral, that is one on either side of each of the two short stamens, deltoid, conical, the median glands wanting; inflorescence of lateral branches short and subcymose at anthesis; sepals oblong-elliptic slightly unequal, 1–1.5 mm. long; petals similar in shape to those of the macranthous flowers but smaller unequally developed not exceeding the sepals or rarely one of them so doing; stamens 6, 1.5–1.7 mm. long, the anthers reniform to broadly cordate, 0.1 mm. long, the filaments filiform and narrowly deltoid at base; nectar glands none; pods flat compressed, broadly elliptic, white puberulent with ascending simple hairs, 5–8 mm. long, 2–3 mm. wide, not contorted, style wanting or nearly so; stigma depressed; ovules 30–48; mature seeds brown elliptical or oblong, flattened, 0.6–0.7 mm. long.

Annual, foliis rosulatis oblanceolatis vel obovatis petiolatis dentatis pilis simplicibus bifurcis stellatisque hispidis 5–20 mm. longis 3–10 mm. latis, foliis caulinis 4–6, inflorescentiis terminalibus laxe racemosis 5–50-floris, floribus dimorphis, petalis albis obcordatis 4 mm. longis, siliculis ellipticis puberulis 5–8 mm. longis 2–3 mm. latis.

DISTRIBUTION: Upper Sonoran. TYPE: Big Canyon Creek, Idaho, Skillin & Warren 720.

ASOTIN COUNTY: Rocky hillside, Buffalo Rock, T. 8 N., R. 47 E., May 29, 1927, *H. St. John, P. Gaona, G. N. Jones & F. Warren* 8251.

The following specimens from other States have also been examined:

OREGON: Grassy slopes, 1300 ft. alt., Somers Creek, T. 2 N., R. 50 E., Wallowa Co., May 8, 1927, *H. St. John* 8145; gravel slopes near mouth of Tryon Creek, 1100 ft. alt., T. 3 N., R. 50 E., Snake River Canyon, Wallowa Co., May 18, 1929, *St. John* 9828.

IDAHO: Dry rocky hillside near camp, Big Canyon Creek, T. 27 N., R. 2 W., Idaho Co., April 6, 1928, *J. H. Skillin & F. A. Warren* 720 (type in Herb. State College of Washington).

D. viperensis is a member of the Section *Tomostima*, which is remarkable for having dimorphic flowers. The terminal racemes bear large flowers with showy petals and nectar glands, while the lateral racemes have much smaller inconspicuous and apparently cleistogamous flowers with reduced petals, minute anthers and no nectar glands. The showy flowers often fail to set fruit, while the micranthous ones do so abundantly. This section contains six species of North and South America. The only one of these recognized species occurring in the Pacific Northwest is *D. caroliniana* Walt. with its subspecies. The species here described as new,

most closely resembles one native from Uruguay to Tierra del Fuego. The two may be distinguished as follows: *D. australis* R. Br. has the stem in fruit up to 10 cm. tall, branched from the base, long aphyllous above, appressed puberulent below, glabrous above; the cauline leaves often subopposite or subverticillate; the micranthous flowers with linear sepals and four stamens. *D. viperensis* St. John, on the other hand, has the stem in fruit up to 25 cm. tall, simple or branched from the upper axils, leafy to the inflorescence, spreading pubescent throughout, the cauline leaves alternate; and the micranthous flowers with oblong-elliptic sepals and six stamens.

This new species has been found only in the Snake River Canyon, from 20 to 70 miles upstream from Lewiston, Idaho. The Idaho and Oregon localities are within two miles of each other, but are on opposite sides of the Snake River and are in different States. In allusion to the name of the river and canyon, the specific name has been derived from the Latin *vipera*, a snake.

4. *D. nemorosa* L., Sp. Pl. 2: 643. 1753.

D. nemorosa L., var. *brevisiliqua* Zapalowicz, Rozpr. Wydz. Mathem.-Pryzr. Akad. Umiej. Ser. III, 12B: 238, 1912.

D. nemorosa L., var. *macrocarpa* Korshinsky, Tentam. Fl. Ross. Or. 37, 1898.

Annual, slender or often vigorous and tall; roots fibrous; basal leaves often forming a rosette, but in small plants sparse and scarcely so doing, oblanceolate to oblong-obovate, obtuse to subacute, tapering to a short petiole, entire or with a few serrate or denticulate teeth, pubescent throughout with white forked or stellate hispid hairs, 2-25 mm. long, 1-10 mm. broad; cauline leaves several remote borne on the lower portion of the main stem, though running well up on the lateral branches, oblong-lanceolate to elliptic-ovate, sessile usually rounded at base, serrate with a few remote teeth, hispid above with simple or two-forked hairs and below with forked or stellate hairs, 3-25 mm. long, 2-17 mm. broad; stem simple in small or depauperate plants, the larger plants producing numerous ascending lateral branches from the base or lower axils, white hispid below with simple, forked, and stellate hairs, glabrate above, 2-45 cm. tall; inflorescence at anthesis a short loose raceme, greatly elongating in fruit, in large plants the inflorescence is often several times the length of the rest of the plant, bearing 4-50 or more flowers; pedicels slender somewhat ascending or divergent, 5-25 mm. long, at least the lower usually much longer than the pods; sepals oblong-ovate yellowish, more or less simply pilose on the back, about 1.5 mm. long; petals pale yellow usually fading to whitish, oblong-spatulate narrowed to a claw below and deeply emarginate, 2.5 mm. long; stamens 6, 1.5-2 mm. long, the anthers orbicular-cordate, 0.2 mm. long, the filaments subulate; nectar glands lateral depressed conical; pods narrowly elliptic-oblong tapering to a cuneate base and an apiculate tip, puberulent with short simple ascending hairs, flat and compressed, 3-10 mm. long, 1.5-2.5 mm. broad; style wanting; stigma minute.

DISTRIBUTION: Upper Sonoran to Arid and Humid Transition. TYPE: In Sueciae nemoribus.

WASHINGTON: Cascade Mts., 1882, *Tweedy* 164.

BENTON COUNTY: Sandy shore of Columbia River, Hanford, April 7, 1927, *St. John, English, Jones & Mullen* 8117; gravelly beach of Columbia River, Paterson, April 9, 1927, *St. John, English, Jones & Mullen* 8068.

CHELAN COUNTY: Damp land near mouth of Wenatchee River, April 16, 1905, *Whited* 2591.

SAN JUAN COUNTY: Dry rocks near Station, Friday Harbor, July 28, 1923, *Peck* 13152.

SKAGIT COUNTY: Rocky bluff, Weaverlings Spit, Anacortes, April 25, 1925, *Hardin*.

SPOKANE COUNTY: Hangman Creek, 1510 feet, May 16, 1893, *Sandberg & Leiberg* 4; Spokane, April 20, 1913, *Turesson*.

WALLA WALLA COUNTY: Bottom land, Waitsburg, March 1, April 19, May 6, 1898, *Horner* 608.

WHITMAN COUNTY: In dry ground, Almota, April 7, 1894, *Piper*; dry slopes, n. bank Palouse River, below Colfax, April 29, 1922, *St. John* 2975; rare, in dry ground, Pullman, May 1, 1894, *Piper* 1794; in dry rocky places, Pullman, May 16, 1895, *Piper* 1794; in dry places, Pullman, April 5, 1895, *Cloud*; on basaltic outcroppings, Pullman, May 1897, *Elmer* 151; Pullman, May, 1899, *Hunter*; dry soil, low ground, Pullman, April 4, 1906, *Hunt & Kimmel* 70; dry hillside, Rock Lake, April 9, 1925, *St. John, Pickett & Warren* 6884, and 6891; along Snake River at Wawawai, April 17, 1897, *Piper* 2800; rocky slopes of Snake River Canyon above Wilma, April 16, 1922, *St. John* 3309; sunny ledge, Granite Point, March 12, 1921, *St. John & Pickett* 2992.

YAKIMA COUNTY: In bottoms of canyons, near springs, Rattlesnake Mts., May 7, 1902, *Cotton* 563.

4a. *D. nemorosa* L., var. *leiocarpa* Lindbl., *Linnaea* 13: 33, 1839.

D. lutea Gilib., *Fl. Lith.* 2: 46, 1781.

Differing from the species only by having glabrous pods.

DISTRIBUTION: Humid Transition. TYPE: Dalekarliae Suec. (*Wahlenberg et Hartman*).

ISLAND COUNTY: Sandy bluffs, Whidby Island, April 17, 1897, *Gardner* 25.

KLICKITAT OF YAKIMA COUNTY: Klickitat River, June 22, 1899, *Flett* 1142 in part.

5. *D. stenoloba* Ledeb., *Fl. Ross.* 1: 154, 1841.

D. deflexa Greene, *Pittonia* 4: 20, 1899.

D. nitida Greene, *Pl. Baker.* 3: 7, 1901.

Annual, usually distinctly rosulate at base; roots fibrous, branching from a distinct taproot; basal leaves on all well developed plants forming a distinct rosulate tuft, the first leaves and those on small plants obovate,

the later ones on large plants oblanceolate to linear-oblanceolate with a marked petiolar base, ciliate with simple hispidulous hairs, pubescent beneath with mostly branched hairs, sparsely hispid or branched pubescent above and often glabrate; cauline leaves one to several sessile elliptic or ovate lanceolate, entire or few toothed, sparsely pilose above and branched pubescent beneath; stems one, or with several secondary ones, simple or with weak axillary branches, hispidulous and forked pubescent below and glabrous above, slender, 4-35 cm. tall, the inflorescence often exceeding the leafy portion of the stem; inflorescence becoming loosely racemose, 3-40-flowered glabrous; pedicels stiff, slightly ascending, exceeded by, or all but the lower exceeded by the pods; flowering tip of the raceme small compact and cymose; sepals elliptic obovate, sparsely white pilose or branched pubescent on the back, 1-3 mm. long; petals oblanceolate emarginate narrowed to a slender claw, pale yellow or tipped with violet, fading to white, 2-4 mm. long; stamens 6, the anthers cordate 0.2 mm. long, the filaments subulate 2 mm. long; nectar glands lateral small and conical; pods flat compressed linear or somewhat arcuate glabrous, 10-15 mm. long, 1-2 mm. wide; style wanting.

DISTRIBUTION: Hudsonian. TYPE: In ins. Unalashka! (Chamiss., Eschsch.).

WASHINGTON: Cascade Mts., 1882, *Tweedy* 163.

CHELAN COUNTY: Stevens Pass, 3950 ft., Cascade Mts., August 16, 1893, *Sandberg & Leiberg* 758.

CLALLAM COUNTY: Olympic Mts., July 21, 1897, *Flett* 102. This is probably from Clallam Co., though not definitely so stated.

COLUMBIA COUNTY: Dry open places, Oregon Butte, T. 7 N., R. 41 E., July 23, 1913, *Darlington* 349.

KITTITAS COUNTY: Common on wet banks of streams, which flow through dense woods, Wenatchee Mts., July 1897, *Elmer* 434; somewhat shady places, 5300 ft., Wenatchee Mts., July 1, 1903, *Cotton* 1288.

PEND OREILLE COUNTY: Gravelly upper slopes of Round Top Mt., June 19, 1924, *St. John* 6417.

YAKIMA COUNTY: Subalpine meadow, 6000 ft., Nile Creek, Bald Mt., July 22, 1923, *St. John* 7816.

WHATCOM COUNTY: Grassy slopes among loose stones, 6000 ft., Mt. Baker Mining Dist., July 4, 1898, *Flett* 851; dry hillslope, Twin Lakes, September 4, 1927, *Hardin* 325.

It will be seen from the synonymy that the name *D. stenoloba* Ledeb. is being maintained in the sense of Gray and of Piper for this yellow-flowered annual. Recently several authors have adopted other names for this species in the United States, indicating that Gray and Piper had misapplied Ledebour's name. Dr. E. L. Greene seems to have started this when he described *D. nitida* from specimens collected in the mountains of Colorado. He wrote, "The plant is one which has been referred erroneously to *D. stenoloba*." This characteristic categorical statement of Dr. Greene's does not give any contrasting characters to separate his new species from *D. stenoloba*, or any explanation as to the true nature of *D. stenoloba*. There is a duplicate type of *D. nitida* Greene, *Baker* 492, in

the Herbarium of the State College of Washington, and a duplicate type of *D. stenoloba* Ledeb., including both the *Chamisso* and *Eschscholtz* plants from Unalashka, in the Gray Herbarium. It has been possible with the original descriptions in hand to compare these authentic specimens. No hint of a difference in any part of the plants could be discovered.

Draba deflexa was described by Dr. Greene from a collection made at Camp Stambaugh, Wyoming, by Dr. Maghee in 1878. This consists of a single plant. It has a compact rosulate tuft of leaves, and a strong central stem. This is stouter than in the specimens of *D. stenoloba* and the lower pedicels are conspicuously slender and deflexed. Even the first glance will reveal that this stem terminates in a heavy clavate fasciate expansion. The several secondary stems arising from the base and from the axils are a little slender, but otherwise normal. They are identical with stems of *D. stenoloba* and quite unlike the heavy stem with deflexed pedicels, which they surround. It is obvious, we believe, that this specimen is a monstrosity. Annotations on the type sheet indicate that Dr. E. Gilg held the same opinion. A species based on a monstrosity is invalid, as indicated by Article 51, 3, of the International Rules.

Since the above was written, Schulz's treatment of the genus in the *Pflanzenreich* has come to hand. He maintains all three of the species here discussed. For *D. deflexa* Greene, there seems to the writers to be no possible supporting evidence. Even if the specimens from British Columbia to Colorado could be separated as a species, they could not be called *D. deflexa*, as that was based on a single specimen, a monstrosity, and the specific name and the distinctive characters in the original description all related to this abnormal structure. As has been stated, such cases are specifically outlawed by rule. Nor can the present writers detect a second species from that area.

D. stenoloba Ledeb. is maintained by Schulz only for the original collections by Chamisso and Eschscholtz from Unalashka. The remaining large number of collections from the mainland are put into *D. nitida* Greene, and two varieties of this are made, var. *nana* for those with the shortest pods, and var. *praelonga* for those with the longest pods. These varieties seem to the writers to be merely the extremes of the normal variation, to lack any correlated characters or any natural and distinct range. No reason is seen for their maintenance.

The question of a distinction between *D. stenoloba* and *D. nitida* is not so easily disposed of. For key characters the former has: Stems ascending 1-3-leaved; petals 4-4.5 mm. long; ovary with 16-20 ovules; while the latter has stems erect, 0-7-leaved; petals 1.5-4 mm. long; and the ovary with 24-44 ovules. These characters can be tested against the duplicate type of *D. stenoloba*, the duplicate type of *D. nitida*, as well as numerous collections of the latter from the western United States and Canada. Both have the first and central stem erect, and any later lateral branches ascending, so this character is not helpful. The number of cauline leaves is not contrasting even as stated by Schulz. To be sure *D. stenoloba* is said not to have more than 3. If more collections of this were available, it is probable that this maximum would be surpassed. The petals of the

northern *D. stenoloba* do seem to average larger than in the collections from further south. This also fails to hold as a sure distinction, for the writers have measured one of the other group running from 2 up to 4.2 mm. in length. *D. stenoloba* is said to have the ovary with 16-20 ovules, while *D. nitida* has from 22-44. The duplicate type of *D. nitida* shows 24 ovules, but Sandberg & Leiberg 758 shows 19-26; *St. John* 7816 shows 18-24; *St. John* 6417 shows 18-27; and Flett 102 shows 10-19. Hence there is no usable distinction in the number of the seeds or ovules. The actual number seems to depend on the length of the pod, that in turn on the vigor of the plant, and that probably upon the climatic conditions and the edaphic conditions of the spot where the seed of the annual happened to fall.

In the descriptions of these two species, Schulz gives additional contrasting characters. *D. stenoloba* is said to be a perennial, with the sepals 2.5-3 mm. long, the petals white?, and the stamens 2.5-3 mm. long. *D. nitida* is said to be an annual, very rarely perennial, with the sepals 1-1.5 mm. long, the petals yellow, at length violet, and the stamens 1-1.2 mm. long. These together with the key characters make quite a formidable list. However, after a careful study of a series of specimens, these too disappear. The original specimens of the Chamisso and Eschscholtz collection seen, five plants, seem clearly to be annuals and not perennials. Of course under special conditions any annual may live over to the second season, but all of the plants in this group seem characteristic annuals. The sepals of this series vary in length all the way from 1 to 2.5 mm. All old or poorly dried specimens of this group seem to have white flowers. The stamen length also falls down as a character, examples having been measured all the way from 1 to 3 mm.

A second detailed comparison of this group has failed to show any reason for maintaining *D. deflexa* Greene or *D. nitida* Greene.

6. *D. aureola* Wats., Bot. Calif. 2: 430, 1880.

Biennial, or according to Watson sometimes of longer duration, though no evidence to support this has been seen by the writers; roots white, long and slender, unbranched above, with fibrous lateral rootlets below; stems of the first year's growth becoming deeply buried by the loose sliding volcanic soil; stems of the second year simple or somewhat branched, 4-10 cm. high, densely leafy even up into the inflorescence, densely white hispidulous with simple and a few forked hairs; leaves often reflexed below and ascending above, so numerous and massed as to appear imbricate, narrowly spatulate, densely white forked pubescent throughout and long white ciliate, thick and fleshy with the veins scarcely visible, 5-25 mm. long, 1.5-4.5 mm. wide; racemes simple or compound, but always with a strong central one, 30-50-flowered hispidulous with white mostly forked hairs; pedicels ascending, forked or simple hispidulous, 4-8 mm. long; sepals yellowish, smooth or sparsely hispidulous; petals bright yellow and drying yellow, 4-5 mm. long, spatulate emarginate or obtuse; stamens 6 3.5-5.5 mm. long, the anthers elliptic-oblong 1 mm. long, the filaments

subulate; nectar glands lateral minute conical; pods flattened oblong-lanceolate or elliptic, densely short white forked hispidulous, 10–14 mm. long, 4–5 mm. wide, beaked with a prominent style 1–2 mm. long.

DISTRIBUTION: Arctic-Alpine. It is apparently confined to fine loose volcanic soils at high elevations on Lassen Peak, Calif., Diamond Peak and the Three Sisters, Ore., and Mt. Rainier, Wash. TYPE: Sierra Nevada, in Sierra County (*Lemmon*), and on Lassen's Peak, *Mrs. Austin*.

PIERCE COUNTY: Alt. 10,000 ft., Mt. Rainier, August, 1889, *Piper & Smith* 699 (*Gray Herb.*); in volcanic sand, 10,000 ft. alt., Mt. Rainier, August, 1895, *Piper* 2061; in rock talus, 10,000 ft. alt., Mt. Rainier, August, 1897, *Flett* 286; Ruth Mt., 8,700 ft. alt., August 21, 1919, *Flett* 3168; dry volcanic soil, Camp Muir, 10,000 ft., Mt. Rainier, August 14, 1927, *Warren* 574.

7. *D. cascadenis* sp. nov.

Perennial with a stout tap-root and numerous strong laterals; crown branching and multicapital, bearing numerous short stems that elongate each year up to the ground surface; basal leaves forming a rosette, oblanceolate narrowed to a slender petiole, remotely dentate, soft white stellate pubescent throughout, 1–2 cm. long; cauline leaves 2–6, remote, lanceolate to ovate-lanceolate remotely dentate, soft white stellate pubescent throughout and with a few hispid cilia near the base, sessile, 7–15 mm. long, 3–5 mm. wide; stems simple or branching, soft white stellate pubescent throughout and white hispid especially below, 5–10 cm. tall at anthesis, 15–18 cm. tall at maturity, stems all erect, and in old plants with many stems making a compact bushy growth; inflorescence at anthesis appearing subcapitate, soon elongating into a loose raceme 2–9 cm. long; pedicels white stellate ascending, 3–5 mm. long; lowest flower leafy bracted; sepals ovate to ovate-oblong, densely white pilose, 1.5 mm. long; petals pale yellow, oblanceolate emarginate notched, 3.5 mm. long; stamens 6, 1.5–2.5 mm. long, the anthers cordate apiculate, 0.2 mm. long, the filaments linear; nectar glands conical, lateral, i. e. on either side of the base of the two short filaments; pods linear-oblong, tapering to either end, puberulent with white stellate and simple hairs, flat and compressed, 8–12 mm. long, 1.7–2 mm. broad; style 0.1 mm. long.

Perennis, caulibus foliosis, foliis utrinque pube stellata obtectis, petalis flavis 3.5 mm. longis, siliculis stellatis compressis lineari-oblongis 8–12 mm. longis, stylo 0.1 mm. longo.

DISTRIBUTION: Hudsonian. TYPE: *St. John* 6580, Glacier Peak.

SNOHOMISH COUNTY: Alpine meadows, 6,500 feet alt., gneiss ridges on northwest slope of Glacier Peak, July 24, 1924, *Harold St. John* 6580 (type in Herb. State College of Washington).

The new *D. cascadenis* is a member of the Section *Phyllodraba* as treated in O. E. Schulz's monograph in the *Pflanzenreich*. It is most closely related to *D. aureiformis* Rydb., or *D. aurea* Vahl, var. *aureiformis* (Rydb.) O. E. Schulz as it is called in the monograph. The best distinctions seem to be the facts that *D. aureiformis* Rydb. has the style 0.5–1 mm. long; the

Pods linear-oblong-lanceolate, 2.5–3 mm. broad; the basal leaves entire; and the cauline leaves 6–18 in number. On the other hand, *D. cascadenis* Payson & St. John has the style 0.1 mm. long; the pods linear-oblong tapering to each end, 1.7–2 mm. broad; the basal leaves dentate; and the cauline leaves 2–6 in number.

The specific name has been taken from the name of the Cascade Mountains, from the fact that the plant has been found only on one of the high peaks of that mountain range.

While studying this plant, a variation of its closest relative has been discovered. This may be described as:

***D. aureiformis* Rydb., var. *leiocarpa* var. nov.**

Siliculis glabris. Differing from the species only in having the pods glabrous.

COLORADO: Farnham, Park Co., July 11, 1891, *E. C. Smith* (type in Herb. State College of Washington.)

8. ***D. lonchocarpa* Rydb., Mem. N. Y. Bot. Gard. 1: 181, 1900.**

D. nivalis Liljeb., var. *elongata* Wats., Proc. Am. Acad. 23: 258, 1888.

Perennial tufted and caespitose; roots slender and whitish, tap-root long and slender, lateral ones delicate; in old plants the crown branches into several short stems, each crowned with a dense rosulate mass of leaves, and these massed into a tuft; basal leaves obovate to oblanceolate or oblong-oblanceolate, tapering to a broadly winged petiole, closely imbricate, hoary with long white stellate pubescence on all parts readily visible, but ciliate near the base with long white hispid hairs, and with simple white pilose hairs on the middle and basal portions of the upper surface, 4–7 mm. long, 2–3 mm. broad; cauline leaves wanting on all specimens examined though occasionally present (fide Schulz); stems scapose, glabrous or with a few stellate hairs near the base, slender, 2–9 cm. tall; inflorescence glabrous, becoming a loose raceme, 2–8-flowered; pedicels slender glabrous, strongly ascending, 2–7 mm. long; sepals elliptic, white pilose near the tip, 2–2.5 mm. long; petals with an obovate blade, slightly or definitely emarginate, white, the claw tapering and slender, slightly shorter than the blade, petals 3.5–4 mm. long; stamens 6, 2–3 mm. long, the anther broadly ellipsoid 0.3 mm. long, the filament linear; nectar glands lateral and conical; pods linear compressed, usually twisted glabrous, 10–15 mm. long, 1 mm. broad; style 0.2–0.3 mm. long; stigma flat.

DISTRIBUTION: Hudsonian. TYPE: Rocky Mountains, from British America to Washington, Wyoming and the Uintas.

PEND OREILLE COUNTY: Crevices of limestone cliffs, Z-Canyon, June 23, 1924, *St. John* 6468.

PIERCE COUNTY: Owyhigh, 5,800 ft. alt., Mt. Rainier, August 9, 1919, *Flett*.

SKAMANIA COUNTY: Chiquash Mts., at 6,000 or 7,000 ft. alt., August 26, 1895, *Suksdorf* 2541.

WHATCOM COUNTY: Mt. Baker Mining Dist., alt. 6,000 ft., July 20, 1898, *Flett* 856.

All of the specimens studied have naked scapes. Such plants will not run down in Schulz's key in his monograph in the Pflanzenreich. He puts *D. lonchocarpa* under the heading, "Caules floriferi±foliosi." To be sure, in his description of the Section *Leucodraba* and the Subsection *Evulecodraba*, allowance is made for occasional leafless stems, but there is no such provision in the key. In the Pacific Northwest this leafless condition seems to be constant, not a mere rare variation.

8a. *D. lonchocarpa* Rydb., var. *semitonsa* var. nov.

Differing from the species by having the pods short puberulent on the margins, and the petals drying yellowish.

Siliculis ad marginem puberulis, petalis flavescentibus.

DISTRIBUTION: Arctic-Alpine. TYPE: *Piper* 2060.

PIERCE COUNTY: In volcanic sand, 9,000 ft. alt., Mt. Rainier, August, 1895, *Piper* 2060 (type in Herb. State College of Washington); dry rocky soil, 8,500 ft., Mt. Rainier, June 25, 1926, *Warren* 512; rocky cliff, Indian Henry's, Crystal Mt., Mt. Rainier, July 2, 1928, *Warren* 753; rocky ledges near top, Iron Mt., Mt. Rainier, June 17, 1928, *Warren* 864.

The *Piper* specimen was studied and commented on by Schulz in his monograph (l. c. 215). He stated that it approached var. *dasycarpa* through its fruits which were sparsely pilose on the margins. The fact that it has again been collected on the same mountain, and that it occurs at higher elevations, seems to entitle it to varietal rank. The var. *dasycarpa* which has the siliques densely pubescent with simple, forked and stellate hairs, is known only from Laggan in the Canadian Rockies.

8b. *D. lonchocarpa* Rydb., var. *vestita* O. E. Schulz, Pflanzenreich IV, fam. 105: 216, 1927.

Differs from the species by having its stem and pedicels densely stellate pubescent.

DISTRIBUTION: Arctic-Alpine. TYPE: Alaska und Kanada, i. e., Virgin Bay, *Trelease & Saunders* 3913; Mt. Arrowsmith, *Macoun* 1929.

WHATCOM COUNTY: Alpine slate ledges, 6,700 ft., Grouse Ridge, Mt. Baker, August 8, 1923, *St. John* 5123.

The majority of the specimens in this collection have from 1-2 cauline leaves on the scapes. These are small, ovate dentate and sessile, 2-6 mm. long.

9. *D. novolympica* sp. nov.

Perennial, the root unknown; densely caespitose from the numerous short dichotomous branches at the surface of the ground, these slender cylindrical from the persisting mass of old leaves, 2-3 cm. long; leaves narrowly linear-oblancoate to almost linear, entire thick and coriaceous, the single nerves somewhat prominent beneath, prominently white ciliate throughout with hispid simple or forked hairs 0.7-0.9 mm. long, pubescent beneath with loose white forked or some stellate hairs, less so above, 4-5 mm. long, 0.5-0.8 mm. wide, ascending and the tips incurved; scapes slender, white

hispid with mostly forked hairs, 1-10 mm. tall; inflorescence short and subcymose even in fruit, hispid with white mostly forked hairs, 3-8-flowered; pedicels ascending, white hispid with mostly forked hairs; sepals unequal, yellowish and hyaline margined, hispid with mostly forked hairs, obovate to oblong, 2.5 mm. long, 1.5 mm. wide; petals yellow, oblanceolate, narrowed to a short claw just above the broader base, obtuse and entire, 3-3.5 mm. long, 1.5 mm. wide; stamens 6, 2-2.5 mm. long, the anthers oblong-lanceolate, cordate at base, 0.5 mm. long, the filaments subulate with a deltoid base; the nectar glands lateral pyramidal and prominent, connected by a low continuous ridge into a hippocrepiform structure; pods flat compressed, rough hispid with short stiff forked hairs, acute and ovate-lanceolate but distinctly lop-sided, 2-6-ovuled, 2-5 mm. long, 1.2-2.7 mm. broad; style stout, 0.1-0.3 mm. long, the stigma discoid and prominent; seeds (immature) brown wingless, 1.4 mm. long.

Perennis caespitosa, foliis anguste lineari-oblanceolatis integris coriaceis ciliatis utrinque pilis furcatis hispidis, scapis gracilibus 1-10 mm. altis, petalis luteis oblanceolatis 3-3.5 mm. longis, siliculis compressis ovato-lanceolatis 2-5 mm. longis, stylo 0.1-0.3 mm. longo.

DISTRIBUTION: Arctic-Alpine. TYPE: *Flett* 844.

OLYMPIC MOUNTAINS: Rocky summits, shale, etc., alt. 6,000 ft., August 28, 1898, *J. B. Flett* 844 (type in Herb. State College of Washington).

YAKIMA REGION: In 1882, *T. S. Brandegee* 373 in part (Herb. Univ. Calif.).

The new *D. novolympica* is a member of the Section *Chrysodraba* according to the classification in O. E. Schulz's monograph in the Pflanzenreich. It most closely resembles a species of Greenland, Spitzbergen, and arctic Eurasia, *D. pauciflora* R. Br., var. *hebecarpa* (Pohle & N. Busch) O. E. Schulz. This arctic plant may be recognized by its leaves oblong-elliptic 5-7 mm. long, ciliate with simple hairs; the scape 5-50 mm. tall, hirsute with simple hairs 0.75 mm. long and with shorter forked hairs; the sepals 1.2-2 mm. long, hirsute; the petals 1.5-2.5 mm. long; the stamens 1.2-2 mm. long; and the ovules 12-16. *D. novolympica* Payson & St. John may be distinguished by its leaves narrowly linear-oblanceolate, 4-5 mm. long, ciliate with simple and forked hairs; the scape 1-10 mm. tall, hispid with mostly forked hairs 0.5 mm. long; the sepals 2.5 mm. long, hispid with mostly forked hairs; the petals 3-3.5 mm. long; the stamens 2-2.5 mm. long; and the ovules 2-6.

The specific name is coined from the name of the mountains where the type collection was made. The type sheet contains but one fruiting tuft. The Brandegee collection contains two plants in flower and fruit. Hence, the description of the floral parts was taken from this cotype material. As far as the plants are concerned this collection would have made a better type specimen than the one so designated. Unfortunately this *Brandegee* 373 contains a mixture of several species, presumably of several different collections. The sheet of it from the Brandegee Herbarium, now in the Herbarium of the University of California includes two plants of the new *D. novolympica*, one plant of *D. Nelsonii* Macbr. & Payson, and five plants of *D. incerta* Payson, var. *laevicapsula* (Payson) Payson & St. John. The

sheet of it in the Rocky Mountain Herbarium contains specimens of *D. Nelsonii* and of *D. Paysonii* Macbr. It is obvious that nothing but confusion would result from designating as the type a numbered collection that includes such a heterogeneous mixture as does this one.

10. *D. Douglasii* Gray, Proc. Am. Acad. Arts Sci. 7: 328, 1868.

Cusickia Douglasii Gray in synonym., Proc. Am. Acad. Arts Sci. 17: 199, 1882; O. E. Schulz, Pflanzenreich IV, fam. 105: 12, 341, 1927; not *Cusickia* of M. E. Jones.

Braya oregonensis Gray, Proc. Am. Acad. Arts Sci. 17: 199, 1882.

Perennial; stems stout and woody, freely branching at or near the surface, more or less clothed with marcescent leaf-bases; leaves pale green, thick and rigid, ciliate with weak simple hairs, glabrous above, weakly more or less appressed pilose beneath, 1-ribbed, the lower oblanceolate, the upper oblanceolate-linear to nearly linear, 3-10 mm. long, 0.5-2 mm. broad; aerial stems short subequal, giving a low tufted appearance to the plant, densely leafy at the tips and clothed with partially decayed leaf bases below; the naked subscapose stem tips very short, exceeded by the leaves, or slightly exceeding them, sparsely white pilose with somewhat matted simple hairs; inflorescence 5-8-flowered small, compact at anthesis, only slightly elongating in fruit, white pilose, the pedicels 1-7 mm. long; flowers 4-5 mm. long; sepals elliptic concave green glabrous, 3 mm. long; petals white oblanceolate-spatulate clawed, 4-5 mm. long, 1 mm. broad; stamens 6, 3-4 mm. long, the anthers oblong, 0.6 mm. long, the filaments subulate; nectar glands lateral closed 6-angled hollowed, these joined with the median ones; pods subovoid scarcely flattened, rigid and coriaceous, white appressed puberulent, 4-5 mm. long, 2-2.5 mm. broad, tipped with a rigid style 1-2 mm. long; ovules 2-4 in each cell pendent, seeds 1-2 in a cell, large smooth and shining nearly filling the cavity.

DISTRIBUTION: Upper Sonoran. TYPE: Douglas's collection in the interior of Oregon or California.

KLICKITAT COUNTY: Klickitat hills, May, 1895, *Howell* 50.

The fact that Dr. Gray named this species under three different genera of *Cruciferae* is a good indication of its anomalous character. The name *Cusickia* appeared only in synonymy. It was chosen and then communicated to W. C. Cusick, who had made a collection of the plant. Cusick distributed a number of specimens under this name. By the time he was ready to publish, Dr. Gray changed his mind, and called the plant *Braya oregonensis*, citing the name *Cusickia* in synonymy to indicate that he had abandoned the idea of describing it as a separate genus. It appears that he had already described the plant from a different part of its range as *Draba Douglasii*, and overlooked this fact when it was sent to him the second time.

When completing volume one, part one, of Gray's Synoptical Flora, Dr. B. L. Robinson discovered that Dr. Gray had described the plant under the two different genera. It seemed to belong in the genus *Draba*, so the earlier name was adopted in that work.

O. E. Schulz in his recent monograph of *Draba* lists *D. Douglasii* in the Species excludendae. He refers it to *Cusickia Douglasii* Gray, though Gray published this name only in synonymy. On page 12 Schulz lists the characters that separate *Cusickia* from *Draba*. These are, when translated, the following: (1) small boat-shaped sepals; (2) petals rounded at the tip; (3) closed lateral six-angled nectaries, which are joined with the median ones; (4) valves of the pod hard; (5) seeds smooth shining few and large, filling the aperture of the cells. When these characters are compared with those of the genus *Draba*, either including or excluding *Erophila*, it will be obvious that nos. 1 and 2 are of no diagnostic value. The subovoid hard pods are somewhat aberrant for *Draba* and suggestive of *Camelina*, but Schulz retains in *Draba* a number of species with inflated pods, as *D. sphaerocarpa* Macbr. & Payson. The rigidity of texture of the valves is a relative matter, and does not seem to the writers to be of generic value. Of the characters listed under (5), only the large size of the seeds seems worth discussing. When seeds are of the same nature, of the same manner of attachment, the mere fact that they grow larger in proportion in one species, would not seem to necessitate making that species a genus. Item no. (3) seems most important. The characters provided by the nectaries situated on either side of the base of the filaments have not been generally used in these genera, but they may well be of fundamental taxonomic value. On page 6 Schulz describes the nectaries as they occur in *Draba*, as restricted by him. They are lateral or median or both and fused into a ring, as well as many other forms. If all these types of nectaries are to be allowed in *Draba*, there seems no good reason for setting aside the one type described above. The genus *Draba* seems to the writers the best and most logical place for this species.

In any case the generic name *Cusickia* can not be used for this group, since it became a homonym before it was adequately described. In 1908 M. E. Jones¹ used the same name *Cusickia* for a genus of the Umbelliferae, which he published with a detailed description. It included the single species *C. minor* Jones. Hence the generic name *Cusickia* of Gray can not now be revived and legalized by the addition of a description.

11. *D. Nelsonii* Macbride and Payson, Am. Journ. Bot. 4: 259, 1917.

D. densifolia Nutt., f. *Nelsonii* (Macbr. & Pays.) O. E. Schulz, Pflanzenreich IV, fam. 105: 103, 1927.

Caespitose tufted perennial; root a strong dark vertical tap-root, not branching near the surface; crown multicapital at the surface, producing many short slender stems, these scaly below with the marcescent fragments of old leaves, and crowned with a cylindrical mass of erect or incurved rigid leaves; leaves all basal, linear thick acute cuspidate, the midrib prominent beneath, strongly ciliate with remote white stiff hispid hairs, otherwise glabrous, 5-7 mm. long, less than 1 mm. wide; scapes slender erect, sparsely pubescent below with simple or forked hispidulous hairs or glabrous, 1-4 cm. tall; inflorescence 4-9-flowered, in fruit forming a short

¹Contrib. W. Bot. 12:39-40. 1908.

compact raceme, pedicels glabrous ascending, 2–5 mm. long; sepals greenish ovate-elliptic sparsely pilose with simple or forked hairs on the back or usually glabrous, 3–3.5 mm. long; petals yellow obovate, slightly cuneate at base, obtuse, 4–5 mm. long; stamens 6, 2–2.5 mm. long, the anthers elliptic to subcordate 0.3 mm. long, the filaments subulate; nectar glands large, the lateral ones deltoid, connected by the median ones to form two hippocrepiform ridges; pods flat and compressed, broadly and asymmetrically lanceolate, white puberulent with simple and forked hairs, 3–6 mm. long, 2–3 mm. broad; style 0.6–1 mm. long.

DISTRIBUTION: Hudsonian. TYPE: Idaho: Exposed alpine summit, Antelope Mts., near Martin, Blaine Co., July 6, 1916, *Macbride & Payson* 3077.

WASHINGTON: Cascade Mts., 1882, *Brandege* 373 in part.

YAKIMA COUNTY: Scab rock, summit of Bald Mt., 6,100 ft. alt., head of branch of Nile Creek, July 22, 1923, *St. John* 7851.

O. E. Schulz has reduced¹ this species to a forma under *D. densifolia* Nutt. He follows *Macbride*² in making *D. Mulfordae* Payson a synonym of *D. densifolia* Nutt. *D. densifolia*, however, has as conspicuous characters, stellate hairs on the leaves and the style 1.5–2 mm. long. Because of these and other characters, the writers are unable to concur with Schulz's reduction of *D. Nelsonii* to the rank of a forma.

Schulz assigns *D. Nelsonii* to a place in the Section *Chrysodraba*. This section is defined so that the present species is adequately included, as well as many other species of very diverse habit and character. The key, on the other hand, does not make the same impression. The choice comes between: "Folia rigida, angusta. Funiculi elongati.

Folia mollia, latiora, rarissime rigidula."

One would scarcely seek for a plant with linear rigid leaves under the second division.

12. *D. ruaxes* sp. nov.

Perennial, the subterranean branches freely branching and forming a caespitose tuft at the surface; lateral roots slender and fibrous, the principal roots deeply buried and not known; stems of each year's growth quickly buried by the loose sliding volcanic rocks, the leaf bases marcescent and long persistent, each stem bearing at the surface a small compact rosette of leaves; leaves all basal, oblanceolate to suborbicular sessile or subsessile densely white pilose with simple and forked hairs, hispid ciliate towards the base, thick and firm in texture, 3–7 mm. long, 2–4 mm. wide; aerial stems scapose slender, pilose with mostly simple hairs, 1–5 cm. tall; inflorescence small, but compact and subcapitate even in fruit, 3–6-flowered; pedicels very short at anthesis, but becoming 3–4 mm. long, ascending, loosely white pilose; flowers 3–4 mm. long; sepals ovate or ovate-lanceolate, scarious margined, white pilose with simple hairs, 2.5–3 mm. long; petals bright yellow, blade suborbicular broadly emarginate 3.5 mm. broad

¹L. c. 103.

²Contrib. Gray Herb. n. s. 56: 52–53, 1918.

narrowed to a short claw; stamens 6, 3.5-4 mm. long, the anthers elliptic to oblong 0.4 mm. long, the filaments linear; nectar glands lateral large and triangular; pods ovate elliptic flattened, hispidulous with white simple hairs, 5-8 mm. long, 3-4 mm. broad, ovules about 18; style 0.7 mm. long.

Perennis scaposa, foliis omnibus radicalibus oblanceolatis vel suborbicularibus pilosis, scapis pilosis 1-5 cm. altis, floribus subcapitatis luteis, siliculis ovato ellipticis hispidulis, stylo 0.7 mm. longo.

DISTRIBUTION: Arctic Alpine. TYPE: *St. John* 6590.

SNOHOMISH COUNTY: Crevices of disintegrating flaky andesite, 8,000 ft. alt., north side of Glacier Peak, Washington, July 24, 1924, *Harold St. John* 6590 (type in Herb. State College of Washington).

BRITISH COLUMBIA: Cliffs of Mt. Chris Spencer, 9,000 ft. alt., Coast Range Mts., lat. 51 degrees, July 7, 1928, *Mrs. Don Munday* 88 (Hb. Prov. Mus. B. C.); on cliffs, Fury Gap, 8,500 ft., July 6, 1928, *Munday* 21 (I) (Hb. Prov. Mus. B. C.).

The collector has a vivid recollection of the locality where this plant was found. He led an expedition in to explore the unknown north side of this beautiful snow-capped volcano. From the main camp on the Whitechuck River, two days of arduous back-packing established a high camp at 5500 feet in the open alpine meadows near the head of Fire Creek. On July 24th the attempt was made with Dr. J. R. Neller to climb Glacier Peak. The ascent was only 5000 feet and the distance not over five miles, and the route looked easy along a continuous ridge. Closer acquaintance with the area, however, revealed knife-edge ridges, cliffs, steeply sloping snow fields, and glaciers deeply cut by crevasses. Twelve hours of continuous climbing found the party still 500 feet from the summit, and the fear of darkness caused a retreat. At a spot near the 8,000 foot level, a series of cliffs caused the climbers to leave the ridge and skirt its side above the Kennedy Glacier. To reach the ridge again, it was necessary to climb up through a steep gully. Here the andesitic lava was shattered in a very peculiar way. It was broken into flat flakes about the size and shape of a person's hand. They were in a vertical position and stacked in loosely like cards. Each step started a landslide down the precipitous gully and threatened to take the climber with it. Between the loose flakes of this lava grew the perennial bright yellow *Draba* here described as new. The specific name is taken from the Greek *ῥῶαξ*, meaning a volcano.

The closest relative of this new species is *D. ventosa* Gray, described from *Parry* 15, collected at Snake Pass, Wyoming, in 1873. This may be distinguished by having its pods acute at apex, pubescent with slender stellate hairs; the sepals stellate pubescent; the scapes densely slender stellate; and the leaves densely slender white stellate or forked pubescent on both sides. On the other hand, *D. ruaxes* has the pods not acute at apex, short hispid; the sepals pilose with simple hairs; and the leaves pilose with simple and forked hairs. *D. Howellii* Wats. and *D. sobolifera* Rydb. have been treated as synonyms of *D. ventosa* Gray by Payson in his monograph.¹ Even if these variants should prove worthy of separation, they are easily distinguished from *D. ruaxes*. *D. Howellii* is sparingly stellate

¹Am. Journ. Bot. 4: 264, 1917.

throughout, with pedicels 6–11 mm. long, with petals 6–8 mm. long, and with the style 2 mm. long. *D. sobolifera* has the pedicels 7–8 mm. long, and the pods finely stellate. This new species may also be compared with *D. uncinatis* Rydb. but this has pods 3 mm. wide and 3–4 mm. long, and the basal leaves sparingly stellate.

D. ruaxes falls into the Section *Chrysodraba* of Schulz's treatment.

13. *D. caeruleomontana* sp. nov.

Caespitose perennial; tap root slender and vertical, the lateral roots deep seated; branches slender straw colored numerous ascending, leafy up to the rosette but not densely so and not appearing pulvinate; leaves all basal linear or very slightly spatulate rigid slightly divergent, the mid-rib prominent beneath, sparsely pubescent above and below with mostly stellate hispid hairs, ciliate throughout with remote rigid white hispid hairs 0.7–1 mm. long, acute and cuspidate, 0.8–1.8 cm. long, 1–1.5 mm. broad; scapes sparsely hispid below with simple and a few forked hairs, glabrate above, 5–16 cm. tall; inflorescence loose, markedly so at fruiting time, glabrate, 10–20 flowered; pedicels glabrous slender ascending, 3–25 mm. long; sepals oblong ovate yellowish green, hispid on the back with simple and forked hairs, the outer pair broader, 3–4 mm. long; petals yellow with a suborbicular shallowly emarginate blade, narrowed to a short broad claw, 4–5.5 mm. long, 3 mm. broad; stamens 6, 3–4 mm. long, the anthers broadly oblong to suborbicular 0.8–0.9 mm. long, the filaments subulate large and dilated below; nectar glands lateral large triangular and pyramidal; pods flat compressed glabrous, elliptic lanceolate to ovate lanceolate, many nerved, about 10–ovuled, 4–7 mm. long, 2–3 mm. broad; style 0.5–0.8 mm. long; seeds brown ovoid wingless, 1.3 mm. long.

Perennis, foliis rosulatis linearibus hispido-ciliatis sparse stellatis, 7–18 mm. longis 1–1.5 mm. latis, scapis sparse hispidis superne glabratibus 10–20-floris, petalis luteis suborbicularibus emarginatis 4–5.5 mm. longis, glandulis deltoideis magnis, siliculis compressis elliptico-lanceolatis 4–7 mm. longis, 2–3 mm. latis, stylo 0.5–0.8 mm. longo.

DISTRIBUTION: Hudsonian. TYPE: *Brode* 3.

COLUMBIA COUNTY: Bare basalt crevices, 6025 ft. alt., summit of Table Rock, T. 6 N., R. 39 E., September 23, 1928, *St. John, Moore, Smith & Van Amburg* 9652.

WALLA WALLA COUNTY: Rock crannies, 5,000 ft. alt., Lewis Peak, Blue Mts., May 27–29, 1923, *M. D. Brode* 3 (type in Herb. State College of Washington); in rock crevices, alt. 4,500 ft., Blue Mts., July, 1896, *Piper* 2404 in part.

D. caeruleomontana Payson & St. John is a member of the Section *Chrysodraba* according to the treatment by O. E. Schulz, though it will run there in his key only with difficulty and only after the elimination of the Section *Aizopsis*. In this monograph it would come next to *D. globosa* Payson, though it most closely resembles *D. laevicapsula* Payson. The latter species may be distinguished by having the leaves 7–10 mm. long, usually obtuse, not rigid, pubescence loosely stellate with weak marginal cilia near

the base; the inflorescence 2 cm. long in fruit. *D. caeruleomontana* has the leaves 8–18 mm. long, acute rigid, stellate hairs sparse and hispid, with strong hispid cilia throughout; the inflorescence 5–13 cm. long in fruit.

13a. *D. caeruleomontana* Payson and St. John, var. *Piperi* var. nov.

It differs from the species by having the pods densely white puberulent with simple and forked hairs.

A specie differt in siliculis puberulis.

DISTRIBUTION: Hudsonian. TYPE: *Piper* 2404 in part.

WALLA WALLA COUNTY: In rock crevices, alt. 4,500 ft., Blue Mts., July, 1896, C. V. *Piper* 2404 in part (type in Herb. State College of Washington.)

This new variety most closely resembles *D. densifolia* Nutt. (*D. Mulfordae* Payson), which can be recognized by having the leaves obtuse, not rigid, 5–10 mm. long, 1–2 mm. broad; the sepals 2.5–3 mm. long; and the style 1–2 mm. long. *D. caeruleomontana*, var. *Piperi* differs by having the leaves acute rigid, 8–18 mm. long, 1–1.5 mm. wide; the sepals 3–4 mm. long; and the style 0.5–0.8 mm. long.

14. *D. Paysonii* Macbr., Contrib. Gray Herb. n. s. 56: 52, 1918.

D. vestita Payson, Am. Journ. Bot. 4: 261, 1917, not Davidson.

D. densifolia Schulz in part, Pflanzenreich, IV, fam. 105: 103, 1927.

Densely caespitose perennial; crown multicapital, producing many short stems, these densely clothed with a cylindrical mass of marcescent leaves; leaves all basal, broadly linear to narrowly oblanceolate thin, not rigid, ascending appressed and imbricate, soft pubescent with long hairs, these simple branched or stellate, long ciliate with white hispid hairs, often glabrate above especially towards the base, 5–12 mm. long, 1–13 mm. broad; scapes erect long pilose with simple and forked hairs, 1–3 cm. tall; inflorescence short compact and corymbose even in fruit, 3–6 flowered; pedicels pilose with simple and forked hairs, 1–5 mm. long; sepals broadly elliptic densely pilose on the back with simple and forked hairs, 3–4 mm. long; petals yellow obovate slightly emarginate, narrowed to a short slender claw, 3–4 mm. long; stamens 6, 1.5–2.5 mm. long, the anthers oblong 0.5–0.7 mm. long, the filaments subulate and dilated at the point of attachment; nectar glands large, the lateral deltoid and pyramidal, connected by the median into a hippocrepiform shape; pods flat compressed lance-ovate, densely white pilose with mostly simple hairs, 5–8 mm. long, 2.5–4 mm. broad; style 0.5–1 mm. long; seeds 8–10, dark brown, 1 mm. long.

DISTRIBUTION: Hudsonian or Arctic-Alpine. TYPE: Upper Marias Pass, August 3, 1883, *Canby* 28.

WASHINGTON: Cascade Mts., 1882, *Brandege* 373 in part.

SKAMANIA COUNTY: At 6,000 or 7,000 ft. alt., Chiquash Mts., August 26, 1895, *Suksdorf* 2426. This specimen differs somewhat from the typical plants in having its leaves somewhat longer more rigid more divergent and the pubescence sparser. However, these points seem to be within

the normal range of variation and the specimen seems properly included within this species. It has been carefully compared with the type specimen.

O. E. Schulz lists *D. Paysonii* in the synonymy of *D. globosa* Payson, var. *sphaerula* (Macbride and Payson) Schulz. The various characters detailed in the above description will show why the writers do not concur with Schulz's treatment.

15. *D. incerta* Payson, Am. Journ. Bot. 4: 261, 1917.

D. oligosperma Hook., var. *vilosa* (Regel) Schulz, in part, Pflanzenreich IV, fam. 105: 101, 1927.

Perennial, caespitose and loosely tufted; tap-root slender and rather freely branching; caudex multicapital, producing numerous slender somewhat spreading short branches, these scaly from the marcescent petiole bases; leaves all basal, bright green, linear oblanceolate, not rigid, stellate with weak slender hairs throughout and ciliate towards the base with weak short pilose simple hairs, in age more or less glabrate on the upper surface towards the base, 7–10 mm. long, 2–4 mm. wide; scapes sparsely pilose with slender stellate hairs, 4–12 cm. tall; inflorescence 3–14-flowered, in fruit becoming a loose raceme; pedicels rather stout, ascending sparsely stellate and glabrate, 3–15 mm. long; sepals unequal elliptic ovate, sacate at base, yellowish, sparsely pilose on the back, 3 mm. long; petals yellow oblanceolate truncate, 5 mm. long; stamens 6, 2.5–3 mm. long, the anthers elliptic 0.5 mm. long; nectar glands lateral conical in shape; pods flat and compressed broadly lanceolate, white puberulent with stellate and mostly simple hairs, 4–8 mm. long, 2–3 mm. broad; style 0.5–0.9 mm. long; seeds about 20, neither winged nor margined.

DISTRIBUTION: Hudsonian. TYPE: Wyoming: among rocks on the summit, the Thunderer, Yellowstone Park, July 13, 1899, A. Nelson & E. Nelson 5818.

WASHINGTON: Cascade Mts., 1882, *Brandege* 371; Cascade Mts., *Lyll* in 1860.

CHELAN COUNTY: One tuft on mica schist ridge, Indian Head Peak, 7,000 ft. alt., Valley of the White River, July 31, 1921, *St. John* 4840.

YAKIMA COUNTY: Small volcano at base of Mt. Adams, July 12, 1899, *Flett* 1131.

The *Lyll* specimen cited above may or may not be the same as one of the three cited by O. E. Schulz under the *D. oligosperma* aggregate. The specimen in the Gray Herbarium gives no elevation, while that seen by Schulz in the Kew Herbarium had the elevation stated.

15a. *D. incerta* Payson, var. *laevicapsula* (Payson) comb. nov.

D. laevicapsula Payson, Am. Journ. Bot. 4: 262, 1917.

Further study has shown the close relationship of this plant to *D. incerta*. In fact, it seems to differ only by the lack of any pubescence on the capsules. It is somewhat less frequent, but occurs within the range of the species. As previously stated in the discussion of similar cases, one of the pair is considered a variety of the other.

DISTRIBUTION: Hudsonian. TYPE: Idaho: summit of Steven's Peak, Coer D'Alene Mts., August 5, 1895, *Leiberg* 1477 (Rocky Mt. Herb.).

YAKIMA REGION: In 1882, *Brandegee* 373 in part (Hb. U. Calif.).

DOUBTFUL RECORDS

Draba barbata Pohle, var. *Treleasii* (Gilg) O. E. Schulz, Pflanzenreich IV, fam. 105: 102, 1927. WASHINGTON: Yakima Region (Brandegee, 1882). This is undoubtedly one of the collections made on the Northern Transcontinental Survey, in connection with the Northern Pacific Railway. Search has been made for this in vain in the Herbarium of the New York State College of Pharmacy, and in the U. S. National Herbarium. Collections from this set were seen in the Rocky Mountain Herbarium and in the Herbarium of the University of California. Each contained two sheets, nos. 371 and 373. The former number included one species, and the latter four species, none of which answer to the description of *D. barbata*, var. *Treleasii*. While awaiting confirmation, this plant is listed among those doubtfully present in the State of Washington.

Draba oligosperma Hook., var. *andina* Nutt., f. *hirtiscapa* O. E. Schulz, Pflanzenreich IV, fam. 105: 100, 1927. OREGON: Ostseite der Cascade Mts., auf den Gipfeln, 49° n. Br., 2,500 m. ü. M. (Lyll, *Oreg. Bound. Commiss.* 1860). Many specimens of this plant have been examined from the Wallowa and the Rocky Mountains, including two of Lyll's, but none from the Cascade Mountains of Washington. No sheet of this could be found among the Lyll duplicates in the Gray Herbarium.

D. oligosperma Hook., var. *pilosa* (Regel) O. E. Schulz, Pflanzenreich IV, fam. 105: 101, 1927. OREGON: Ostseite der Cascade Mts. auf den Bergspitzen 49° n. Br., 2,500 m. ü. M. (Lyll, *Oreg. Bound. Commiss.* 1859, auch subvar. *leiocarpa*, hb. Kew). This record is difficult to interpret. Schulz does not publish, list, describe, or index any subvar. *leiocarpa* of *D. oligosperma*. The specimen cited above is listed under var. *pilosa*, but it, like the majority of other specimens, is indicated as subvar. *leiocarpa*. On page 99 there is a var. *leiocarpa* Schulz, but these same specimens are not listed under that variety. If the statement subvar. is to be interpreted as referring the reader to look under var. *leiocarpa*, at least the typographical error occurs eight times in the same paragraph. Also on page 100 Schulz refers several plants to var. *leiocarpa* without using the "sub". No specimen of this collection could be found in the Gray Herbarium, and the published record is too involved to be accepted without verification.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF FULVETTA FROM YUNNAN,
CHINA

BY J. H. RILEY.¹

Among the birds recently brought back by Doctor Joseph F. Rock, from exploring the high mountains of Yunnan and Szechwan under the auspices of the National Geographic Society, is an apparently unnamed specie of *Fulvetta*, a genus of small timaline birds inhabiting the high mountains of India and China. It may be known from the following description:

Fulvetta insperata, sp. nov.

Type.—Adult male, U. S. National Museum, No. 314,150, Nda-much'o, 14,000 feet, northwest Yunnan, October, 1929. Collected by Joseph F. Rock (original No. 1573).

Similar to *Fulvetta ruficapilla sordidior*, but pileum deep brownish drab, instead of light mars brown; no whitish around the eye; inner primaries and outer secondaries edged externally basally with buckthorn brown instead of sudan brown; rump and the base of the rectrices a much lighter brown; throat more heavily streaked with dusky; bill wholly black, instead of the base being lighter; feet considerably heavier.

Description.—Pileum deep brownish drab, bordered on each side above the superciliary line and commencing just over the eye, by a black line extending on to the upper back; the superciliary, lores, ear-coverts, and cheeks, light drab; throat pale drab-gray with rather broad dusky streaks; chest and breast, light drab; belly a little lighter than the breast; flanks and under tail-coverts, buckthorn brown; back, hair-brown; lower back scapulars and rump, buckthorn brown; tail, dark mouse gray, the outer feathers fringed externally basally with the color of the rump; wing-coverts deep mouse gray edged outwardly with the color of the rump; primaries and secondaries deep mouse gray, the four outer primaries edged outwardly with light olive-gray, the inner primaries, commencing with the seventh, and the secondaries edged externally basally with buckthorn brown; under wing-coverts and inner margins of the remiges basally, white; bill (in the

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skin) dull black; feet, blackish brown. Wing, 61; tail, 58; culmen, 9.5; tarsus, 24; middle-toe, 13 mm.

Remarks.—The U. S. National Museum contains eight specimens of *F. r. sordidior* and all of the specimens, that are unstained around the head, have a narrow white line above the eye and below it, but not meeting behind. *Fulvetta insperata* does not show a trace of an eye-ring. In *F. r. sordidior* the black line bordering the pileum on each side extends further forwards. Dr. Rock's men took both *F. r. sordidior* and the present bird at the same locality, otherwise I should have considered them only forms of the same species. This can hardly be *Fulvetta manipurensis* Grant from Manipur, though judging from the inadequate description of the original describer and that of Stuart Baker (*Fauna Br. Ind.*, Birds, ed. 2, vol. I, 1922, p. 292) it is apparently closely related. The latter compares it with *F. vinipecta*, however, while *F. insperata* resembles *F. ruficapilla* more closely. Only the type was secured.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONTWO NEW GENERIC NAMES AND THREE NEW
SPECIES OF MALLOPHAGA.

BY H. E. EWING.

Attention is here called to two generic names of Mallophaga that are preoccupied in other groups, and descriptions are here given of three new species. These new species are, for the most part, rather unusual in certain anatomical structures, and will be studied further later.

Uchida, new name.

The genus *Neumannia* Uchida was established in 1926 (Jour. Col. Agr. Imp. Univ. Tokyo, vol. IX, No. 1, p. 27) to include a number of species of Menoponidae. This name had already been used by Trouessart (1888) for a genus of Acarina. I suggest the name of *Uchida* to take its place, this name being given in honor of the author of the genus, a taxonomist who has done much to clear up the confusion of generic relationships in the Menoponidae.

Cummingsiella, new name.

Cummings established in 1916 (Proc. Zool. Soc. London, 1916, p. 675) the genus *Dollabella* for a species of Philopteridae, *D. testudinarius* (Denny), living on *Numenius*. Dr. E. A. Chapin has called the writer's attention to the fact that this name is preoccupied. It was used by Gistel in 1848 for a genus of mollusks. I suggest the name *Cummingsiella* to take its place.

Tetrophthalmus transitans, new species.

Head slightly broader than long; temples broadly rounded. Expansions of the head above antennal fossae each traversed by a deep gash for its entire width. Occipital setae, six, subequal, arranged in a transverse row. Antennae short; last segment a sphere with a short pedicel. Right mandible with two powerful hooks, left with but a single large hook, both with a few smaller teeth. Palpi extending beyond the margins of the head by the full length of the last two segments; last segment cylindrical, not swollen.

Thorax longer than head, broadest at its posterior margin and narrowest at the junction of the pro- with mesothorax. Prothorax almost as broad as the head and broadest at its anterior margin; each lateral apex with 3-4 spines; prosternite small, oval, about one and three-fourths times as long as wide, margins poorly sclerotized. The prosternite bears about two dozen subequal setae. Mesothorax separated from metathorax by a lateral notch and an incomplete dorsal suture. It is much smaller than the metathorax and is provided with a small and rather indistinct sternite which bears a patch of subequal setae. Metathorax with divided tergite, a row of dorsal setae along the posterior margin and a few lateral ones; metasternite large, shieldshape, lateral margins unthickened and studded with short setae.

Abdomen with all nine segments very distinct and none reduced. Spiracles very large, circular, subequal, each situated in tergite, approximate to lateral margin of same and each flanked on its inside by a large, circular pore. These accessory pores are as large as the spiracles of most biting lice. Each of the first four spiracles of a side is flanked postero-laterally by a seta, which is larger than the others near to it, and is probably sensory. Pleural plates small, triangular. Sternites well developed.

Genital armature of the type peculiar to the genus. Basal plate a long rod extending forward to middle of third abdominal segment; ejaculatory bulb very long, reaching to about the middle of fourth abdominal segment, its walls provided with spikelike chitinizations; parameres short, stout, but slightly curved; endomeres poorly developed.

Legs short, stout, with inflated femora; second pair slightly larger than first; third pair slightly larger than second; claws large, strongly curved, sharp.

Length of male, 4.70 mm.; width, 1.20 mm.

Type host and type locality.—Young cormorant, Chincha Island, Peru.

Type (holotype).—Cat. No. 42849, U. S. N. M.

Described from a single male in excellent condition, taken on the thigh of a young cormorant, in the stomach of a gull, Chincha Island, Peru, October 12, 1919 (Biological Survey stomach No. 156048). This species is especially interesting in showing the development of a sensory seta posterior to each spiracle. In the marsupial-infesting sub-family Boopinae these setae are long and flagelliform and constitute a characteristic feature of the group.

Colpocephalum ajajae, new species.

Head about as broad as long and with deep, angulate ocular emarginations. Clypeal region of head emarginate laterally above each palpus, and also in front at the median line. Labrum much reduced; anteclypeal region (ventral clypeal region) provided with a pair of conspicuous, quadrate plates. Postero-lateral margins of forehead each provided with a pair of subequal, straight spines. Lateral dorsal regions of head scaled about the ocular emarginations.

Thorax slightly longer than the head, and widest at its posterior margin. Pronotum with a straight transverse bar in front of the middle; with

lateral, spine-bearing lobes and a posterior row of ten, subequal marginal setae. Prosternite represented only by a small, incomplete chitinous ring. Mesothorax about one-half as big as metathorax and indistinctly separated from the latter by a slight constriction and incomplete dorsal groove. Metathorax equal in width with the first abdominal segment, bearing three spinelike setae at each lateral angle and a posterior marginal row of ten dorsal setae.

Abdomen long and slender, none of its nine complete segments reduced. Tergites undivided, not reduced; tergites I-VI completely fused with pleurites so as to form on each segment a single sclerite dorsally and laterally; tergites VII-VIII completely fused with both pleurites and sternites, thus forming an uninterrupted ring of chitin respectively around segments VII and VIII. Sternites I-VI free, not divided. Segment IX completely encased in a homogeneous flattened cone of chitinous integument. Dorsal setae arranged into two transverse rows on segments I-IV, into three irregular transverse rows on segment V; into 3-4 transverse rows on segments VI-VIII; central area of segment IX without setae.

Rodlike basal plate of male genital armature extending forward to about the middle of abdominal segment IV; parameres small, short, not extending beyond the tip of endomeral plate; dorsal chitinizations rather complicated.

Legs well developed; second pair the smallest; femora III each with 3-4 ventral combs of small spines. Claws strongly curved, sharp.

Length of male, 2.00 mm.; width, 0.62 mm.

Type host and type locality.—*Ajaja ajaja*, from Corpus Christi Pass, Texas.

Type (holotype).—Cat. No. 42850, U. S. N. M.

Described from a single male taken from the type host, at type locality, July 17, 1929, by Dr. Francis Harper. The presence of a pair of quadrate plates on the anteclypeus, which is ventral in position, presents a condition analogous to that found in *Ibidoecus* of the family Philopterae, where the signatural plate (dorsal in position) is divided.

***Colpocephalum scleroderma*, new species**

Head much broader than long, with large protruding temporal lobes. Labrum very small; anteclypeus (ventral part of clypeus) without plates; palpi extending beyond margin of head by full length of last segment; last seta in lateral marginal row of forehead, long, extending to about middle of temporal lobe, next to last short, somewhat spinelike.

Thorax about as long as head. Prothorax about two-thirds as broad as head and overlapped dorsally by the occipital region of the former; each lateral lobe of pronotum bearing an anterior spine and a posterior seta. Prosternite reduced to a tubercle. Mesothorax small, scarcely half as large as the metathorax, but separated from the latter by a complete dorsal suture; it bears but a single pair of small dorsal setae. Metathorax large, broader than first abdominal segment and with 3-4 spinelike setae at each lateral angle.

Abdomen short and broad, first segment largest, last segment completely surrounded on sides by lateral lobes of eighth segment. Tergites poorly

sclerotized and each bearing a transverse row of setae along the posterior border. Spiracles very small, subequal and situated in tergites near the lateral borders. Pleurites very thick, well sclerotized, and bearing long spinelike setae. Sternites III-V each bearing a single comb of 15-20 small, spinelike setae.

Rodlike basal plate of male genital armature extending forward to middle of first abdominal segment; parameres united and forming a broad parameral plate; dorsal chitinization simple, consisting of a broad plate which ends distally in a pair of stout, curved, lateral processes.

Legs stout; first pair smallest; femora and tibiae of all legs with greatly thickened outer margins; claws rather weak, strongly curved.

Length of male, 1.70 mm.; width, 0.75 mm.

Type host and type locality.—*Musophaga rossae* from Ituri Forest, Belgian Congo, Africa.

Type (holotype).—Cat. No. 42851, U. S. N. M.

A single male from type host and type locality, May 2, 1927. Received through Professor J. Bequaert (Dr. Strong No. 14). The very broad head and heavily sclerotized legs makes this species one of unusual appearance.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE SONORA RACES OF *CAMPTOSTOMA* AND
PLATYPSARIS.¹

BY A. J. VAN ROSSEM.

Field work in the Mexican state of Sonora undertaken during the past eighteen months by J. T. Wright in the interest of Mr. Griffing Bancroft has resulted in the discovery of several new races of birds. Study of the specimens collected, most of which are now a part of the Dickey collection at the California Institute of Technology, Pasadena, shows that in the cases of at least two species whose ranges extend into the territory covered by the A. O. U. Check-list a change in status is necessary.

The first of these is *Camptostoma imberbe ridgwayi* which Brewster (Bull. Nuttall Ornith. Club, 7, 1882, p. 208), on the basis of Arizona specimens, long ago distinguished from the typical race. The form remained in good standing for some years, but the range ascribed to it in the second edition (1896) of the Check-list took in too much territory (indeed a good slice of the range of typical *imberbe!*) and finally Ridgway (Bull. U. S. Nat. Mus., 50, pt. 4, 1907, p. 414) eliminated it as an unrecognizable form, which it certainly is on the basis of the 1896 Check-list. However, if confined to extreme northwestern Mexico and southern Arizona there appears to be every reason for its recognition, for birds from that area present uniform and stable differences which set them off sharply from typical *imberbe* of Central America and eastern and southern Mexico.

The characters given for *ridgwayi* by the original describer were larger bill and darker and more ashy coloration. The first of these is perfectly valid, as a glance at the accompanying table of measurements will show. As to color, while there is no doubt that *ridgwayi* is more ashy than *imberbe* in relatively worn plumage there appears to be no color difference whatever when fresh-plumaged specimens of *ridgwayi* and the paler individuals of *imberbe* are compared. The matter of two types of coloration in the typical race seems to have been generally overlooked although Mr. Ridgway

¹Contribution from the California Institute of Technology, Pasadena.



(*ibid.*, footnote) has suggested that sex might be responsible. Intimate personal field acquaintance with *imberbe* in El Salvador convinces me that the darker crowned, more olivaceous type and the more ashy type with the crown nearly concolor with the back are variants which occur independently of age or sex.

The validity of *ridgwayi* appears to rest not alone in its larger bill, but in general size as well. Males are decidedly larger than females and I am inclined to suspect from the measurements given by Ridgway (*ibid.*, p. 415) that faulty field determination of sex is in part responsible for the apparent size similarity of males and females.

The range of *ridgwayi* on the basis of 13 specimens of that form in the Dickey collection is confined to southern Arizona and south throughout Sonora. True *imberbe* ranges northward at least to Tepic, Nayarit (specimen in the Dickey collection) on the Pacific coast, but which form occurs in Sinaloa is not known to me at the present time.

Measurements of males in millimeters.

	<i>Wing</i>	<i>Tail</i>	<i>Exp. Culmen</i>
9 <i>imberbe</i>	51.0-54.5	39.0-43.5	7.2-8.0
6 <i>ridgwayi</i>	55.0-58.0	45.0-48.0	8.7-9.6

The inclusion of Sonora and Arizona specimens of *Platypsaris aglaiae* with true *albiventris* of Colima and Tepic is found to be incorrect. The extreme northern birds constitute a very distinct race for which I propose the name of

Platypsaris aglaiae richmondi,¹ subsp. nov.

Type.—Male adult; no. 28,347, collection of Donald R. Dickey; Saric, Sonora, Mexico; May 14, 1929; collected by J. T. Wright, original number 3249.

Subspecific characters.—Most nearly resembling *Platypsaris aglaiae albiventris* (Xantus) of central western Mexico, but coloration of adult males slightly paler and very much grayer with no buffy or brownish tones; back "slate gray"² fading to "neutral gray" or "light neutral gray" on rump, upper tail coverts and rectrices; underparts more purely (less creamy or buffy) white, the flanks, sides and breast washed with "deep gull gray" or "light neutral gray." In typical *albiventris* the corresponding parts of the adult males are washed or tinged with "mouse grays" or "olive-grays." Females with center of pileum "slate gray" fading to "light gull gray" or "pale gull gray" on forehead and deepening to "slate color" on nape; back nearly pure "neutral gray" fading to "light grayish olive" on rump; underparts *very much* paler than in *albiventris*; chin, throat and central abdominal region very pale (almost white) "light buff"; pectoral region, flanks and under tail-coverts more or less tinged with "light ochraceous buff." The females of *albiventris* have the underparts almost uniform "cinnamon buff," with only the chin and median abdominal region approaching white.

¹Named for Dr. C. W. Richmond of the United States National Museum.

²Colors in quotes from Ridgway, *Color Standards and Color Nomenclature*, 1912.

Range.—The Mexican state of Sonora north into extreme southern Arizona. The whereabouts of the specimen recorded by Price (Auk, 5, 1888, p. 425) from the Huachuca Mountains in extreme southern Arizona, is unknown to me. There can be no question, however, that it belongs to *richmondi*, as in all probability do the records from the Pacific slope of Chihuahua.

Remarks.—While the five females and the two young males of the new race are very uniform in color, save for the rose colored throats of the males, the ten adult males present two distinct extremes of coloration. These may be called the gray-bellied and white-bellied extremes. Although the two are fully connected by individual variation the gray type is the more common, for a somewhat arbitrary division places seven on the gray side and three on the white. The same variation is shown in the series of seven adult males of *albiventris*, the white (or to be more exact in this case, creamy white) type being represented by two birds to five of the darker birds. Xantus' type of *Hadrostomus albiventris* which, by the courtesy of the U. S. National Museum, has been examined in the present connection, represents the white-bellied extreme. I have therefore selected the same color extreme to serve as the type of *richmondi*. The description of the adult male given by Ridgway (*ibid.*, p. 856) applies much better to *richmondi* than to *albiventris* and I strongly suspect was drawn from a specimen of the former race.

In this most northern race of *Platypsaris aglaiae* there is, in the case of the females, an interesting uniformity of characters compared with the color variations seen in the extreme southern form *latirostris*. In the latter instance the long series of adult males presents variations similar to those seen in *richmondi* and *albiventris*. The equally comprehensive female series (all collected by the writer) shows scarcely any two which are identical, particularly in regard to the color of the pileum. That this variation is in any way dependent on age is impossible, for both gray headed and black headed extremes are represented not alone among the fully adult females, but among partially grown juveniles as well.

Material examined.—*Platypsaris aglaiae albiventris*: Mexico: Nayarit (Tepic; Santiago), 6; Colima (plains of Colima; Colima), 3. *Platypsaris aglaiae richmondi*: Mexico: Sonora (Saric; Tesia; Chinobampo; Guirocoba), 17.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



FOUR NEW FORMS OF BIRDS FROM SZECHWAN,
CHINA.

BY J. H. RILEY.¹

Recently the Rev. Dr. David C. Graham forwarded to the U. S. National Museum a small lot of birds from Mount Omei, Szechwan. While the collection is small, it contains a number of interesting and rare forms from this part of China. Three timaline forms and a pigeon are deemed worthy of description. The latter had previously been sent from near Tatsienlu and Sungpan, and more recently Dr. J. F. Rock has sent it from south of Tatsienlu. As this series proves somewhat different from more northern birds it is given a name. The four forms may be described as follows:

***Columba rupestris austrina*, subsp. nov.**

Type.—Adult male, U. S. National Museum, No. 314,006, Chengtze, 14,500-15,900 feet, Szechwan, China, May, 1929. Collected by Joseph F. Rock (original number 1235).

Similar to *Columba rupestris rupestris* of north China, but averaging darker above, especially the upper tail-coverts. Wing, 237; tail, 129; culmen from cere, 11 mm.

Remarks.—The U. S. National Museum has three males of this form from the type locality; one adult male, one immature male and three adult females from Tatsienlu; one male from Nachuka, and one male from Sungpan. Of *Columba rupestris rupestris*, the Museum possesses three males and one female from Inner Mongolia, one male from extreme north-east Kansu, and one female from the Eastern Tombs, Chihli. All the southern specimens average darker on the upper tail-coverts. The single male from Sungpan is somewhat intermediate; the upper tail-coverts are slightly lighter than those of the more southern birds, but darker than in the northern race; I would, however, place it with the southern race as it seems nearer to it.

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***Yuhina nigrimentum quarta*, subsp. nov.**

Type.—Adult male, U. S. National Museum, No. 307,776, Tseo-jia-keo, 3,000–4,000 feet, Szechwan, China, March 31, 1926. Collected by David C. Graham.

Similar to *Yuhina nigrimentum intermedia*, but paler, especially on the breast and belly; the bill longer. Wing, 61.5; tail, 45.5; culmen, 12 mm.

Remarks.—Graham has sent from time to time seven specimens of this form from Tseo (or Huang)-jia-keo, which is south of Suifu, near the Yunnan border. These were at first identified as *Yuhina nigrimentum intermedia*, but last spring three specimens of the latter were forwarded by Doctor Rock from northwest Yunnan, which are considerably darker on the breast and belly. Dr. Graham has also sent a single specimen of the new form from Mount Omei, 6,500 feet. In Fokien a still paler form occurs, *Yuhina nigrimentum pallida*.

The culmen in the three Yunnan specimens measures: 11–11.5 (11.2) mm. In the eight Szechwan birds: 11.5–12.5 (12.1) mm. The sexing in both series was done by native collectors and is unreliable.

***Yuhina gularis omeiensis*, subsp. nov.**

Type.—Adult male, U. S. National Museum, No. 317,428, Mount Omei, 4,000 feet, Szechwan, China. Collected by David C. Graham.

Similar to *Yuhina gularis griseotincta*, but crest clove brown instead of sepia, the upperparts, throat, and underparts much lighter. Wing, 62; tail, 60; culmen, 15 mm.

Remarks.—The U. S. National Museum possesses two specimens of *Yuhina gularis griseotincta*, one from near Tengyueh, which is near the type locality of the race, and the other from the Luddü Mountains, much further north, between the Mekong and the Yangtze. The Tengyueh specimen was taken in March and the Luddü bird in August. The Tengyueh example is darker and richer in color, especially on the throat and chest; the throat and chest in the Luddü bird being especially pale. The latter is molting, but the new crest feathers which are coming in are sepia as in the Tengyueh bird. Dr. Graham sent three males taken on Mount Omei, which are quite uniform and differ quite appreciably from the Yunnan birds. *Yuhina gularis yangpiensis* I have never seen, but Rothchild (Novit. Zool., vol. 33, 1926, p. 276) says it is darker on the back and more strongly washed below with rufous than *Y. g. gularis*, while *Y. g. omeiensis* is even lighter than *Y. g. griseotincta*.

***Garrulax albogularis laetus*, subsp. nov.**

Type.—Adult female, U. S. National Museum, No. 317,407, Mount Omei, 3,000 feet, Szechwan, China. Collected by David C. Graham.

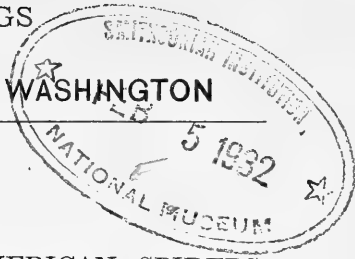
Similar to *Garrulax albogularis eous*, but darker above and below, especially on the forehead; lighter than *Garrulax albogularis albogularis* above, more of a light brownish olive than saccardo umber, the tail with

a more grayish cast. Wing, 133; tail, 136; culmen, 22.5; tarsus, 41; middle toe, 24 mm.

Remarks.—When *Garrulax albogularis eous* was named earlier in this volume, p. 79, four rather poor specimens were available from Szechwan, and these seemed so close to *Garrulax albogularis albogularis* that it was deemed unwise to name it without better material. Dr. Graham has recently sent in nine specimens in good fresh fall plumage, all taken on Mount Omei, 3,000 to 6,000 feet, during November. These prove to be darker than the Yunnan race, but lighter than *albogularis* from Nepal. The tail in *laetus* and *eous* has a grayish cast apparently not present in *albogularis*, but this may be seasonal as the only Nepal specimen available is undated.



PROCEEDINGS
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ON FIFTEEN NEW NORTH AMERICAN SPIDERS.

BY RALPH V. CHAMBERLIN AND WILLIS J. GERTSCH.

The new spiders described in the present paper were detected by the authors while identifying several general collections of spiders. They pertain chiefly to the clubionid genera *Phruronellus* and *Phrurolithus* as these have been defined by the senior author, in whose collection the types are deposited.

CLUBIONIDAE.

Genus *Phruronellus* Chamberlin.

Phruronellus Chamberlin. Can. Ent. 53 : 69, 1921.

Cephalothorax nearly circular, narrowed in head region, uniformly colored in black or brown, without definite pattern. Anterior eye row procurved, the medians usually smaller than the laterals. Posterior eye row slightly procurved or straight. Width of clypeus variable, less than the diameter of an anterior lateral eye to three times as wide, highest in males. Labium wider than long. Endites broadest at middle. Anterior femora often darkened. First tibia armed below with five pairs of spines. Palpus of male large, the femur with a hooked knob basally or at middle, the tibia with a two-spurred apophysis. Abdomen dark above, unmarked, or with white spots.

Genotype.—*Phrurolithus formica* Banks.

Phruronellus formidabilis, sp. nov.

Male.—Cephalothorax uniform blackish throughout. Sternum, maxillae, and labium blackish, lighter than the carapace. Legs yellow except the femur of the first which is black dorsally and on the sides and yellow on the ventral surface, and the femurs of the other three legs which have black bands on the lateral surfaces. Palpus blackish. Abdomen shining black, with a faint indication of an antero-longitudinal and a median transverse lighter band on dorsum. Venter blackish. Spinnerets yellow.

Eyes of both rows procurved, those of the second row equal in size and equidistant, those of the anterior row with the medians smaller and farther apart than a median and a lateral. Clypeus about twice as wide as the diameter of an anterior lateral eye.

Femur of male palpus with a hooked knob near the base below. Tibia of palpus with a ventral and a lateral apophysis, the lateral extension long and distally curved downward.

Length. 2.1 mm.

Type locality.—A male from Fish Lake, Utah, taken September 4, 1929. A male paratype from the same locality.

***Phruronellus pelvicolens*, sp. nov.**

Male.—Cephalothorax uniform brown. Sternum yellow, blackish on margins. Maxillae and labium yellow. All the legs and the basal joints of palpi yellow. Abdomen brown to black, lighter in middle region. Venter brown to black. Spinnerets yellow.

Eyes of posterior row straight, equal in size and equidistant, the anteriors slightly procurved, the medians smaller and separated by more than their radius, subcontiguous with the laterals. Clypeus about twice the diameter of an anterior lateral eye.

Femur of male palpus with a hooked knob near the base beneath. Tibia with a long ventral and longer lateral apophysis, the latter slightly curved.

Length, 2.05 mm.

Female.—Eyes of first row procurved, medians smaller, less than a radius apart, subcontiguous with laterals. Posterior row of eyes straight, the medians oblique, less than a radius apart, slightly farther, a radius, from laterals. Clypeus once and a half as wide as the diameter of an anterior lateral eye.

Type locality.—A male (holotype) from Mt. Ellen, Henry Mountains (Wayne County), Utah, taken September 11, 1929. A male paratype from the same locality. Other locality: Males from Montpelier (Bear Lake County), Idaho.

Discussion.—This species differs from others of the genus in having the femora without black markings.

***Phruronellus pictus*, sp. nov.**

Male.—Carapace brown to black. Sternum and labium blackened, coxae and maxillae yellow. Legs yellow, femur of first leg black, last three femora black with lateral yellow bands. Palpus blackened. Dorsum black with indistinct lighter spots at the middle. Venter black, lighter than the dorsum. Spinnerets white.

Eyes of posterior row slightly procurved, equal in size, the medians oblique and slightly nearer to each other, less than a radius, than to the laterals, separated by approximately a radius. Anterior eyes procurved, the medians smaller, separated by more than a radius, subcontiguous with the laterals.

Femur of male palpus with a hooked apophysis near the base beneath. Tibia of palpus with two long spurs, the lateral extension longer.

Length, 2.05 mm.

Female.—Colored like the male except that the posterior femora are without black markings and with the lighter spots on the dorsum well

defined, white, and another small white spot at the distal end of the abdomen.

Epigynum much like that of *P. pugnatus* Emerton.

Length, 2.1 mm.

Type locality.—Male holotype from Bountiful, Utah, March 29, 1929.

Female allotype from same locality.

Phruonellus californicus, sp. nov.

Female.—Carapace brown throughout. Sternum, maxillae yellow, tinged with black on margin. Labium dark. Legs yellow, the first and second femora blackened, the first tibia slightly. Abdomen black on dorsum, with indistinct spots and chevrons. Venter lighter, lightest at base. Spinnerets white.

The eyes of the anterior row procurved, the medians smaller, separated by more than their radius and subcontiguous with the laterals. The posterior eyes straight, equal in size and equidistant. Clypeus about as wide as the diameter of an anterior lateral eye.

Type locality.—Female holotype from Berkeley, Calif.

Phruonellus floridae, sp. nov.

Female.—Cephalothorax uniform black. Sternum blackish, darkest on the margins. Labium and endites only slightly tinged with black. Legs yellow, femurs blackened. Abdomen black with two rather well defined lighter blotches at middle of dorsum. Venter grayish. Extreme caudal portion of abdomen with a white spot. Spinnerets gray.

The eyes of the anterior row procurved, about equal in size, the medians a radius apart, subcontiguous with the laterals. The eyes of the posterior row about straight, about equal in size, spaced equidistantly. Clypeus about as wide as the diameter of an anterior lateral.

Spermathecae of epigynum of female about a radius apart.

Type locality.—Female holotype from Newman's Lake, Florida. R. V. Chamberlin, Coll.

Phruonellus minnetonka, sp. nov.

Male.—Carapace brown throughout. Sternum, maxillae, and labium yellowish, tinged with black on margins. Legs yellow except femur I and II which have lateral black stripes. Abdomen dark brown to black on dorsum, paler on venter. Spinnerets white.

The eyes of the anterior row procurved, medians smaller, separated by a radius and subcontiguous with the laterals. Posterior row straight, equal in size, equidistant, the medians oblique. Clypeus scarcely twice as wide as an anterior lateral eye.

Femur of male palpus with a hooked process near the basal end. Tibia armed on the outside with a long tapering process and a ventral branch of almost equal length.

Length, 2.05 mm.

Female.—Marked as in male.

Epigynum with the spermathecae round, their diameter apart. Epigynal openings transverse, rather close together.

Length, 2.1 mm.

Type locality.—Male holotype from Minnetonka, Minn. Female allotype and male and female paratypes from the same locality.

Other locality.—Starkville, Miss.

Genus *Phrurolithus* C. Koch.

Phrurolithus C. Koch. 1839. Die Arachniden, VI, p. 105.

Phrurolithus (sens. str.) Chamberlin, Can. Ent., 53, p. 69, 1921.

Cephalothorax nearly circular, narrowed anteriorly, yellow with black markings. Anterior eyes about equal in size, procurved. Posterior eyes near straight, about equal in size. Width of clypeus about the width of an anterior lateral eye or less in both sexes. Labium wider than long. Endites broadest at middle. Anterior tibiae blackened, the first armed below with six or seven pairs of spines. Palpus of male large, the femur with a low hump below, the tibia with a single long apophysis on the outer side. Abdomen with more or less distinct chevrons.

Genotype.—*G. festivus* C. Koch.

Phrurolithus mormon, sp. nov.

Male.—Carapace yellow, blackened at cephalic end and along radial striae, margined in black. Sternum, maxillae, labium and coxae yellow. Legs all yellow except the first tibiae which are blackened. Dorsum of abdomen black. Venter grayish, caudally with a few black marks. Spinnerets gray.

All eyes but the posterior medians on black patches. Anterior row of eyes procurved, about equal in size, the medians a radius apart, subcontiguous with the laterals. Posterior row of eyes straight, about equal in size, spaced equidistantly. Clypeus less than the diameter of an anterior lateral eye.

Femur of male palpus with a low hump at distal end below; the tibia with a long curved process which remains broad until distally where it terminates acutely.

Length, 2.1 mm.

Female.—Carapace yellow with blackish markings at radial and cephalic striae, margined with black. Sternum, maxillae, labium yellow. All legs yellow, anterior tibiae slightly darkened. Abdomen blackish, posteriorly with four or five more or less distinctly indicated chevrons. Extreme caudal region white. Venter grayish. Spinnerets white, the region ringed with black.

Spermathecae of epigynum oval, their diameter apart. Epigynal openings about a diameter apart.

Clypeus less than the diameter of an anterior lateral eye.

Length, 2.35 mm.

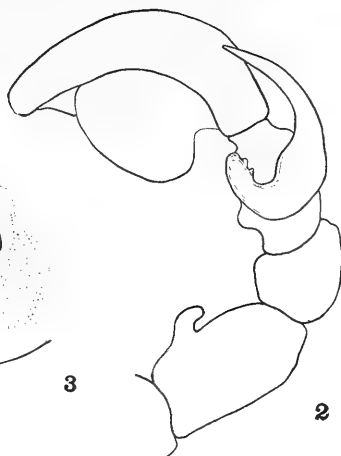
Type locality.—Male holotype from Salt Lake City, Utah, taken March 3, 1928. Female allotype and male and female paratypes from same locality.



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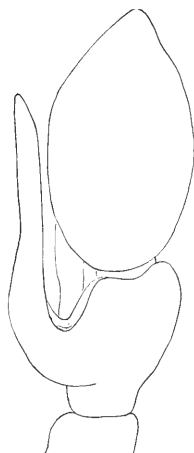
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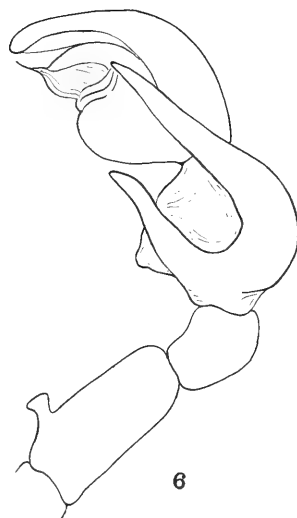
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- Fig. 1. *Phruronellus formica*, left male palp, ectal view.
 Fig. 2. Left male palp, ectal view, of *Phruronellus similis*.
 Fig. 3. Epigynum of *P. similis*.
 Fig. 4. Left male palp, ectal view, of *Phruronellus formidabilis*, sp. nov.
 Fig. 5. Dorsal view of the same.
 Fig. 6. Left male palp, ectal view, of *Phruronellus pelvicolens* sp. nov.

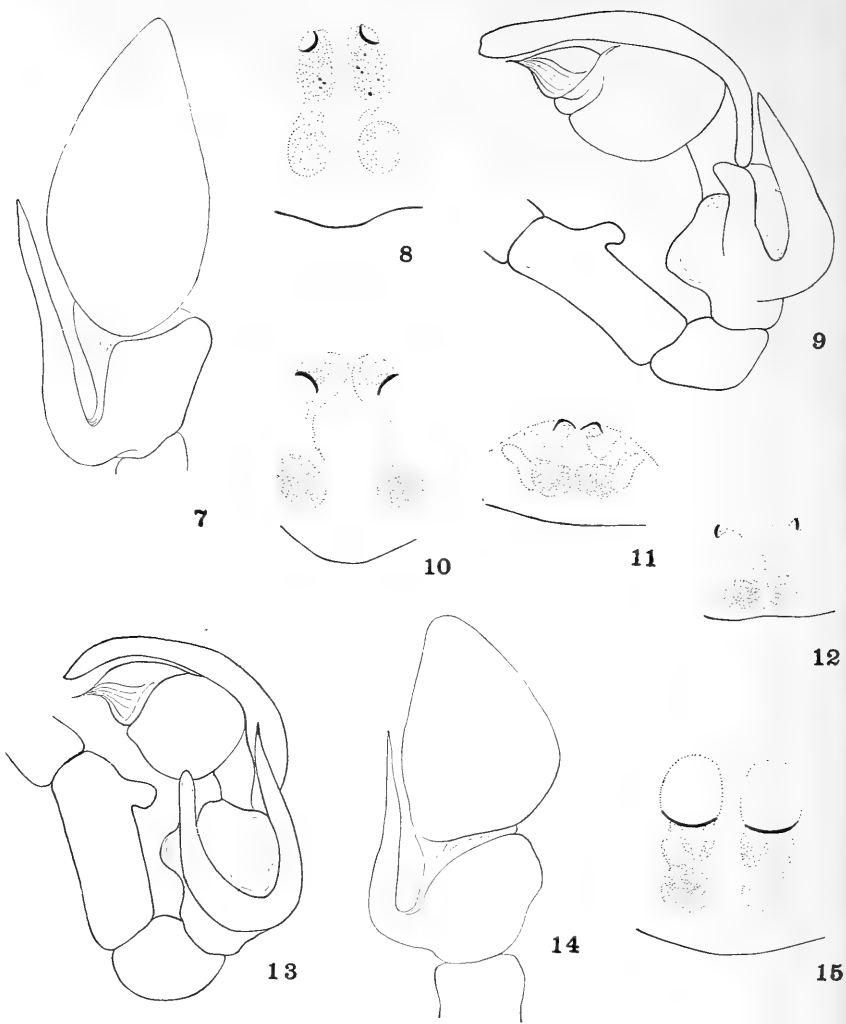
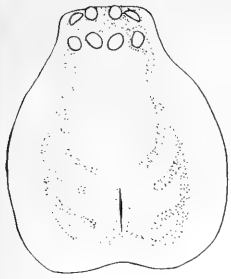
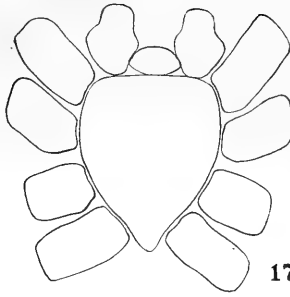


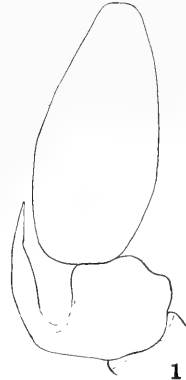
Fig. 7. Left male palpus, dorsal view, of *Phruronellus pelvicolens* sp. nov.
 Fig. 8. Epigynum of the same.
 Fig. 9. Left male palpus, ectal view, of *Phruronellus pictus* sp. nov.
 Fig. 10. Epigynum of the same.
 Fig. 11. Epigynum of *Phruronellus californica* sp. nov.
 Fig. 12. Epigynum of *Phruronellus floridae* sp. nov.
 Fig. 13. Left male palpus, ectal view, of *Phruronellus minnetonka* sp. nov.
 Fig. 14. Left male palpus, dorsal view, of the same.
 Fig. 15. Epigynum of the same.



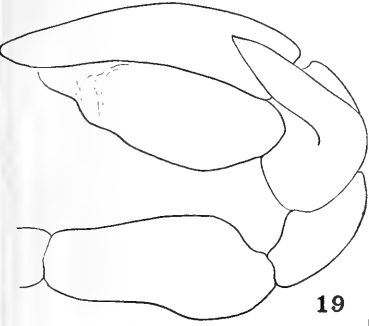
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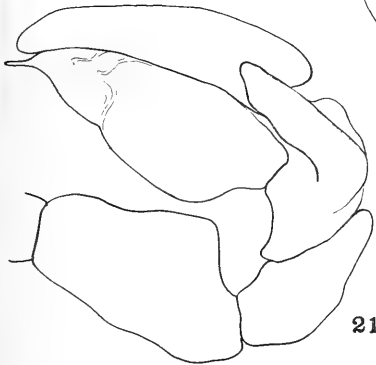
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Fig. 16. Cephalothorax, dorsal view, of *Phrurolithus mormon* sp. nov.

Fig. 17. Sternum and adjacent parts of appendages, of the same.

Fig. 18. Left male palpus, dorsal view of the same.

Fig. 19. Left male palpus, ectal view of the same.

Fig. 20. Epigynum of the same.

Fig. 21. Left male palpus, ectal view, of *Phrurolithus mateonus* sp. nov.

Fig. 22. Left male palpus, dorsal view, of the same.

Fig. 23. Epigynum of *Phrurolithus kentuckyensis* sp. nov.

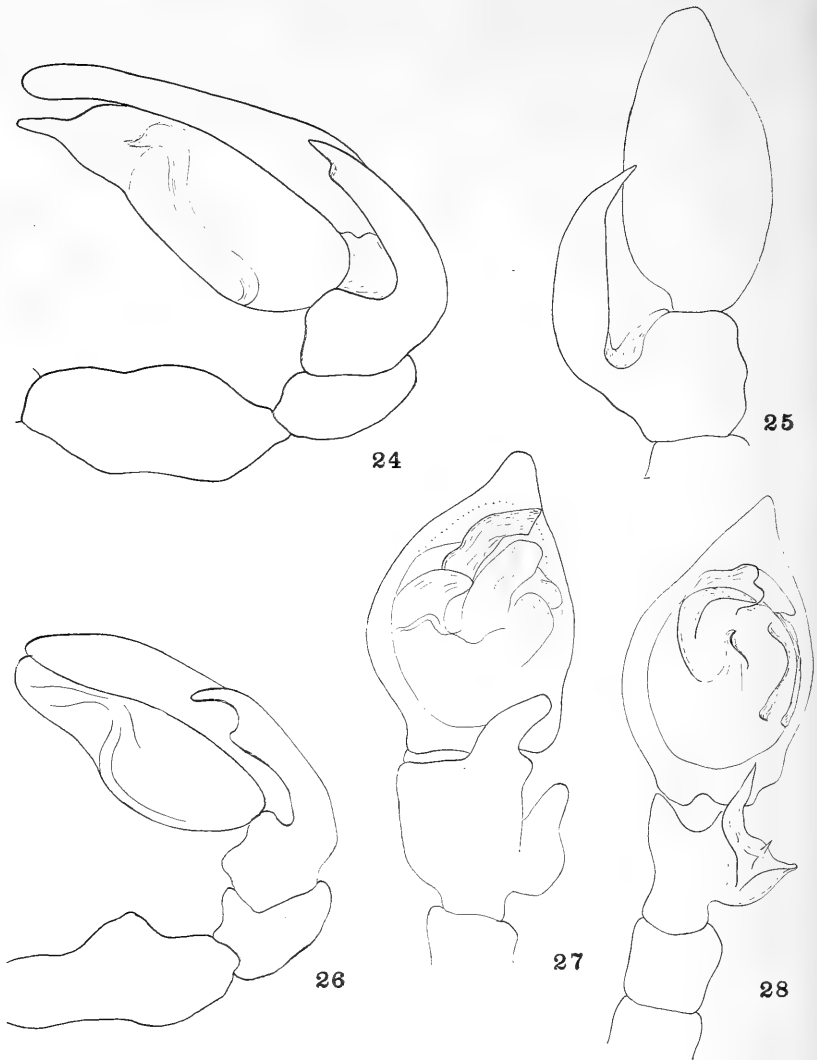


Fig. 24. Left male palp, ectal view, of *Phrurolithus kentuckyensis* sp. nov.

Fig. 25. Left male palp, dorsal view, of the same.

Fig. 26. Left male palp, ectal view, of *Phrurolithus tejanus* sp. nov.

Fig. 27. Left male palp, ventral view, of *Agelena oquirrhensis* sp. nov.

Fig. 28. Left male palp, ventral view of *Agelena intermedia* sp. nov.

Phrurolithus mateonus, sp. nov.

Male.—Cephalothorax margined with a narrow black stripe. Pars cephalica laterally invaded by black markings that extend posteriorly around the pars thoracica, darkest in region of radial striae, leaving a median longitudinal yellow band from the eye region back nearly to posterior margin, and a light submarginal band around the carapace. Sternum, maxillae and labium yellow. Legs yellow (anterior legs missing in holotype). Dorsum of abdomen blackish, with a white spot in caudal region; venter white basally, blackish distally. Spinnerets yellow, ringed in black.

Anterior row of eyes procurved, equal in size, medians separated by less than a diameter and subcontiguous with the laterals. Posterior eyes nearly straight, about equal in size, the medians oval, distinctly more than a radius apart, less than a radius from the laterals. Clypeus as wide as the diameter of an anterior lateral eye.

Distal end of femur of palpus with a low hump armed with stiff hairs. Tibia with a long curved process.

Length, 2.3 mm.

Type locality.—Male holotype from Jasper Ridge (San Mateo Co.), California, 1920 (J. C. Chamberlin, coll.). A male paratype from Berkeley, Calif.

Discussion.—A male from Berkeley is referred to this species with some doubt. In this specimen the tibial apophysis is acutely ended, slightly longer than in *P. mormon*.

Phrurolithus kentuckyensis, sp. nov.

Male.—Carapace yellow, margined in black, lateral and cephalic striae with a few black markings. All eyes except posterior medians on black patches. Labium, maxillae, and sternum yellow. Legs yellow except the first femur, patella and tibia which are blackened. Basal half of dorsum of abdomen blackish with yellow markings; posterior portion with four black chevrons. Venter gray to white, with darker markings distally. Spinnerets white, ringed with black.

Anterior row of eyes procurved, about equal in size, medians separated by their radius, subcontiguous with the laterals; posterior row of eyes straight, about equal in size, equally spaced, about a radius apart. Clypeus slightly less than diameter of anterior lateral eye.

Femur of palpus with a low rounded hump near distal end below. Tibia armed with a long flat curved process that is distinctly notched near distal end.

Length, 2.3 mm.

Female.—Carapace with black markings more distinct than in male. Sternum, labium, and maxillae yellow. Legs yellow, the first two indistinctly, the last two distinctly annulate in black. Abdomen gray to yellow, with broken black chevrons on dorsum; venter gray to white with two dark spots midway between epigynum and spinnerets. Spinnerets white.

Anterior row of eyes procurved, about equal in size, the medians sep-

arated by their radius, subcontiguous with the laterals; posterior row of eyes straight, about equal in size, nearer to each other, less than a radius apart, than to the laterals, a radius apart. Clypeus less than the diameter of an anterior lateral eye.

Epigynum with the spermathecae less than a diameter apart.

Length, 2.9 mm.

Type locality.—A male from Quicksand, Kentucky. Female allotype and male and female paratypes from the same locality.

***Phrurolithus tejanus*, sp. nov.**

Male.—Cephalothorax yellow, margined with a narrow black stripe, with a few black markings at cephalic and radial striae. Sternum, maxillae, labium, yellow. Legs yellow, the distal end of femur, the patella and most of tibia of first pair of legs darkened, the other legs with black annulae. Palpi yellow with brown markings. Dorsum of abdomen yellow with distinct broken chevrons at the distal end, darkened on the sides in the basal region. Venter yellow with a few black maculations near spinnerets, which are yellow in color.

The first row of eyes procurved, the medians smaller, separated by less than a radius and subcontiguous with the laterals. Posterior row of eyes straight, equal in size, the medians separated by about a radius, separated from the laterals by less than a radius. Clypeus as wide as the diameter of an anterior lateral eye.

Distal end of femur of palpus with a low hump armed with stiff hairs. Tibia with a long curved process that is hooked distally.

Length, 2.8 mm.

Type locality.—Male holotype from Austin, Texas (R. V. Chamberlin).

AGELENIDAE.

***Agelena oquirrhensis*, sp. nov.**

Male.—A light colored form. Cephalothorax with yellow median longitudinal band and lateral bands, the intervals with some short black hairs. Legs all yellow, with spines and hairs black. Chelicerae and labium brown, maxillae and sternum yellow. Palpi yellow to the tibia and tarsus which are brown to black. Abdomen with black hairs, gray to black, with a conspicuous yellow longitudinal stripe the length of the dorsum. Venter yellow to white, laterally with two interrupted narrow black stripes. Spinnerets yellow, the apical joint of the hind one shorter than the penultimate.

Eyes of second row recurved, equal in size, the medians slightly closer to each other than to a lateral, with the lateral and a median nearly a diameter apart. Front row recurved, equidistant, laterals slightly larger. All eyes on black spots.

Tibia I with three pairs of spines. Tibia II with an apical and submedian pair and a single basal spine. Lower margin of chelicera with two teeth, the upper with three. Tarsus of male palpus with a heavy black chitinized conductor. Tibia as broad as long with two heavy processes on the outer side.

Female.—Pattern as in male but darker in color. Spines and chelicerae as in male.

Type locality.—Male holotype from Butterfield Canyon (Oquirrh Mountains), Utah, taken in April, 1929 by Ralph Goodwin. Mature allotype from same locality.

***Agelena intermedia*, sp. nov.**

Male.—Carapace reddish brown with a lighter median longitudinal band that is as wide as the eye rows and two lateral lighter marginal bands scarcely as wide, the three clothed with short white hairs, the intervals between black with black hairs. Chelicerae, maxillae, labium, and sternum brown with black hairs. Legs lighter in color, with indistinct brown annulae and blotches, clothed with black and white hairs. Abdomen with black and white hairs; dorsum with an indistinct longitudinal light brown stripe flanked on each side by black regions that extend laterally to the venter, which is light brown. Spinnerets light brown, the distal joint of hind pair shorter than the penultimate.

Eyes in two procurved rows, those of the posterior equidistant and equal in size, about a diameter apart, those of the anterior row slightly larger than the posteriors, equidistant, less than a diameter apart.

Tibia I armed beneath with six spines, a basal, a submedian, and an apical pair. Tibia II with one of the basal pair missing. Tibia of palpus presenting a pointed ventral distal process that extends somewhat over the cymbium, a blunt excavated projection on the outside, and a short dorsal process. Tarsus of palpus as in *A. californica* Banks. Lower margin of the furrow of the chelicerae with three teeth (the smaller middle one missing on the right chelicera of the holotype, but paratypes (immature females) with three teeth on the margin).

Type locality.—Male holotype from La Honda (San Mateo Co.), California, taken by J. C. Chamberlin, Nov. 4, 1922.

***Dendryphantes unicus*, sp. nov.**

Male.—Carapace black to brown, sparsely covered with whitish hairs; ocular region black with black setae that project over the anterior eye row. Sternum brown; labium brown, longer than wide and anteriorly rounded; maxillae brown with a small but distinct hook at the anterior outer margins. Chelicerae brown, the lower margin of the furrow with one tooth, with two smaller teeth on the upper margin. First pair of legs yellow, except femur which is brown, sparsely set with black setae and clothed with white hairs, longest under femur. Last three pairs of legs and palpus yellow with some brownish spots, sparsely clothed with white hairs. Dorsum of abdomen black with indistinct lighter spots and transverse chevrons in the posterior portion, thickly set with whitish hairs; venter gray, clothed with white hairs.

Spines: Tibia I three pairs below, II one pair and one singly behind; metatarsus I and II two pairs below each. Tibia of palpus with two processes of about equal length, one dorsal and one lateral on the outer side; tube of palpus heavy, gradually elongated and truncately ended.

This species may be distinguished from all other forms from the United States by the peculiar double apophysis on the tibia of the male palpus.

Type locality.—A male from Uintah Co., Utah, taken by R. V. Chamberlin, Jr., October, 1928.

***Dendryphantes concoloratus*, sp. nov.**

Male.—Carapace reddish brown with a few white hairs on the sides. Eyes on black spots, those of the second row nearer to the first row than the third. Sternum yellow; labium brown, about as long as wide; maxillae brown, the anterior margin rounded, the outer side with a blunt point. Chelicerae with a single tooth on the lower margin, two on the upper. Distal joints of first leg light brown, femur, coxa, and trochanter white, sparsely clothed with white hairs. Three hind pairs of legs white to yellow, clothed with white hairs. Proximal joints of palpus yellow, tarsus brown, clothed with white hairs. Abdomen with a wide white stripe on each side of dorsum, in the middle reddish brown with darker marks arranged in indistinct chevrons; venter light brown.

Spines: Tibia I three pairs below, II two pairs and one singly behind; metatarsus I and II two pairs below. The tibial apophysis of palpus simple; the embolus bifurcate, one of the branches considerably longer than the other. In the type the right first leg has been lost and the one replaced (much shorter than the left one) does not show spine characteristics.

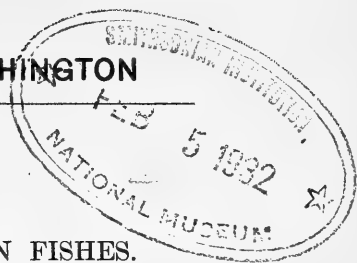
Type locality.—The male holotype from near Woodside, California, January 29, 1928, taken by J. C. Chamberlin.

***Dendryphantes verecundus*, sp. nov.**

Male.—Carapace reddish brown, darker on the sides, with a few black setae on the ocular region. Eyes on black spots, the middle row nearer the front eyes, a heavy band of white scales beginning at each lateral eye of the first row and continuing on the sides posteriorly around the carapace to a point below the median furrow where they nearly meet from each side; area of ocular quadrangle with a few white scales. Sternum, maxillae, and chelicerae brown. Coxa, trochanter, and femur of leg I black, the remainder of leg yellow with wide brown annulae at the articulations of the joints. Coxae and trochanter of legs II, III, and IV white, femurs black, remainder of leg yellow with brown annulae at the articulations of the joints; all legs clothed sparsely with black and white hairs; palpus brown with a few white hairs on femur above. Dorsum of abdomen brown with a basal and half a dozen transverse white bands, which are indistinct through the middle region; venter blackish, lighter at the sides.

Spines: Tibia I three pairs below, II one pair and two behind; metatarsus I and II two pairs below. Chelicerae with a single tooth on the lower margin of the furrow, with two smaller teeth above. Tibial apophysis of male palpus simple; embolus heavy and truncate.

Type locality.—The male holotype from Dry Canyon, Salt Lake City, Utah, June 14, 1929, taken by W. J. Gertsch; male paratypes from same region.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON TROPICAL AMERICAN FISHES.

BY HENRY W. FOWLER.¹

The materials listed in this paper were collected by my friend Mr. R. Dale Benson Jr., while on two trips into the West Indian region. The first lot of specimens was secured in 1929 during the month of March, at Havana, Cuba, Colon in the Panama Canal Zone, Curaçao, Barbados and at Kingston, Jamaica. The second lot of specimens was secured at the Bermudas in April of 1930. Though small the collections contain several interesting species of infrequent occurrence or of importance in distribution. No new species are represented.

ALBULIDAE.

Albula vulpes (Linnaeus).

Two from Jamaica, 174 to 230 mm.

DUSSUMIERIIDAE.

Jenkinsia stolifera (Jordan and Gilbert).

Three from Bermuda, 44 to 48 mm.

CLUPEIDAE.

Harengula anchovia (Valenciennes).

Seventeen from Bermuda, 85 to 110 mm.

Harengula maculosa (Valenciennes).

Ten from Bermuda, 36 to 200 mm.

Opisthonema oglinum (Le Sueur).

Forty-one from Bermuda, 60 to 120 mm.

¹By permission of The Academy of Natural Sciences of Philadelphia.

Chirocentrodon bleekermanus (Poey).

One from Jamaica, 93 mm. Quite likely *Ilisha caribbea* Meek and Hildebrand,¹ based on a small specimen but 57 mm. long is the present species. It agrees in most all details except that canine teeth are not shown in the figure, nor are they mentioned in the description.

ENGRAULIDAE.

Anchoviella choerostoma (Goode).

Seventy-two from Bermuda, 44 to 79 mm.

Anchoviella filifera (Fowler).

One from Jamaica, 72 mm.

Cetengraulis edentulus (Cuvier).

Four from Jamaica, 118 to 142 mm.

ECHIDNIDAE.

Lycodontis moringua (Cuvier).

One from Bermuda, 517 mm.

HEMIRAMPHIDAE.

Hemiramphus unifasciatus (Ranzani).

Six from Bermuda, 128 to 153 mm.

EXOCOETIDAE.

Cypselurus rubescens (Rafinesque).

Four from Barbados, 267 to 270 mm. Anal rays, one simple, 10 branched.

SOLEIDAE.

Achirus lineatus (Linnaeus).

Two from Jamaica, 73 to 82 mm.

HOLOCENTRIDAE.

Holocentrus ascensionis (Osbeck).

Two from Curaçao, 138 to 165 mm.

ATHERINIDAE

Atherina harringtonensis Goode.

Eighty-six from Bermuda, 42 to 78 mm.

¹Field Museum Nat. Hist. Publication 215, Zool. Series, vol. 15, December 20th, 1923, p. 191, p. 10, fig. 1, Porto Bello, Panama.

MUGILIDAE.

Mugil curema Valenciennes.

One from Bermuda, 44 mm.

TRICHIURIDAE.

Trichiurus lepturus Linnaeus.

One from Jamaica, 780 mm.

CARANGIDAE.

Decapterus punctatus (Agassiz).

Two from Bermudas, 137 to 145 mm. Scutes 40 in straight section of lateral line.

Decapterus macarellus (Valenciennes).

One from Curaçao, 172 mm. Depth 6; head 4. Scales 55 in straight section of lateral line, of which 25 keeled scutes. Anal II - I, 29 - 1.

Selar crumenophthalmus (Bloch).

Five from Curaçao, 110 to 115 mm.

Chloroscombrus chrysurus (Linnaeus).

Three from Jamaica, 132 to 156 mm.

SERRANIDAE.

Cephalopholis fulvus (Linnaeus).

One from Havana, 163 mm.

Serranus mystacinus (Poey).

One from Havana, 183 mm.

LUTJANIDAE.

Lutjanus buccanella (Cuvier).

One from Curaçao, 83 mm.

Lutjanus griseus (Linnaeus).

One from Bermuda, 110 mm.

Ocyurus chrysurus (Bloch).

One from Jamaica, 193 mm.

POMADASYIDAE.

Haemulon sciurus (Shaw).

Five from Bermuda, 80 to 136 mm.

Haemulon flavolineatum (Desmarest).

Four from Colon, 82 to 152 mm.; seventeen from Bermuda, 75 to 147 mm.; two from Jamaica, 110 to 155 mm.

Orthopristis poeyi Scudder.

One from Bermuda, 140 mm. Gray blue to mauve or lilac gray generally, under surfaces of head and body whitish. Iris white to gray. Above lateral line irregular golden to gilt longitudinal lines, below 5 or 6 and bands extending on head; all variably broken as spots, blotches or bars and variously complete in sections. Fins all grayish. Gilt bands of caudal peduncle extending on caudal fin. Spinous dorsal with median, subbasal and basal row of dark gilt spots, two on each membrane. Pectoral transparent. Ventral yellowish or golden medially, grayish in front.

SPARIDAE.

Archosargus unimaculatus (Bloch).

One from Colon, 130 mm.

Diplodus argenteus (Valenciennes).

Twelve from Bermuda, 38 to 155 mm.

GERRIDAE.

Eucinostomus gula (Cuvier).

Five from Jamaica, 77 to 104 mm.; twenty-six from Bermuda, 40 to 158 mm. In young examples the premaxillary groove is not entirely scaled over in front, the groove left clearly naked.

Gerres havana Nichols.

Nine from Jamaica, 70 to 90 mm.; one from Colon, 118 mm. Previously only reported from Cuba and Brazil.

Gerres rhombeus Cuvier.

Thirteen from Jamaica, 50 to 100 mm.

CHAETODONTIDAE.

Chaetodon capistratus Linnaeus.

Four from Curaçao, 65 to 78 mm.

TETRODONTIDAE.

Sphoeroides testudineus (Linnaeus).

One from Jamaica, 143 mm.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE GROUND-DOVE OF NAVASSA ISLAND

BY ALEXANDER WETMORE.



The receipt of five skins of the ground-dove from Navassa Island, southwest of Haiti, collected by the Parish-Smithsonian expedition to Haiti, indicates that a distinct form occupies that small island. The new race may be known as:

Chaemepelia passerina navassae, subsp. nov.

Characters.—Similar to *Chaemepelia passerina insularis* Ridgway¹ but grayer, less brownish on the dorsal surface; lighter below; averaging slightly smaller.

Description.—Type, U. S. Nat. Mus., no. 317,212, male adult, Navassa Island, May 10, 1930, collected by W. M. Perrygo (original number 566). Back, rump and upper tail-coverts hair brown; hindneck and posterior part of crown dawn gray, with each feather margined narrowly with deep neutral gray, producing a scalloped appearance; forepart of crown slightly brighter than avellaneous; lesser and middle wing coverts and inner scapulars between vinaceous fawn and fawn color, becoming grayer towards outer margin of wing, the inner feathers spotted with plum purple, the spots having a metallic sheen; concealed portions of primaries and outer secondaries pecan brown; inner secondaries and tips and outer margins of outer secondaries and primaries blackish brown; ninth primary with a very narrow whitish margin on distal part of outer web; sixth to eighth primaries with a narrow margin of pecan brown on outer web; primary coverts pecan brown at base and dull blackish at tips; middle pair of rectrices deep mouse gray; others black with a narrow white edging on outer web of outermost at distal end; chin and throat whitish with a wash of avellaneous; line behind eye vinaceous-fawn; feathers of side of head and sides of upper foreneck pale vinaceous-fawn, with narrow terminal margins of fawn-color; those of lower foreneck and breast blackish basally, with a narrow margin of pale vinaceous-fawn and a very narrow distal edging of fawn color; lower breast and sides between avellaneous and vinaceous-fawn; abdomen dull whitish; under tail-coverts basally hair brown,

¹*Columbigallina passerina insularis* Ridgway, Proc. U. S. Nat. Mus., vol. 10, 1887, p. 574. (Grand Cayman.)

marginated broadly with dull whitish; under surface of wings Mikado brown. Bill blackish at tip; yellowish brown basally; cere blackish brown; tarsus and toes dull sayal brown (from dried skins).

Measurements.—Males, five specimens, wing 79.6–82.0 (80.9), tail 51.6–57.5 (54.8), culmen with cere 9.8 (10.8¹), tarsus 14.8–16.0 (15.2) mm.

Females, five specimens, wing 76.2–83.0 (80.0), tail 52.4–57.5 (53.6), culmen with cere 11.1–11.7 (11.4²) tarsus 13.8–15.8 (14.7) mm.

Type, male, wing 81.0, tail 55.0, culmen with cere 10.8, tarsus 14.8 mm.

Remarks.—The differences marking the ground-dove of Navassa Island were first observed in examining three males and three females in the collections of the American Museum of Natural History obtained in July, 1917, by R. H. Beck. These skins were in considerably worn dress and after some consideration were laid aside since there was possibility that the lighter coloration was due to wear and fading. The receipt of five skins in unworn plumage taken during work of the Parish-Smithsonian expedition of 1930 substantiates the earlier observations of lighter color and leaves no hesitation in describing this race.

The differences noted are more obvious in females than in males.

Though occasional skins of *C. p. insularis* are closely similar to *C. p. navassae* the average of *insularis* is decidedly darker. It is interesting to note that the variation of the Navassa Island bird is in the direction of *C. p. exigua* Riley from Mona Island in the passage between Porto Rico and the Dominican Republic, physical conditions on Mona and Navassa from available information being much the same.

¹Four specimens.

²Three specimens.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ANOTHER NEW SUBSPECIES OF *NANNUS TROGLODYTES*
FROM ALASKA.

BY HARRY C. OBERHOLSER.



During a trip to Alaska in the summer of 1925, Mr. Donald H. Stevenson and Mr. O. J. Murie visited islands off the coast of the southwestern end of the Alaska Peninsula. On two small islands,—Amak Island on the Bering Sea side of the Peninsula, and Amagat Island on the Pacific Ocean side near the mouth of Morzhovoi Bay,—these two collectors obtained a series of the breeding form of *Nannus troglodytes*, which proves to be sufficiently distinct from birds inhabiting the other parts of Alaska to be worthy a name of its own. It seems fitting to name this new race for Donald H. Stevenson, as a slight recognition of his field services to ornithology, and this the more since his untimely death during the following year suddenly terminated a promising career.

***Nannus troglodytes stevensoni*, subsp. nov.**

Subspecific characters.—Similar to *Nannus troglodytes petrophilus*, from Unalaska Island, Alaska, but upper parts, and to a less extent, also the lower surface, more grayish or sooty (less rufescent) in both adult and juvenal plumages; posterior lower parts in adult on the average less heavily spotted with fuscous; bill and middle toe averaging slightly longer.

Measurements (four adult males).—Wing, 51 to 53 (average 52.2); tail, 31 to 32.2 (average 31.8); exposed culmen, 14.5 to 15.5 (average 15); tarsus, 17.8 to 19 (average 18.6); middle toe without claw, 13 to 14.8 (average 14.2).

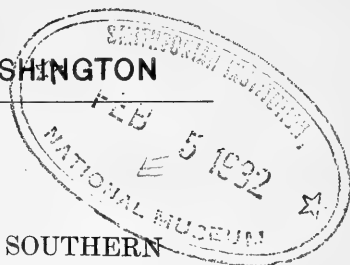
Type.—Adult male, No. 298574 U. S. Nat. Mus., Biological Survey Collection; Amak Island, Alaska; July 16, 1925; D. H. Stevenson; original number 141.

Geographic distribution.—Amak Island and Amagat Island, Alaska; and probably also other neighboring islands and the southwestern end of the Alaska Peninsula.

As in most of the other Alaska races of this species there is considerable

individual variation in this new form; and the differences, while very readily recognizable in a series, are, of course, to some extent overlapped by individuals of the most closely related subspecies, *Nannus troglodytes petrophilus*. It is interesting, however, to note that the color differences are fully as noticeable in the juvenal plumage as in the adult, as is well shown by the series of ten young and five adults from Amak and Amagat Islands that has been examined.

All the wrens of this genus found in North America are now regarded as only subspecifically related. There is, furthermore, not a trenchant character of size or color to separate them as a group from the common wren of Europe, to which all the other Old World forms of the genus are but subspecifically related. Since such a condition is commonly recognized as a criterion of subspecific relationship, there seems to be good reason for treating all the North American birds as subspecies of *Nannus troglodytes*. The details of intergradation have already been presented in the writer's recent paper on the genus (*cf.* Proceedings of the United States National Museum, LV, April 28, 1919, pp. 224-225).

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONTWO NEW FOXES FROM THE SOUTHERN
CALIFORNIAN ISLANDS.

BY J. GRINNELL AND J. M. LINSDALE.

Specimens of the foxes found on several of the Santa Barbara Islands off the coast of southern California have been assembled by us from the various collections on the west coast in order to study the systematic relationships existing within the whole group. This group, we conclude from our study, is properly to be covered under the one specific name, *Urocyon littoralis* (Baird). The specimens gathered together include, as of importance in the present connection, one lot of twenty collected on Santa Rosa Island, in 1927, and one lot of nineteen collected on San Nicolas Island, in 1929 and 1930. Study of these quite sufficient series proves the propriety of considering the animals from each of these two islands a race distinct from all the other forms of island fox. Mr. Donald R. Dickey, to whose collection both series belong, has courteously granted us the privilege of describing these new foxes on the basis of his material.

In view of his vigorous and intelligently conducted quest of the materials here concerned (and likely never to be duplicated), it has seemed to us most appropriate that Mr. Dickey's name be permanently of record in the nomenclature of the island foxes. It is also to be said here that Mr. Dickey had himself planned to name these new forms but later decided to turn the material over to us. These circumstances account for the selection of the name proposed for the well-marked San Nicolas animal.

***Urocyon littoralis santarosae*, new subspecies.**

SANTA ROSA ISLAND FOX.

Type.—Male (adult skin and skull), no. 13407, coll. Donald R. Dickey; Santa Rosa Island, Santa Barbara County, California; November 8, 1927; collected by H. H. Sheldon.

Diagnosis.—Coloration intermediate between that of foxes of San Miguel (subspecies *littoralis*) and of Santa Cruz (subspecies *santacruzae*) islands, but nearer the average for those of Santa Cruz Island. Distinguished from San Miguel Island foxes by having a conspicuously longer tail. Cranially nearest to San Miguel Island foxes, but showing tendencies toward the race on Santa Cruz Island in the following characters. Compared with *littoralis* the present race has the basioccipital narrower, upper carnassial teeth averaging smaller and narrower, and nasals more nearly parallel sided (rather than markedly "hour-glass" shaped) and more sharply pointed posteriorly.

Material.—Twenty skins-with-skulls or skulls-only in the collection of Donald R. Dickey; one skin-with-skeleton, two skulls-only, and two skeletons, in the Museum of Vertebrate Zoology.

Distribution.—Santa Rosa Island, Santa Barbara County, California.

Measurements of Type.—Dimensions, in millimeters, taken by the collector, are as follows. Total length, 741; tail vertebrae, 245; hind foot, 115. Skull dimensions are: greatest length, 105; condylobasal length, 102; basilar length, 93.4; palatilar length, 50.1; zygomatic breadth, 58.8; mastoid breadth, 39.6; breadth across postorbital processes, 33.7; interorbital width, 20.9; width of rostrum, 17.7; height of brain-case at bullae, 37.5.

***Urocyon littoralis dickeyi*, new subspecies.**

SAN NICOLAS ISLAND FOX.

Type.—Male (adult skin and skull), no. 15496, coll. Donald R. Dickey; San Nicolas Island, Ventura County, California; May 6, 1929; collected by H. H. Sheldon.

Diagnosis.—Coloration close to that of foxes from San Clemente Island. Compared with the race *clementae*, skins from San Nicolas Island have slightly darker coloration on the head; but all those from San Nicolas lack the added rufous color, especially on the side of the head, which is a distinctive feature of *clementae*. The present race has the strip of dark gray beneath the eye abruptly joined below by white, there being no trace of the intervening border of clear rufous shown on specimens of *clementae*.

Skulls of *dickeyi* look much like those from Santa Cruz Island. From these they differ in having the brain-case apparently more inflated; foramen magnum, in the series, averaging rounder; nasals projecting farther back than posterior edges of maxillaries; nasals more nearly parallel sided, with posterior ends obliquely truncate; palatines considerably shorter; basioccipital narrower; upper carnassial teeth slightly heavier. Compared with *clementae* the San Nicolas Island skulls have shorter palatines, narrower basioccipitals, narrower and lighter upper carnassial

teeth, and posterior margin of basioccipital sharply V-shaped rather than shallowly U-shaped. The most marked difference is in the nasals which in *dickeyi* project only one-half as far beyond a line passing through the posterior points on the maxillaries as do those of *clementae*.

Material.—Eighteen skins-with-skulls and one skin-only in the collection of Donald R. Dickey.

Distribution.—San Nicolas Island, Ventura County, California.

Measurements of Type.—Dimensions, in millimeters, taken by the collector are as follows. Total length, 730; tail vertebrae, 270; hind foot, 111. Skull dimensions are: Greatest length, 100.2; condylobasal length, 97.2; basilar length, 89.9; palatilar length, 46.7; zygomatic breadth, 57.3; mastoid breadth, 39.5; breadth across postorbital processes, 29.5; interorbital width, 19.5; width of rostrum, 16.9; height of brain-case at bullae, 39.0.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



A NEW BANISTERIA FROM BRAZIL AND BRITISH
GUIANA.¹

BY C. V. MORTON.

The following species of *Banisteria* was detected while identifying a small collection of Malpighiaceae made by Mr. A. Miles Moss in Brazil. This generic name is adopted in accordance with the usage of Robinson and Small in the North American Flora, rather than that of Niedenzu in Das Pflanzenreich. Niedenzu, following Jussieu, refers all of the seven original *Banisteria* species of Linnaeus to other genera, and uses the name in quite a different sense. This procedure can not be justified under any code of nomenclature.

Robinson chose *Banisteria brachiata* L. as the type of the genus, a thoroughly satisfactory selection. The genus *Heteropterys* Kunth becomes therefore a synonym of *Banisteria* L., and the *Banisteria* of Niedenzu is *Banisteriopsis* Robinson. The species here described would come under *Heteropterys* subgenus *Euheteropterys* in Niedenzu's treatment. The subgenus, when recognized under *Banisteria*, is in need of a new name, since the type of *Banisteria* (*B. brachiata* L.), and the type of *Heteropterys* (*B. purpurea* L.) both belong to the subgenus *Eubanisteria*. The new name **Parabanisteria** may therefore be proposed as a substitute for *Euheteropterys* Niedenzu, with *Banisteria laurifolia* L. as type.

***Banisteria mossii* Morton, sp. nov.**

A woody vine; stems slightly angled, glabrous, with numerous conspicuous lenticels, about 2.5 mm. in diameter; internodes 3-4 cm. long; leaf

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blades elliptic, the largest 10.5 cm. long, 4.3 cm. wide, short-acuminate at apex, cuneate at base, entire, glabrous, lustrous, reticulate beneath, the secondary veins (6 or 7 pairs) conspicuous; petioles short (about 5 mm. long), channelled above, glabrous; flowers borne in terminal and axillary panicles, the main axis of the terminal panicle about 10 cm. long in flower, the axillary panicles smaller or reduced to simple racemes; terminal panicle without a common peduncle, 3-branched at base, the lateral branches thinner than the central, the first internode 17-20 mm. long, the upper internodes gradually reduced; rachises terete, densely reddish puberulent (the hairs minute and appressed), the principal one about 1.5 mm. in diameter; pedicels 4-6 mm. long, bibracteate at middle; slender, about 0.5 mm. in diameter, densely reddish puberulent; bracts of the inflorescence oval, obtuse, concave, somewhat twisted, the lower ones 4 mm. long, those of the pedicels similar, about 2 mm. long, densely reddish puberulent; calyx lobes oval, obtuse, recurved at apex, about 2.5 mm. long, densely reddish puberulent outside, glabrous within, 4 of them gland-bearing, the glands 2 to each sepal, distinct, black, oval, 1 mm. long; petals yellow, clawed (the claw about 1 mm. long), the blades oval, 2-2.5 mm. long, obtuse, shallowly and irregularly sinuate, not fimbriate; stamens 10, all fertile, unequal, glabrous; anthers introrse, the connective orbicular, glabrous; ovary pilose; styles 3, straight, glabrous, equal, 3 mm. long; stigmas all short-uncinate, stigmatic on the inner side only; all 3 ovaries developing into fruits or 1 or 2 abortive; fruit a samara, light yellowish-brown or greenish brown, spreading horizontally, the lower margin almost straight except toward apex, thickened, the upper margin thin, membranous, scarcely appendiculate at base, about 35 mm. long, 3 mm. high at base, 2 mm. thick, the narrow basal portion 7-9 mm. long, rather abruptly expanded into the narrowly oval, inequilateral, rounded-obtuse main blade (about 25 mm. long by 12 mm. high); seed borne horizontally, 4 mm. long, 2 mm. high, about 1.5 mm. thick.

Type in the U. S. National Herbarium no. 1,442,595, collected at Pará, State of Pará, Brazil, in 1929, by A. Miles Moss (no. 15).

Banisteria mossii is a very distinct new member of the section *Stenopterys*. The most closely related species is *B. laurifolia*, with which it agrees in having the samaras borne horizontally. The samara itself, however, is very differently shaped, that of *B. laurifolia* being 30 to 35 mm. long, about 10 mm. high at base, and 5 mm. thick, and conspicuously appendiculate on the dorsal side at the base. The seed of *B. laurifolia* is borne almost vertically and is much larger; the cavity in which it is borne is about as high as long.

Two additional specimens of *Banisteria mossii*, agreeing closely with the type, are in the U. S. National Herbarium, both from British Guiana: Upper Mazaruni River, Long. about 60° 10' W., collected Sept. 22-Oct. 6, 1922, by J. S. De La Cruz (nos. 2098, 2221). They had been determined as *Heteropterys candolleana* Juss., a very different plant, which may be known as *Banisteria suberosa* Willd. var. *candolleana* (Juss.) Morton.

Identifications of other recent South American material of this family necessitate the following changes of name:

Banisteria argyrophaea (Juss.) Morton.

Heteropterys argyrophaea Juss. Malp. Syn. 234. 1840.

Banisteria anoptera (Juss.) Morton.

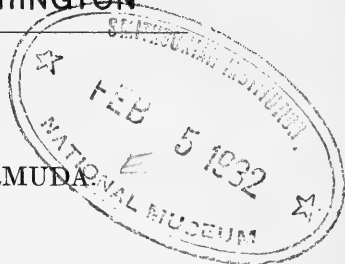
Heteropterys anoptera Juss. Malp. Syn. 276. 1840.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW *POLYGALA* FROM BERMUDA

BY S. F. BLAKE.



The new *Polygala* here described, of considerable interest as the first member of the genus to be reported from Bermuda, is based on a specimen sent for identification by Mr. C. A. Weatherby of the Gray Herbarium.

***Polygala bermudensis* Blake, sp. nov.**

Probably biennial, about 2-stemmed, glabrous throughout; stems angled, about 30 cm. long, apparently ascending; leaves in whorls of 5-8 essentially throughout, mostly equaling or longer than the internodes, obovate, about 1.5-2 cm. long, sharply cuspidate, fleshy; racemes cylindric-conic, acuminate, 7-9 mm. thick, slightly comose at apex; bracts subulate, deciduous; flowers pink-tinged, pedicellate; wings orbicular-obovate, short-clawed, 3.8-4 mm. long, 3-3.2 mm. wide, in fruit conspicuously surpassing the capsule; capsule oval, 2.8-3 mm. long, 2 mm. wide; seeds narrowly obovoid, densely pilosulous, 2.1 mm. long; aril 1-1.2 mm. long.

Subgenus *Orthopolygala*, series *Galioidae*; roots slender but apparently biennial; stems subalately several-angled, 1-1.5 mm. thick, simple or with a single branch above; internodes mostly 4-18 mm. long; leaves sessile, 14-22 mm. long, 3.5-9 mm. wide, acute or obtuse at apex and very sharply cuspidate (cusp about 1 mm. long), cuneate at base, narrowly revolute-margined, rather light green, feather-veined (lateral veins about 3 pairs), densely glandular-punctate and -lineolate; peduncles solitary, terminal, about 2 cm. long; racemes 4-4.5 cm. long, the axis becoming 11.5 cm. long; pedicels 1-1.4 mm. long; bracts subulate, acuminate, glabrous, 1.8 mm. long, with greenish center and narrow pinkish-tinged petaloid margin; upper sepal ovate or oval-ovate, 1.8-2 mm. long, 1.1-1.5 mm. wide, acutish, slightly erose toward apex, glabrous, the greenish center bearing 2 elongate white glands, and usually a shorter one on each side, the petaloid margin pinkish; lower sepals essentially similar but somewhat narrower, about 1.8 mm. long; wings rounded at apex, glabrous, 5-nerved with once or twice forked nerves, bearing 2 longitudinal glands along midnerve; upper petals equaling the wings, obliquely oblong, obtuse, obscurely erose at apex, about 5-nerved; keel equaling the wings, bearing 2 long white glands,

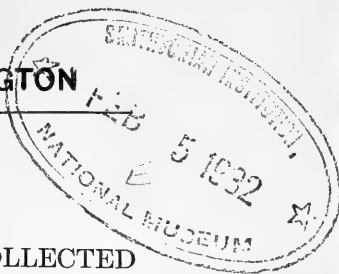
the crest on each side of a cuneate lamella and 4 linear lobes, the terminal one sometimes bifid; capsule oval, subsessile in the floral gland, bearing several glands; seeds shortly and thickly subrostrate at base, the beak 0.2 mm. long; aril glabrous, the 2 linear-oblong scarious lobes 1-1.2 mm. long; style nearly equaling the stigmatic region, the proximal stigmatic lobe capitate, on a short thick stipe, the distal conspicuously stipitate, comose, the stipes connected at base by a quadrate membrane; stamens 8, the glabrous filaments about equaling the anthers.

BERMUDA: Well established over about 2 acres on northwest point of Smith's Island, 28 April 1929, Mrs. Rachel B. Kennedy 134 (type no. 1,414,807, U. S. Nat. Herb.).

In habit and foliage *Polygala bermudensis* is closely similar to *Polygala wilsonii* Small, known only from Salt Key Bank, Anguilla Isles, Bahama Islands, a specimen of which has been available for comparison through the kindness of Dr. E. D. Merrill. In that species, however, the bracts are ovate, the somewhat shorter and proportionately narrower wings are shorter than the capsule at maturity, the capsule is ovate-elliptic, and the ellipsoid-obconic seeds are 2.8 mm. long, more than twice as long as the aril lobes, and provided at base with a slender curved beak 0.5 mm. long. *Polygala flagellaris* Small and *P. boykini* Nutt., which are related to the new species, are at once distinguished by their smaller flowers, with wings at maturity equaling the fruit; the seeds are also different.

No species of *Polygala* is reported from Bermuda in Dr. Britton's "Flora of Bermuda." It is, of course, possible that *P. bermudensis* is only an introduced species, as suggested by the wording of the collector's note, but it is in any case quite distinct from any previously known species of its group. It may well be a hitherto overlooked endemic species of very restricted distribution, as is evidently the case of its closest relative, *P. wilsonii*.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



TWO NEW ASTERACEAE FROM MEXICO COLLECTED
BY GEORGES WORONOW.

BY S. F. BLAKE.

The identification of about 300 specimens of Asteraceae collected in Mexico and northern South America by Mr. Georges Woronow of the Botanic Garden of Leningrad and his assistants has brought to light two new species of the tribe Verbesininae which are described here. About a third of the specimens collected are represented by duplicates in the United States National Herbarium.

Haplocalymma woronowii Blake, sp. nov.

Very slender annual, simple below the inflorescence, thinly pilose; leaves remote, opposite in about 6-10 pairs, alternate in the inflorescence, the larger lanceolate, about 1.5 cm. long, acuminate, obtuse at base, serrate, 3-nerved, short-petioled, hirsute-pilose with subappressed antrorse hairs on both sides, densely so beneath; heads tiny, 11 mm. wide when expanded, several or rather numerous in a narrow and very open panicle, the filiform pedicels 1-4 cm. long; involucre 1-seriate, 2 mm. high, the phyllaries 5, lanceolate, acuminate, erectish-pilose; achenes glabrous, epappose, 1.1 mm. long.

Erect, 25-40 cm. high, the hairs toward base of plant mostly spreading, the others mostly appressed or erectish, with obscurely enlarged bases; petioles 1-2 mm. long, hirsute-pilose; blades of principal leaves 7-18 mm. long, 2-7 mm. wide, thin, serrate above the entire base with 3-4 pairs of low sharp teeth, above dull green and antrorse-pilose, the hairs with small tuberculate bases, beneath griseously antrorse-pilose or substrigose, the hairs along the veins longer and stiffer; uppermost leaves alternate, narrowly lanceolate, 1.5 cm. long or less; panicle 3-14-headed, the divergent to erectish alternate branches bearing 1 to 4 scattered heads; pedicels naked, erect-pilose or substrigose; disk campanulate, in flower 3 mm. high, 2.5-3 mm. thick, in fruit 4 mm. high and thick; phyllaries about 0.7 mm. wide, subherbaceous, with 3 green nerves; rays 5, yellow, neutral, the ovary rudiment 1 mm. long, pilose above, the tube pilose, 0.4 mm.

long, the limb oblong-oval, emarginate, pilose on nerves of back, 4-nerved, 5.3 mm. long, 2.7 mm. wide; disk flowers about 22, their corollas yellow, short-pubescent especially on base of tube and teeth, funnel-form, 2.3 mm. long (tube 0.3 mm., throat 1.5 mm., teeth ovate, 0.5 mm. long); receptacle in fruit acutely conic, 1 mm. high; pales acute to abruptly short-pointed, short-pilose dorsally, shortly hispid-ciliate above, whitish with greenish midline, 2.5 mm. long; achenes obovoid, compressed, bluntly subquadrangular, more or less mottled with black and white; style branches with deltoid hirsutulous penicillate-apiculate appendages.

MEXICO: In pine woods, Torreo el Alto near Uruapan, Michoacan, alt. 1600 m., 21 Jan. 1926, *G. Woronow* 2821 (type no. 1,409,517, U. S. Nat. Herb.; dupl. Herb. Leningrad).

The only species of the genus hitherto known, *Haplocalymma microcephalum* (Greenm.) Blake, of Morelos, is strigillose throughout, with mostly alternate ovate coarsely sinuate-dentate leaves, somewhat larger heads borne in small close cymes at the tips of the peduncles, and a pappus like that of *Hymenostephium*. In general appearance the new plant is closer to species of the section *Diplostichis* of *Viguiera*, such as *V. tenuis* A. Gray and *V. gracillima* Brandege, but it is distinguished from these by details of leaves and heads and by its lack of pappus, as well as its principal generic character, the presence of an involucre composed of only 5 phyllaries in a single series.

Verbesina pterocarpha Blake, sp. nov.

Apparently suffrutescent, 0.5 m. high and more; stem strigillose, glabrescent; leaves alternate or opposite, oblong or obovate-oblong, medium or large, short-acuminate, acuminate at base, petioled, serrate, feather-veined, scabrous and in age lepidote-tuberculate above, beneath slightly paler, densely hirsutulous on veins and veinlets, more sparsely so on surface; heads tiny, numerous in small concave panicles; involucre 2 mm. high, 2-seriate, subequal, the phyllaries ovate, acutish, pilosulous dorsally; rays tiny; pales with conspicuous oblique dorsal wing and recurved-cuspidate tips; achenes tiny, narrowly 2-winged, shortly 2-awned.

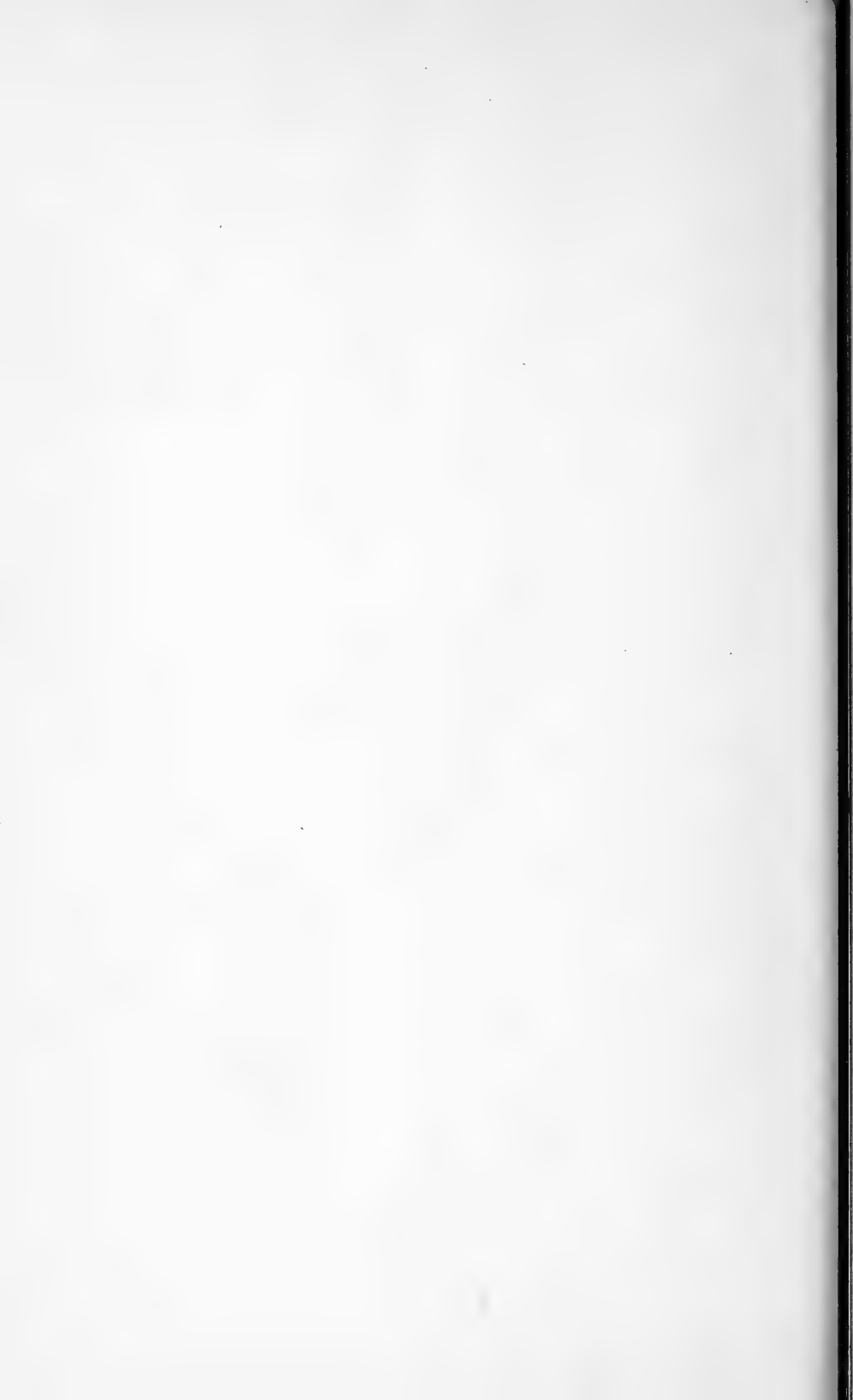
Stems (or branches) simple below the inflorescence, striate, 2-4 mm. thick, herbaceous or somewhat woody, solid; internodes mostly 2-4 cm. long; naked part of petiole flattened above, strigillose or subappressed-hispidulous, 5-10 mm. long; blades 12-21.5 cm. long, 3.5-6.7 cm. wide, short-pointed and with very slender often falcate callous-tipped apex about 3 mm. long, acuminately long-cuneate at base and decurrent on upper part of petiole, serrate or serrulate except for about 3-4 cm. at base with about 27-42 pairs of slender callous-pointed teeth (about 0.5 mm. high, 2-4 mm. apart), thin, above deep green, evenly and densely hispidulous with antrorse hairs with persistent tuberculate bases, beneath densely spreading- or antrorse-hispidulous on costa and lateral veins with several-celled hairs with slightly swollen bases, more sparsely so on surface with mostly antrorse-curved hairs, the costa prominent beneath, whitish, 1-sulcate, the chief lateral veins about 8-10 pairs, prominulous, the secondaries

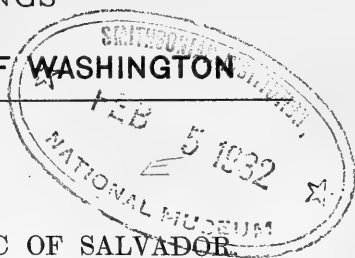
evident and loosely reticulate; peduncles terminal and from the upper axils, 2–6 cm. long, mostly 3–10-flowered, together forming a compound terminal panicle about 4–16 cm. wide, strigillose or subappressed-hispidulous, the bracts minute, subulate, the pedicels divergent, 2–25 mm. long, the terminal ones much shorter than the lateral; heads about 30–35-flowered; disk about 6 mm. high and 8 mm. wide in flower, in fruit (corollas fallen) subglobose, 5–6 mm. thick; phyllaries few, appressed, subherbaceous, greenish, with callous tips; rays apparently few, pistillate, pale yellow, pilose on tube and outer base of limb, the tube 1 mm. long, the lamina suborbicular, 3-denticulate, 2 mm. long and wide; disk flowers pale yellowish, pilose on tube and lower part of throat, 3 mm. long (tube 0.5–0.8 mm., throat narrowly campanulate, 1.5–1.8 mm., teeth ovate, 0.7–0.9 mm.); pales boat-shaped, 2.4 mm. long, 1 mm. wide, indurated and whitish below, greenish above, hispidulous-ciliolate around apex, with recurved-spreading yellowish green short-cuspidate tip, the upper half of back bearing an oblique greenish wing 0.3–0.5 mm. wide, this ciliolate above; disk achenes cuneate-obovate, 2–2.8 mm. long, 1.5–2 mm. wide (including wings), the body black, appressed-pubescent above, the wings narrow, hispidulous-ciliolate, 0.5 mm. wide or less, the awns 2, unequal or subequal, hispidulous outside, stout, 0.4–0.8 mm. long.

MEXICO: Near Uruapan, Michoacan, 21 Jan. 1926, *G. Woronow* 7707 (type no. 1,409,547, U. S. Nat. Herb.; duplicate, Herb. Leningrad); along Río Zumpinito near Uruapan, alt. 1500–1600 m., 21 Jan. 1926, *Woronow* 2680 (Herb. Leningrad; photograph and fragments, U. S. Nat. Herb.).

A member of the section *Saubinetia*, related to *V. angustifolia* (Benth.) Blake, which has a different stem pubescence and larger heads (9.5 mm. wide in fruit); to *V. cymbipalea* Blake, which has a different stem pubescence and heads twice the size of those of *V. pterocarpha*; and, more closely, to *V. seemannii* Schultz Bip., which has relatively narrower and less pubescent leaves, longer rays (6–8 mm. long), narrower achenes with longer awns (1–1.5 mm. long) and obsolescent wings, and pales which nearly or quite lack the conspicuous oblique wing of *V. pterocarpha*.

The two collections on which this species is based differ considerably in foliage characters, although agreeing closely in characters of the inflorescence and heads. In the type collection the leaves are alternate (except for one or two pairs on the branches), larger and griseous-pubescent beneath at least when young, and are rather strikingly similar to those of *V. sororia* A. Gray. In the other collection the leaves are strictly opposite, decidedly smaller (representing the minima in the measurements given above) and somewhat less pubescent beneath. Both collections, however, evidently belong to a single species.



PROCEEDINGS
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FERNS OF THE REPUBLIC OF SALVADOR

BY WILLIAM R. MAXON AND PAUL C. STANDLEY.

The specimens upon which the present paper is based were collected chiefly by Mr. Standley from December, 1921, to May, 1922, during a visit to Salvador for the purpose of making a general botanical survey of that country. The writers have had also the opportunity of examining collections made by Dr. Salvador Calderón, of the Salvadorean Department of Agriculture, which contain several species not otherwise known from the region.

Previous to the work done in 1921-22, Salvador was little known botanically, having been neglected by collectors, perhaps because of its comparative inaccessibility. It is the only one of the five Central American republics lacking an Atlantic coast-line. Within its territory, however, Salvador has better transportation facilities than any adjacent region, a varied topography distinguished for its beautiful and interesting scenery, and a population that is notably kindly and hospitable toward visitors. It is the smallest of the Central American countries and the most densely settled, its total population being exceeded only by that of Guatemala, which is several times as large geographically.

As might be inferred from the density of population, a great part of Salvador is under cultivation, the region being thus in some respects less favorable for botanical work than most tropical countries. Nevertheless there are many areas as yet untilled, and in the higher mountains and coastal lowlands there remain virgin forests possessing a rich and interesting flora. The total number of species of vascular plants now known from Salvador is about 2,000. This is fewer than

recorded for most of the other Central American states, but the discrepancy is largely explained by physical features. The country lies wholly upon the Pacific slope, consequently the flora is homogeneous; there are no very high mountains, the greatest of the numerous volcanoes attaining an elevation of scarcely 2,400 meters; and the rainfall is comparatively scant, approximately 60 inches per year, with the result that there are none of the wet forests that characterize certain portions of each of the other republics.

The lack of moisture makes the region an unfavorable one for ferns, only 87 species being listed herewith. When other parts of Salvador have been thoroughly explored this number will be materially increased, for upon the highest mountains there must remain many species still unknown. It seems worth while, however, to publish the present list, incomplete as it may be, because it is the first separate contribution to a knowledge of the fern flora of the country.

The eastern third of Salvador is very low and hot, and few ferns occur there. The central and western portions, away from the coast, consist of a tableland with an elevation of about 600 meters, largely given over to agriculture. Above this plateau rise many isolated volcanoes and one or two mountain ranges. The lower slopes of the mountains, which would naturally be of great interest botanically, are devoted to coffee growing, the natural vegetation having thus become almost obliterated. Upon the higher slopes of the mountains there still remain, as already mentioned, certain areas of natural forest. Here there are more abundant rainfall and a relatively luxuriant vegetation, the trunks of the closely set trees being covered with mosses, ferns, orchids, and other epiphytes. It is this region which will best repay future exploration.

In general, however, ferns are not a conspicuous feature of the vegetation in Salvador, and as a rule not very many species are to be found in a given locality. The most productive localities visited were the mountain ravines about Ahuachapán, in the extreme western part, and the high slopes of the Volcano San Vicente, near the center of the Republic. At these places a number of rare and interesting species were collected. At lower altitudes the species are mostly those of wide distribution in the American tropics, and consequently of minor interest.

One who associates tree ferns with ideas of tropical vegetation would be disappointed in Salvador, since these handsome plants are of rare occurrence. It is probable that they were more plentiful formerly, before the general removal of the forest cover, and that their disappearance has resulted from the destruction of a suitable habitat.

In the following list collectors' numbers are cited only for the rarer or more interesting species.

CERATOPTERIDACEAE.

Ceratopteris pteridoides (Hook.) Hieron.

Abundant in the Lake of Maquigüe (60 meters), in eastern Salvador, floating in shallow water at the edge of the lake and in ditches.

SCHIZAEACEAE.

Anemia hirsuta (L.) Swartz.

Vicinity of San Salvador, on open banks; occasional at 650 to 850 meters altitude.

Anemia phyllitidis (L.) Swartz.

Rather frequent in the central and western departments, at 350 to 1,400 meters altitude; on stream banks, in forest, or on shaded brushy slopes.

Anemia sp.

Vicinity of San Salvador (*Calderón* 918). Perhaps new; consisting of several large, detached, fully fertile fronds, with triangular-ovate leafy blades 15 cm. long and nearly 10 cm. broad, the pinnae 1.5 cm. broad and closely, shallowly, and obliquely lobed. The alliance is with *A. hirsuta* and *A. jaliscana* Maxon.

Lygodium polymorphum (Cav.) H. B. K.

Very common at low and middle elevations, and ascending well up into the mountains (1,000 meters); climbing in hedges or thickets. The vernacular names are *crepillo* and *palmera*, and medicinal properties are attributed to the plant.

Cyathea mexicana Schlecht. & Cham.

Sierra de Apaneca, Department of Ahuachapán, along stream in forest (*Standley* 20199). Vernacular name *pescadillo*.

Portions of a young sterile plant, referred to this species with doubt. The curved acicular spines of the stipe are 5 to 7 mm. long, a development never seen in mature plants of *C. mexicana* and very likely due to youth. The pinnae are atypical in several particulars also, apparently owing to the excessive vigor of the rapidly growing plant.

Hemitelia costaricensis (Klotzsch) Mett.

About San Salvador a few juvenile plants are found in deep quebradas (Standley 9168), and the species is sometimes seen in cultivation in gardens. At Tonacatepeque specimens were taken from a cultivated plant. This had a slender trunk 2 meters high, and was said to have been obtained in the mountains near by. Tree ferns are very rare in Salvador. A few were seen in the mountains near Ahuachapán, on a cliff where it was impossible to reach them.

Cibotium guatemalense Reichenb.

The record is based upon specimens said to have come from the upper slopes of the Volcano of San Salvador (Calderón 688). The tops of the trunks, with the undeveloped leaves, are covered with a silky mass of long, soft, golden, threadlike scales that suggest hair or fur. These trunks are brought to the market of San Salvador, where, under the name *micos* ("monkeys"), they are sold for use as decorations in the houses and churches. Large quantities were upon sale the Third of May, the Day of the Cross, a festival during which there is erected in every home a cross, which is decorated with flowers and other ornamental objects.

POLYPODIACEAE.

Acrostichum sp.

Large plants of one of the species of *Acrostichum*, probably *A. aureum* L., were seen in an inaccessible location in the swamp at Ateos.

Elaphoglossum revolvens (Kunze) C. Chr.

Sierra de Apaneca, on tree trunk (Standley 20172).

Vittaria lineata (L.) J. E. Sm.

Pendent on tree trunks, Volcano of San Vicente, at 1,500 meters altitude.

Loxogramme salvinii (Hook.) Maxon.

On tree trunk, Volcano of San Vicente, at 1,500 meters altitude (Standley 21561). Known otherwise from eastern Guatemala and the mountains of western Panama.

Polypodium furfuraceum Schlecht. & Cham.

On trees, San Salvador, at 650 to 800 meters altitude. The vernacular name, *hierba de centupié*, is said to be explained by the fact that the leaves are bound upon centipede stings to relieve the pain.

Polypodium plebeium Schlecht. & Cham.

On a shaded rock, Volcano of San Vicente, at 1,500 meters altitude (Standley 21545).

Polypodium plumula Humb. & Bonpl.

On trees, central and western departments, chiefly in mountain forests, but occurring also about San Salvador. It is a fairly common species, ranging from 650 to 1,500 meters elevation.

Polypodium polypodioides (L.) Watt.

Rather common upon trees in the mountains at 1,000 to 1,500 meters elevation.

Polypodium brasiliense Poir.

A single collection: San Salvador (*Calderón* 839).

Polypodium lowei C. Chr.

On a shaded rock, Volcano of San Vicente, at 1,500 meters (*Standley* 21568). In this and similar large species of *Polypodium* the leaves wither and fall during the dry season, and at that period only the naked chaffy rootstocks are to be seen. The present specimen is in poor condition, yet shows clearly the anomalous venation well known to characterize this species.

Polypodium plesiosorum Kunze.

San Salvador (*Calderón* 1286); Colina de Santa Tecla (*Calderón* 1788); Izalco (*Calderón* 1711). The specimens are referred to this species in its usual inclusive sense. They are ample and well fruited.

Polypodium sanctae-rosae (Maxon) C. Chr.

Volcano of San Vicente, on tree trunk, at 1,500 meters (*Standley* 21484). An interesting extension of range. This species was described from Guatemalan specimens and has since been reported from southern Mexico.

Polypodium angustifolium Swartz.

Common in the central and western departments, chiefly in the mountains, but abundant about San Salvador, the altitudinal range being from 600 to 1,500 meters. The large masses of pendent leaves are very frequent upon shade trees in coffee plantations.

Polypodium xalapense (Fée) Christ.

Sierra de Apaneca Colina de Santa Tecla, and Volcano of San Vicente; upon mossy tree trunks and upon a moist bank in deep shade; altitude 1,000 to 1,500 meters.

Polypodium astrolepis Liebm.

Sierra de Apaneca, on tree trunk; vicinity of San Salvador, on trees and coffee bushes. In Salvador this is a mountain species, ascending to 1,000 meters. It is probably common, but the fronds during the dry season are shriveled and thus are easily overlooked.

Polypodium angustum (Humb. & Bonpl.) Liebm.

Common on tree trunks in mountains of the central departments, at 800 to 1,800 meters elevation.

Polypodium aureum L.

A single collection: Volcano of San Salvador, at about 1,500 meters, on tree trunk (*Standley* 22948a).

Adiantum andicola Liebm.

Volcano of San Vicente, in moist forest at 1,500 meters (*Standley* 21541).

Adiantum concinnum Humb. & Bonpl.

Perhaps the most common fern of Salvador, abundant in many localities, chiefly at middle altitudes, especially on the high perpendicular shaded banks of volcanic ash which border many of the roads. The vernacular name is *pie de zanate*. A decoction of the plant is said to be given to women after parturition.

Adiantum fruticosum Kunze.

Ahuachapán, in coffee plantation, at 1,000 meters altitude (*Standley* 19844). In the absence of authentic material of this species and *A. tetraphyllum* Humb. & Bonpl. the identification of the present specimen is doubtful. Under the latter name are roughly grouped several fairly well-marked regional forms of tropical North America, each with attendant variations correlated with habitat, age, and fertility.

Adiantum philippense L.

Near Finca San Nicolás (*F. Choussy*). Merrill has shown that this name, published in 1753, must be taken up for the present plant, which has commonly been called *A. lunulatum* Burm., 1763. The species is not uncommon in the drier lowlands of Panama and is at least locally abundant in parts of Central America, especially in western Nicaragua. It is one of the few ferns truly common to the tropics of both hemispheres.

Adiantum macrophyllum Swartz.

Occasional in the central and western departments, on moist shaded banks at 500 to 1,000 meters altitude.

Adiantum patens Willd.

A single collection: San Salvador (*Calderón* 1186).

Adiantum poiretii Wikstr.

Volcano of San Salvador, on moist shaded bank at 1,500 meters altitude (*Standley* 22889).

Adiantum trapeziforme L.

Sierra de Apaneca, in forest; vicinity of San Salvador, on banks along streams, at 650 to 850 meters elevation. Vernacular name, *culantrillo* (Sierra de Apaneca).

Adiantum trapezoides Fée.

Common, especially in the central departments, at 1,000 meters altitude or less; on river banks or dry or moist slopes; abundant along roadsides in some localities. Vernacular name, *pie de zanate*. An extremely well marked species, now known to range from Mexico throughout Central America to Colombia.

Cheilanthes intramarginalis (Kaulf.) Hook.

Open banks about the crater rim, Volcano of San Salvador, at 1,800 meters.

Cheilanthes angustifolia H. B. K.

Pine forest, Cerro Roblar, Dept. Chaltenango (*Calderón* 2476).

Hemionitis palmata L.

Near Ahuachapán, in a deep wooded ravine, at 800 to 1,000 meters altitude (*Standley* 19894).

Hemionitis pinnatifida Baker.

San Salvador (*Calderón* 1273).

Doryopteris concolor (L. & F.) Kuhn.

Two collections: Izalco (*Calderón*).

Notholaena brachypus (Kunze) J. Sm.

Abundant locally in the central and eastern departments, on dry open slopes or on rocks at 60 to 500 meters altitude. The fronds are shriveled during the dry season, but unfold after the first rains.

Pellaea skinneri Hook.

A single collection: Izalco (*Calderón*).

Pityrogramma calomelaena (L.) Link.

Common in many places at middle altitudes, usually on open banks; abundant by roadsides.

Pityrogramma peruviana (Desv.) Maxon.

Abundant on dry open banks of loose gravel about San Vicente, altitude 350 to 500 meters (*Standley* 21659). Probably of wide distribution in Salvador.

Pteridium arachnoideum (Kaulf.) Maxon.

Cerro del Guayabal, at 1,440 meters altitude (*Calderón* 2008). The vernacular name is *pecho de caballo*.

Pteridium caudatum (L.) Maxon.

Abundant in dry pine forest near Santa Ana, the plants 1 to 2 meters high; common on the rim of the crater of the Volcano of San Salvador; a common weed in coffee plantations on the Volcano of San Vicente; at 900 to 1,800 meters. Vernacular names, *palma* and *crespillo*. Variable, and perhaps not all properly referred to this species.

Pteris biaurita L.

San Salvador and Tonacatepeque, on moist shaded banks, at 650 to 1,000 meters altitude; frequent.

***Pteris grandifolia* L.**

San Vicente, on a wet stream bank at 400 meters; plants very large and conspicuous.

***Pteris quadriaurita* Retz.**

Common in the central and western departments, on moist banks or in forest, at 700 to 1,200 meters elevation.

***Pteris kunzeana* Agardh.**

A single collection: Izalco, on shaded stream bank (*Standley* 21876).

***Pteris mexicana* (Fée) Fourn.**

A large and showy plant, in the big swamp at Ateos (*Standley* 23345).

***Trismeria trifoliata* (L.) Diels.**

San Vicente, on rocky river bank; San Marcos, on moist open banks of white volcanic ash. Its altitudinal range is from 350 to 800 meters.

***Asplenium formosum* Willd.**

On a shaded bank near San Vicente, and in a cafetal near Ahuachapán; 500 to 1,000 meters altitude.

***Asplenium fragrans* Swartz.**

On tree trunks, Sierra de Apaneca, Colina de Santa Tecla, and Volcano of San Vicente, at about 1,500 meters. The plants have a delicate and characteristic fragrance.

***Asplenium hastatum* Klotzsch?**

Volcano of San Vicente; a single imperfect plant (*Standley* 21607), found upon a tree trunk.

***Asplenium praemorsum* Swartz.**

On tree trunks, Volcano of San Vicente, at 1,500 meters (*Standley* 21606).

***Asplenium standleyi* Maxon.**

Ahuachapán and Sierra de Apaneca, at 1,000 to 1,500 meters, growing on moist banks in forest.

***Asplenium* sp.**

Volcano of San Vicente, at 1,200–1,500 meters, on tree trunk (*Standley* 21574). Specimens imperfect; probably a new species, in the group of *A. lunulatum* Swartz.

***Asplenium virillae* Christ.**

Ahuachapán, on a moist shaded bank in ravine, at 1,000 meters altitude (*Standley* 19774.) This rare species was originally described from Costa Rica and has since been collected in the adjacent region of Chiriquí, western Panama. A Santa Marta specimen (*H. H. Smith* 2451) so referred by Christ is not this species.

Athyrium skinneri Moore.

Izalco (*Calderón*). Specimens are at hand from Mexico to Colombia. The species is particularly abundant in western Nicaragua.

Blechnum fraxineum Willd.

Found only once, growing in abundance upon a moist shaded bank in a quebrada or gully in the edge of San Salvador at 650 meters altitude (*Standley* 19589). This species, taken in its current sense, is undoubtedly an aggregate.

Blechnum occidentale L.

Common at middle and upper elevations, especially in the mountains; on shaded rocks and earth banks or in forest, at 800 to 1,500 meters. As represented in Salvador, the species is a variable one. One of the collections (*Standley* 21490) is a small hairy form, with narrow long-attenuate blades, sometimes referred to *B. glandulosum* Link.

Diplazium denticulosum (Desv.) C. Chr.

Collected at several localities in the central and western departments, at 350 to 900 meters elevation, growing on shaded stream banks, moist banks of quebradas, and in wet fields.

Diplazium franconis Liebm.

Ahuachapán, on moist shaded bank in ravine, altitude 1,000 meters (*Standley* 19773).

Diplazium donnell-smithii Christ.

Volcano of San Salvador, on moist bank in forest at 1,500 meters (*Standley* 22964; *Calderón* 458). Known previously from Honduras and eastern Guatemala.

Cyclopeltis semicordata (Swartz) J. Sm.

San Vicente, on shaded stream bank, altitude 350 meters (*Standley* 21739).

Dryopteris dentata (Forsk.) C. Chr.

San Vicente, Ateos, and Nahulingo, in wet thickets, from near sea level to 500 meters elevation. Vernacular name, *palmarín*.

Dryopteris equestris (Kunze) C. Chr.

Ahuachapán, on moist shaded slope of ravine, at 1,000 meters altitude (*Standley* 19758).

Dryopteris gongyloides (Schkuhr) Kuntze.

Ateos, in edge of swamp (*Standley* 23376).

Dryopteris nicaraguensis (Fourn.) C. Chr.

Ahuachapán, on moist bank in ravine, at 1,000 meters altitude (*Standley* 19770).

Dryopteris normalis C. Chr.

Ahuachapán, on shaded stream bank, at 1,000 meters elevation (*Standley* 20004). Apparently an uncommon plant in Salvador.

Dryopteris concinna (Willd.) Kuntze.

Cerro del Guayabal, at 1,400 meters altitude (*Calderón* 1994).

Dryopteris panamensis (Presl.) C. Chr.

Common in the central and western departments, at 500 to 800 meters elevation, on open banks or in moist thickets; often seen along roadsides. The vernacular name was given as *pescado de monte*, and a decoction of the plant was said to be given internally in the treatment of wounds.

Dryopteris patens (Swartz) Kuntze.

Common in the central and western departments, at 350 to 1,000 meters elevation, on shaded banks, in forest, or along streams.

Dryopteris subtetragona (Link) Maxon.

Collected in wet thickets at several localities in the central and western departments, at 200 to 600 meters altitude, but it is apparently scarce. Vernacular name, *palmera*.

Leptochilus cladorrhizans (Spreng.) Maxon.

San Vicente, in wet thicket; Ahuachapán, on moist bank in deep ravine. The altitudinal range is from 350 to 1,000 meters.

Polystichum distans Fourn.

Volcano of San Vicente, on moist bank in forest, at 1,500 meters altitude (*Standley* 21578). This is exactly the typical Mexican plant.

Polystichum ordinatum (Kunze) Liebm.

Volcanoes of San Salvador and San Vicente, and Sierra de Apaneca, in forest at about 1,500 meters elevation. Several collections, representing a characteristic form of this widely spread species.

Tectaria dilacerata (Kunze) Maxon.

Common in the central and western departments, on stream banks or moist shaded slopes, at 150 to 1,000 meters elevation. This species was originally described, as *Aspidium dilaceratum* Kunze, from cultivated material of Guatemalan origin. It is widely distributed in Central America and is represented by numerous specimens in most recent collections.

Tectaria heracleifolia (Willd.) Underw.

Common and widely distributed, along streams or on moist shaded banks, at 100 to 800 meters elevation.

Tectaria martinicensis (Spreng.) Copel.

Nahulingo, in wet thicket, at about 220 meters altitude (*Standley* 22035).

Dennstedtia adiantoides (Humb. & Bonpl.) Moore.

Ahuachapán and Sierra de Apaneca, in forest or on moist shaded banks; common, ascending to 1,000 meters.

HYMENOPHYLLACEAE.

Hymenophyllum myriocarpum Hook.

On tree trunk, Volcano of San Vicente, at 1,500 meters elevation (*Standley* 21584). The specimens are thoroughly characteristic.

Trichomanes kunzeanum Hook.

Sierra de Apaneca, scandent on tree trunks (*Standley* 20193, 20202). Probably best regarded as an extreme form of *T. radicans* Swartz.

SALVINIACEAE.

Azolla caroliniana Willd.

Santa Emilia, in an irrigation ditch; Ixtepeque, in the edge of a stream; San Martín; 135 to 400 meters. Vernacular names, *hierba del agua* and *doradilla*.

Salvinia auriculata Aubl.

Lake of Maquigüe, in eastern Salvador; the most abundant plant of the lake, occurring in great masses everywhere along the shores (*Standley* 20904). Laguna de Olomega, at edge of lake (*Standley* 21039). The vernacular name of the latter specimens was given as *cadenilla*.

EQUISETACEAE.

Equisetum giganteum L.

Ateos, abundant in the great swamp at this place. The old branched stems are 1 to 3 meters high, and form dense erect clumps, especially where supported by tree trunks.

LYCOPODIACEAE.

Lycopodium reflexum Lam.

A few small plants growing under *Fuchsia* bushes in a grassy thicket on the rim of the crater of the Volcano of San Salvador, at 1,800 meters (*Standley* 22807).

Lycopodium taxifolium Swartz.

Volcano of San Vicente, at 1,500 meters, pendent from tree trunks (*Standley* 21580). The plant, which was very scarce where collected, is said to be more common higher up on the volcano. It was grown in hanging baskets at a house upon the finca. Vernacular name, *riendilla*.

Lycopodium complanatum tropicum Spring.

Collected in the mountains of Ahuachapán by Dr. S. A. Padilla (no. 170), who gives the vernacular name as *periquito*.

SELAGINELLACEAE.

Selaginella cuspidata elongata Spring.

Very common in the central departments, at 350 to 800 meters, growing usually upon dry open banks. During the dry season the plants wither, but upon the advent of the rainy season put forth new fronds. Except for this species, *Selaginellas* appear to be very rare in Salvador.

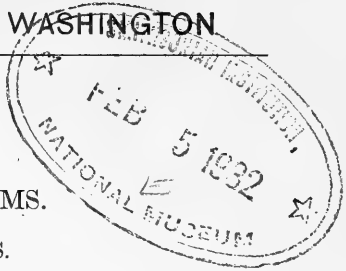
Selaginella hoffmanni Hieron.

Ahuachapán, on moist shaded bank in a ravine at 1,000 meters (*Standley* 19757).

Selaginella nicaraguensis Baker.

La Cebadilla (*Calderón* 1227). This species, which appears to be rare in collections, is extremely common in western Nicaragua.

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APHID HOMONYMS.

BY F. C. HOTTES.

The aphid homonyms contained in the following pages were taken from Wilson and Vickory's "Species List of the Aphididae of the World and their Recorded Food Plants" and Davidson's "A List of British Aphids." Liberal use has been made of certain of Davidson's comments regarding synonymy. In order to comply with the rule regarding homonyms it has been necessary to rename several species.

Lachnus abietis Walker 1848 (*Cinara*) has priority over *Lachnus abietis* Fitch 1851 which is a synonym of *Cinara pinicola* (Kaltenbach.)

Aphis acetosae Linne 1767 has priority over *Aphis acetosae* Buckton 1879. Linne and Buckton described the same species. According to Theobald *Aphis acetosae* may be the same as *Aphis rumicis* L.

Aphis alliariae Linne 1758 is incorrectly accredited to Koch in Koch's Die Pflanzenläuse Aphiden. Koch's *Siphonophora alliariae* has been given the name *Macrosiphum kaltenbachii* by Schouteden because Linne's species is also a *Macrosiphum*.

Aphis alni DeGeer (*Myzocallis*) 1773 has priority over *Aphis alni* Schrank (*Glyphina*) 1801. *Glyphina betulae* (Kaltenbach) replaces *Aphis alni* Schrank.

Aphis aparines Fabricius 1775 has priority over *Aphis aparines* Schrank 1801 and *Aphis aparines* Kaltenbach 1843. Fabricius and Schrank are generally considered to have had *Aphis rumicis* Linne. Kaltenbach's species is *Myzus cerasi* (Fabricius).

Aphis artemisiae Onomat. hist. nat. P. I. p. 506 (see Goetze 1778 p. 301) has priority over *Aphis artemisiae* Boyer de Fonscolombe (*Macrosiphoniella*) 1841, for which **Macrosiphum** (*Macrosiphoniella*) **basilicum** is suggested. *Siphonophora artemisiae* (*Macrosiphum*) Koch at one time belonged to the same genus and still does if the genus *Macrosiphoniella* is not recognized as a good genus. Ferrari called Koch's species *Siphonophora kochii*. *Aphis artemisiae* Passerini is the same as *Cryptosiphum artemisiae* Buckton. Cowen 1895 described *Nectarophora artemisiae*. Hunter has renamed this form *Nectarophora coweni* (*Macrosiphum*).

Aphis berberidis Kaltenbach (*Liosomaphis*) 1843 has priority over *Aphis berberidis* Fitch 1851. Fitch's species is also a synonym of the species described by Kaltenbach.

Aphis bicolor Haldeman 1844 has priority over *Aphis bicolor* Koch 1855. Neither species has apparently been recognized.

Aphis capsellae Koch 1855 is a homonym of a species described by Kaltenbach in 1843. Neither species has apparently been recognized.

Callipterus castaneae Fitch (*Myzocallis*) 1856 has priority over *Callipterus castaneae* Buckton. Baker has renamed Buckton's species *Myzocallis castinicola*.

Aphis cerasi Fabricius (*Myzus*) 1775 has priority over *Aphis cerasi* Müller 1776 and *Aphis cerasi* Schrank 1801. Fabricius and Müller are thought to have had the same species. Kaltenbach renamed the species described by Schrank *Aphis prunicola*.

Aphis chenopodii Schrank 1801 has priority over *Aphis chenopodii* Cowen 1895. Both species are probably synonyms of *Hyalopterus atriplicis* (Linne).

Aphis chrysanthemi Walker 1849 has priority over a species of the same name described by Koch in 1854. Walker's species is considered a synonym of *Aphis padi* L. Koch's species is according to Kaltenbach in all probability *Aphis cardui* L.

Aphis cinci Schrank 1801 has priority over *Aphis cinci* Williams 1911. The species described by Williams was redescribed by Gillette and given the name *Aphis torticauda*, a species since made the type of the genus *Bipersona*.

Aphis coryli Goetze (*Myzocallis*) 1778 has priority over *Aphis coryli* Mosley 1841. According to Davidson the species described by Mosley is *Capitophorus avellanae* (Schrank). Koch's *Callipterus coryli* is a synonym of the species described by Goetze.

Aphis crataegi Kaltenbach 1843 has priority over *Aphis crataegi* Koch; a species which will require a new name when recognized.

Aphis discolor Burmeister 1835 has priority over *Aphis discolor* Haldeman 1844. Neither species apparently has been recognized.

Aphis epilobii Kittel 1827, an apparently unrecognized species, has priority over *Aphis epilobii* Kaltenbach 1843, which requires a new name and *Aphis vetusta* is suggested.

Aphis eupatorii Passerini 1863 has priority over *Aphis eupatorii* Oestlund 1878 and the name *Aphis nostras* is suggested for it.

Aphis exual Walker 1849 has page priority over a species of the same name described by Walker in the same year. According to Davidson both descriptions refer to the same species.

Aphis euphorbiae Kaltenbach 1843 has priority over *Aphis euphorbiae* Walker 1849. Neither species has apparently been recognized.

Aphis gallarum Gmelin (*Cryptosiphum*) 1788 has priority over *Aphis gallarum* Kaltenbach 1856. The first synonym of Kaltenbach's species, not a homonym, is *Cryptosiphum artemisiae* Buckton.

Aphis heraclei Cowen 1895 is a homonym of *Aphis heraclei* Kaltenbach

1843. Davis has renamed the species described by Cowen, *Aphis heraclella*.

Aphis holci Hardy (*Brachycolus*) 1850 has priority over *Aphis holci* Ferrari 1872. The species described by Ferrari is still to be identified.

Aphis hordei Kyber (*Macrosiphum*) 1815 has priority over *Aphis hordei* Del Guercio 1913. Kyber never described his species, hence it is a nomen nudum. Davidson and Theobald consider Kyber's species to be *Macrosiphum granarium* (Kirby). It would appear that a species sufficiently characterized to be placed in synonymy is not a nomen nudum. Kaltenbach's *Aphis cerealis* is the same as *Macrosiphum granarium* (Kirby).

Aphis hordei Del Guercio 1913 requires a new name and **Aphis kyberi** is suggested.

Aphis juglandis Goetze (*Callipterus*) 1778 has priority over a species of the same name described by Blanchard in 1840. Blanchard's species is probably a synonym of the species described by Goetze. This species is often credited to Frisch, who described it prior to 1758. Goetze first used the name *juglandis* as a binomial and the species should be credited to him, as his usage has priority over both Gmelin 1788 and Kaltenbach 1843, authors generally credited with describing it.

Aphis lactucae Linne 1758 has priority over *Aphis lactucae* Schrank (*Myzus*) 1801 and *Aphis lactucae* Kaltenbach 1843. *Aphis lactucae* Kaltenbach has been renamed *Amphorophora cosmopolitana* by Mason. Linne's *Aphis lactucae* is said to be a *Macrosiphum*; it is more likely a *Myzus*, in which event *Aphis lactucae* Schrank (*Myzus*) besides being a homonym of the species described by Linne is also very likely a synonym of Linne's species. Should Linne's *Aphis lactucae* upon re-discovery prove different from *Myzus lactucae* (Schrank), Schrank's species will require a new name.

Lachnus laricis Hartig (*Cinara*) 1837 has priority over *Lachnus laricis* Walker 1848 and *Lachnus laricis* Koch 1857. Hartig did not describe his species other than to name the host upon which he found it. Hartig's name may therefore be considered a nomen nudum by some, in spite of the fact that the host and genus is sufficient to assure correct association in this case. In case Hartig's name is not accepted *Cinara laricifex* (Fitch) is the first name available. All names refer to the same species.

Aphis ligustri Mosley (*Rhopalosiphonius*) 1841 has priority over a species described by Kaltenbach in 1843 and given the same name. Kaltenbach's species is a synonym of the species described by Mosley, although the species is credited to Kaltenbach by Davidson and Theobald.

Aphis loniceræ Siebold (*Rhopalosiphonius*) 1839 has priority over *Aphis loniceræ* Boyer de Fonscolombe 1841, *Aphis loniceræ* Mosley and *Aphis loniceræ* Monell 1879. Boyer's species is apparently unknown. The species described by Mosley is a synonym of *Hyadaphis xylostei* (Schrank). The species described by Monell requires a new name and **Gyposaphis oestlundi** is suggested.

Aphis malvæ Mosley 1841 (*Macrosiphum*) has priority over *Aphis malvæ* Walker 1849 and *Aphis malvæ* Koch 1855. Walker's species will require a new name if found to be distinct from *Macrosiphum malvæ* Mosley. Koch's species is said to be a synonym of *Aphis gossypii* Glover.

Mosley's species is now known as *Macrosiphum pelargonii* (Kaltenbach). Walker in 1848 held Kaltenbach's species to be a synonym of *Aphis malvae* Mosley. Davidson holds the same view.

Aphis nerii Boyer de Fonscolombe 1841 has priority over a species of the same name described by Kaltenbach in 1843. The two species are not the same and I have seen no record of Kaltenbach's species in literature.

Aphis persicae Sulzer 1776 (*Myzus*) has priority over species described with the same name by Boyer de Fonscolombe in 1841, by Kaltenbach in 1843, and by Koch in 1854. Buckton renamed Boyer's species *Aphis amygdali*. Kaltenbach's species is in all probability *Aphis cardui* L. while Koch's species is very likely the same.

Aphis pilosa Haldeman 1844 has priority over *Aphis pilosa* Walker 1849 and *Aphis pilosa* Zetterstedt 1840. None of the above species has been recognized in literature.

Aphis plantaginis Goetze 1778 has priority over *Aphis plantaginis* Schrank 1801. The species described by Goetze has never been recognized. Since Schrank's name is a homonym and must be replaced it simplifies matters to declare it a synonym of the species described by Goetze rather than to give it a new name. This can be done for there is nothing in the original descriptions to distinguish the two forms.

Rhizobius poae Thomas 1879 has priority over *Rhizobius poae* Buckton 1883. Buckton renamed his species *Rhizobius graminis*; it is now placed in the genus *Geoica*.

Aphis polygoni Walker 1848 has priority over a species described with the same name by Van der Goot in 1912, for which the name *Aphis insons* is suggested. *Aphis polygoni* was also used by Macchati in 1885. The latter species has not been recognized.

Myzus potentillae Oestlund (*Macrosiphum*) has priority over a species given the same name by Williams in 1911. The species described by Williams is seriously involved in synonymy.

Aphis pruni Geoffroy 1762 has priority over *Aphis pruni* Scopoli 1763, *Aphis pruni* Fabricius 1775 and *Aphis pruni* Koch 1854. *Aphis pruni* Scopoli is the same as *Phorodon humuli* (Schrank) 1801. *Aphis pruni* Fabricius is recognized as a synonym of *Aphis arundinis* Fabricius 1775 (*Hyalopterus*). *Aphis pruni* Geoffroy must replace *Aphis arundinis* Fabricius unless Geoffroy's name can be rejected on the grounds that he was not consistently binomial. Koch's *Aphis pruni* is *Aphis cardui* L.

Aphis pyri Kittel 1827 has priority over *Aphis pyri* Hartig 1841, *Aphis pyri* Boyer de Fonscolombe 1841 and *Aphis pyri* Koch 1857. The species described by Kittel is *Aphis pomi* DeGeer. The species described by Hartig has not been recognized. Boyer's species is probably one of the more recently described species from apple, hence it very likely does not require a new name here. *Aphis pyri* Koch has been renamed *Aphis kochi* by Schouteden.

Aphis rhamni Boyer de Fonscolombe 1841 has priority over species described with the same name by Kaltenbach in 1843. Both species are the same.

Aphis ribis Linne (*Myzus*) 1758 has priority over *Aphis ribis* Müller 1776 and *Aphis ribis* Sanborn 1904. Linne and Müller very likely had the same species. Sanborn must have had a true *Aphis* which has since probably been described under another name.

Aphis rosarum Kaltenbach 1843 (*Capitophorus*) has priority over a species of the same name described by Walker in 1849. Walker's species is the same as that described by Kaltenbach.

Aphis rubicola Haldeman 1844 has priority over *Aphis rubicola* Oestlund 1887. If Oestlund's species is not a synonym of the species described by Haldeman the next available name is that of Dr. Patch, *Aphis rubiphila*.

Aphis salicis Linne 1758 (*Clavigerus*) has priority over *Aphis salicis* Sulzer 1776, *Aphis salicis* Müller 1776 and a species with the same name described by Curtis in 1800. The species described by Sulzer, Müller and Curtis is thought to be *Tuberolachnus saligna* Gmelin 1788, the first available name not a homonym.

Aphis saliceti Schrank 1801 (*Chaitophorus*) has priority over a species described with the same name by Harris in 1841. Uhler has renamed the species described by Harris *Lachnus salicicola*.

Aphis sambuci Linne 1758 has priority over *Aphis sambuci* Müller 1776, of which I find no mention in literature.

Aphis scabiosae Scopoli 1763 has priority over a species given the same name by Schrank in 1801. This name has always been credited to Schrank. The species described by Schrank is most likely the same as that described by Scopoli so there is no need for a new name.

Aphis senecionis Koch 1854 has priority over *Aphis senecionis* Williams 1911.

Macrosiphum trifolii Pergande 1904 has priority over a species given the same name by Theobald 1912. Davis has renamed Theobald's species *Macrosiphum theobaldii*.

Aphis sinensis Walker 1852 has priority over *Aphis sinensis* Del Guercio 1900, which requires a new name if it is not a synonym of the species described by Walker, which is highly improbable. Davidson and Theobald do not mention Walker's species.

Aphis solani Kittel 1827 has priority over *Aphis solani* Kaltenbach 1843. Koch's *Siphonophora gei* may be the same as *Aphis solani* Kittel. Kaltenbach's *Aphis solani* has been redescribed by Theobald and given the name *Macrosiphum pseudosolani*.

Aphis tuberculata Patch 1914 is a homonym of *Aphis tuberculata* Heyden 1837. The name *Aphis* (*Anuraphis*) *feminea* is suggested for the species described by Dr. Patch.

Aphis urticae Linne 1758 has priority over a species given the same name by Fabricius in 1775 and by Schrank in 1801. The species described by Fabricius and Linne have not been recognized. Schrank's species has been renamed *Macrosiphum schranki* by Theobald.

Aphis veratri Walker 1852 has priority over a species given the same name by Cowen in 1895. Cowen's species has not been recognized.

Aphis viburni Scopoli 1763 has priority over *Aphis viburni* Schrank 1801.

Theobald considers the two synonymous, Davidson considers them distinct.

Aphis viciae Fabricius 1781 has priority over *Aphis viciae* Kaltenbach (*Megoura*) 1843. According to Davidson the species described by Fabricius is a synonym of *Aphis craccae* L. Kaltenbach's species requires a new name and *Megoura bibula* is suggested.

Aphis verbasci Schrank 1801 has priority over a species given the same name by Boyer de Fonscolombe in 1841 which has not been recognized.

Aphis viminalis Hartig and a species given the same name by Boyer de Fonscolombe were both described in 1841. Hartig's species has not been recognized, while Boyer's species is a synonym of *Tuberolachnus saligna* (Gmelin).

Aphis vitellinae Schrank 1801 (*Chaitophorus*) has priority over a species given the same name by Hartig in 1841. Hartig's species has not been recognized.

Aphis yuccae Lichtenstein 1884 has priority over *Aphis yuccae* Cowen 1895. The species Cowen described is thought to be a synonym of *Aphis helianthi* Monell.

Aphis xylostei DeGeer (*Prociphilus*) 1773 has priority over *Aphis xylostei* Schrank 1801. *Hyadaphis xylostei* (Schrank) requires a new name and *Hyadaphis mellifera* is suggested.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE NAME *CINARA* VERSUS THE NAME *LACHNUS*.

BY F. C. HOTTES.

The following note concerning the use of the proper generic name for a genus in the family Aphididae also offers an opportunity to describe an apparently new species belonging to the genus under discussion and to record some notes on taxonomy which according to my information have not been published.

Through the failure of Aphidologists to recognize the first type fixation for the genus *Lachnus* as valid, the name *Lachnus* has been associated with a group of aphids generically at variance with the first type selected. This error has resulted in the use of the generic name *Pterochlorus*, which must now be recognized as a synonym of *Lachnus*. Schumacher (1921) clearly established the fact that *Aphis roboris* Linne was the correct type of the genus *Lachnus* by quoting from the second edition of Burmeister's *Handbuch der Entomologie*, page 1006, wherein Burmeister states that his *Lachnus fasciatus* is a synonym of *Aphis roboris* Linne, the type set for *Lachnus* by Westwood in 1840. Since 1921 the name *Lachnus* has been used incorrectly by English and American workers presumably because Schumacher's paper has not had wide circulation. The fact that certain workers consider the type of the genus *Cinara* to be *Aphis roboris* Linne instead of *Aphis pini* Linne, the type indicated by Curtis when he described the genus *Cinara* has also added to the confusion concerning the correct use of the two generic terms. Theobald and Laing 1929 (*Theobald, British Aphids*, vol. III, p. 352) take the following stand: "The point is simply this, Curtis defines the genus *Cinara* and describes and figures *roboris*. Unfortunately he says typical species *Aphis pini* Linnaeus? It was obvious, therefore, he knew nothing about *pini* and that what he had in mind for his genotype was what he was figuring and describing, namely *roboris*. It is my contention that you can not base genera on species you do not know and that in nomenclature you must interpret what a man obviously meant." That Curtis was familiar with *Aphis pini* Linne is evident from what he says on the page following the page on which the genus *Cinara* was described, from which we make the following quotation: "Nos. 20 to 30 enumerated in the Guide with the exception of No. 29 belong to this genus." Referring to the Guide

we find that *Aphis pini* Linne is number 22. Thus *Aphis pini* Linne is the correct type for the genus *Cinara*. Börner (1930) gives the generic synonymy of the genus *Cinara* to date.

Cinara fornacula, n. sp.

Apterous viviparous female.—Average length from vertex to tip of anal plate 2.87 mm. General color uniform light pea-green. Entire body and legs very lightly but uniformly pulverulent. Antennae, with the exception of the extreme apical portion of the sixth segment which is dusky-brown, yellowish. Beak with the three apical segments brown, remaining segments yellowish to light-dusky. Femora and tibiae pale yellowish-brown, apical portions of tibiae darkest, tarsi dark brown. Area around base of cornicles concolorous with rest of abdomen or pale brownish.

Head and appendages: Proportional lengths of antennal segments as follows: III 24–30 ave. 28, IV 16–17, V 21–27 ave. 23, VI 14–16+3. There are no secondary sensoria. The third, fourth and fifth antennal segments each with a primary sensorium, these are lacking on some segments and are always difficult to see. Eyes with small lateral tubercles. The beak extends well beyond the metathoracic coxae. Second segment of the hind tarsae exclusive of claws longer than the third antennal segment. Base of cornicles rather narrow about .22 across.

This species on a slide suggests very strongly *Cinara occidentalis* (Davidson) from which it may be separated by the legs and antennae being distinctly more hairy, and by the presence of ocular tubercles. Living specimens have considerably less pulverulent matter than *Cinara occidentalis*, and never occur in such large groups, for specimens almost always occur solitary.

Type apterous viviparous female taken on specimen Blue Spruce at Crookston, Minnesota, July 7, 1925, by F. C. Hottes. Paratypes same data as type, and Henning, Minnesota, June 25, 1926, on Spruce by C. E. Mickel. I have taken a single specimen of this species in Northern Colorado but I have not seen the mounted slide.

Type in the collection of Dr. O. W. Oestlund.

TAXONOMIC NOTES.

Mordwilko in 1895 recognized a species under the name of *Lachnus nudus* DeGeer. DeGeer never used the name *nudus* as a binomial, indicating and using the name thus: *Aphis (nuda Pini)*, etc. *Aphis nuda pini* DeGeer was made a synonym of *Aphis pini* Linne by Goeze in 1778. This step was hardly necessary except as a matter of record, for DeGeer so regarded it. DeGeer changed the name of the species described by Linne as *Aphis pini* so as to better distinguish it from another species on the same host (which was not known to Linne) which he called *Aphis (tomentosa pini)*, etc. The name *nudus* was therefore incorrectly accredited to DeGeer. Mordwilko thus becomes the author of the species *Cinara nudus*. *Cinara nudus* has been considered a synonym of *Cinara pini* Linne, but incorrectly so, for specimens

sent me and determined as such by Mordwilko differ from *Cinara pini* L. which Mordwilko determines and calls *Lachnus pineti* Koch.

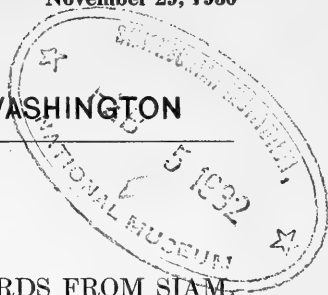
The name *tomentosa pini* was first correctly used as a binomial by Villers in 1789. This, however, was eight years after Fabricius had named the species *Aphis pineti*. The name *Schizolachnus pineti* (Fabricius), therefore, is the correct name for the species now known as *Schizolachnus tomentosa* (DeGeer).

The species *Hyalopterus pruni* has been incorrectly credited to Fabricius. Fabricius credited Geoffroy with being the author of the species *Aphis pruni* when he first used the name in his *Systema Entomologiae*.

The species described by DeGeer have always been considered as having been described as binomials. This is not the case, unless the following typical example can be so interpreted: "*Aphis (Pomi)*, flavoviridis, corniculis longioribus, pedibus antennisque nigrescentibus. Pomi." Fortunately however most of the species thus named were indicated as binomials in the index. The binomial name in the index is then the first application of a valid name to the description. The page of the index should therefore be considered the page on which the species was described. Unfortunately, however, *Aphis (Alni)*, etc., and *Aphis (Gallarium Ulmi)*, etc., were not indicated as binomials in the index, *Aphis (Alni)*, etc., being indicated as *Aphis tuberculata alni*, while *Aphis (Gallarium Ulmi)* etc., was indicated in the index the same as in the text. The first valid use of *alni* as a binomial is that of Goeze 1778, p. 316, who incorrectly credited DeGeer with being the author of the species. *Aphis (Gallarium Ulmi)*, etc., has been renamed *Tetraneura ulmifoliae* by Baker. *Aphis (salicis farinosa)*, etc., which is indicated as a binomial in the index, is a synonym of *Aphis salicis* Linne, a species of which it is also a homonym.



PROCEEDINGS
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DESCRIPTIONS OF THREE NEW BIRDS FROM SIAM.

BY J. H. RILEY.¹

Dr. Hugh M. Smith has recently presented the U. S. National Museum with another large collection of birds from Siam. There are a number of species and forms in the consignment not recorded from Siam before, quite a number being related to or identical with forms recently described from French Indo-China. One of the most startling is a fine male specimen of *Oriolus mellianus* from Kao Sabab, Chantaboon, eastern Siam, which was originally described from Kwangtung, China, and more recently has been taken in Kwangsi and Cambodia. The following three species are apparently new and are herewith described:

Arborophila diversa, sp. nov.

Type, adult male, U. S. National Museum, No. 324093, Kao Sabab, Chantaboon, Southeastern Siam, January 8, 1930. Collected by Hugh M. Smith (original No. 3630).

Similar to *Arborophila cambodiana* Delacour and Jabouille, but the head brussels brown, the occiput and nape only a little brighter, the hind-neck like the mantle, not black, the back evidently not so heavily barred with black; the under tail-coverts not buffish-chestnut but with a sub-terminal white band and a narrow blackish border; lower breast with the tips of the feathers hair brown, not chestnut.

Description.—Crown brussels brown with a few small dusky tips to the feathers; nape and a narrow band on hind-neck auburn, hardly noticeable; forehead, lores, and a narrow superciliary running back to the hind-neck band, russet on the lores, but fading posteriorly to tawny; eye-lids and a post-ocular stripe blackish; ear-coverts tawny with a few fine dusky tips to the feathers; chin tawny; throat with the bases of the feathers tawny, narrowly edged with blackish, the black increasing on the lower throat in width and depth of color, the tawny bases showing through on the upper throat but not so noticeable on the lower throat; back dresden brown, the

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mantle with narrow terminal bars of black, the rump and upper tail-coverts edged with cinnamon-brown; upper breast russet with a few narrow white shaft streaks, mostly concealed; lower breast hair brown with a little russet tinge, the feathers with a large white hastate spot, bordered above and below with blackish, some of the feathers vermiculated at the tips with dusky; belly white with wood brown borders, and sub-terminal bases to the feathers; the feathers of the sides hair brown with a russet tinge, the shaft and a large hastate sub-terminal spot white, bordered above with black and tipped with a rather wide border of the same color, the general effect being white barred irregularly with black; lower flanks buckthorn brown, some of the feathers with a large sub-terminal white spot and dusky tips, some of the feathers with only a white shaft streak and a black spot on the inner web, some with only a black sub-terminal spot, and some unicolor; under tail-coverts russet irregularly barred with black, the tips of the feathers widely white, fringed with dusky, the general effect being white edged with dusky; primaries fuscous black, the longer feathers narrowly edged externally at the tips and tipped with mikado brown; secondaries like the primaries, but more broadly bordered with mikado brown, the inner ones with a cinnamon mark at the tip on the outer web and the border becoming russet, the borders of all being vermiculated with black; the tertials largely russet with a rather large sub-terminal light brownish olive spot bordered anteriorly with a narrow band of irregular black markings; scapulars light brownish olive with a rather large black mark mostly on the inner web, the tips of the longer feathers russet; lesser wing-coverts light brownish olive narrowly bordered with black, some of the feathers with a narrow border of russet on the inner web; greater wing-coverts similar to the secondaries; tail prouts brown with irregular dusky markings. Wing, 143; tail, 61; culmen, 20; tarsus, 42; middle-toe, 35.5 mm.

Remarks.—Only the type was taken. No specimens of *Arborophila cambodiana* are available for comparison, but the present bird does not agree with the description of that species, though evidently closely allied.

***Garrulax ferrarius*, sp. nov.**

Type, adult male, U. S. National Museum, No. 324311, Kao Kuap, near Krat, Southeastern Siam, December 27, 1929. Collected by Hugh M. Smith (original No. 3577).

Similar to *Garrulax milleti* Robinson and Kloss from south Annam, but the head and throat clove brown, only black on the lores, ear-coverts and chin; the breast deep quaker drab without the light border to the jugulum, the deep quaker drab of the upper back extending up the neck to the nape without a white collar; only sides of the neck behind the ear-coverts white; and the sides and flanks more extensively olive-brown. Wing, 124; tail, 116; culmen, 25.5; tarsus, 41; middle-toe, 25 mm.

Remarks.—Two males were taken at the type locality on the same day. The style of coloration is the same as *Garrulax milleti*; the principal difference being the lack of the white collar and light grayish border to the jugulum and the brownish head of *Garrulax ferrarius*.

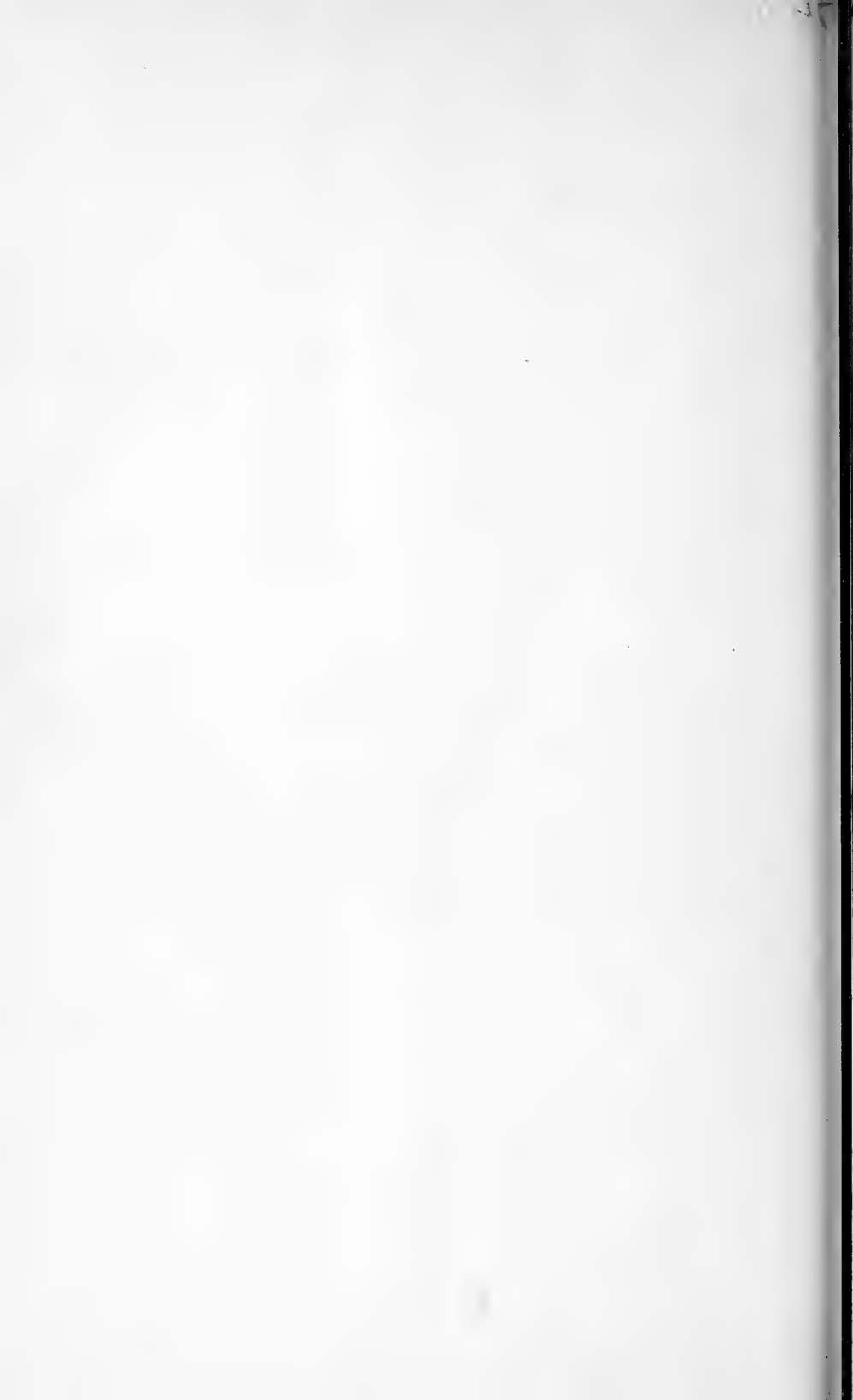
Dicaeum umbratile, sp. nov.

Type, adult male, U. S. National Museum No. 324672, Kao Kuap, near Krat, Southeastern Siam, December 24, 1929. Collected by Hugh M. Smith (original No. 3562).

Similar to *Dicaeum beccarii* Robinson and Kloss, but lighter below, the sides of the breast with a black line on each side as in *Dicaeum ignipectum*.

Description.—Upper surface dusky green-blue; cheeks and sides of neck dark mouse gray; below cream buff, a little deeper on the chest and abdomen; a narrow black line on each side of the chest and another black line down the center of the abdomen; flanks light yellowish olive; primaries olivaceous black with a green metallic wash on the exposed part of the closed wing. Wing, 47; tail, 23.5; culmen, 10 mm.

Remarks.—Only the type secured. The present species is much like *Dicaeum ignipectum*, but has a longer bill, is entirely without any scarlet on the chest, is lighter below, and the black lines on each side of the chest are narrower and not so pronounced. Delacour and Jabouille (Bull. Brit. Orn. Club, 48, 1928, p. 135) have described *Dicaeum beccarii cambodianum* from Bokar, Cambodia, as "similar to *D. beccarii* but paler below with a longer bill." They say nothing of a black line on each side of the chest and it is presumed their type is without it. The absence of the black line on each side of the chest and the absence of scarlet on the chest separates *D. beccarii* from *D. ignipectum*.



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PROCEEDINGS
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BIOLOGICAL SOCIETY OF WASHINGTON



ON A NEW SPECIES OF BROOK SILVERSIDE,
LABIDESTHES VANHYNINGI, FROM FLORIDA.

BY BARTON A. BEAN AND EARL D. REID.

In a small lot of fishes received for identification from the Florida State Museum, Gainesville, Florida, there are a few examples of a brook silverside which we propose to describe as new under the name

Labidesthes vanhyningi.

The differences between this and the more northern form are quite apparent, the body more slender; less compressed, snout shorter, about equal to the large eye, which is contained two and two-thirds in head, the latter being one-fourth of the standard body length; depth of body seven and one-third in length; maxillary reaching eye; curvature of the gape being much more pronounced than in *Labidesthes sicculus*; lower jaw slightly projecting; pectoral reaching past base of ventral, which reaches vent; dorsal origin opposite first ray of anal; anterior ray of dorsal and anal equal in length to depth of body; those of anal forming a slight lobe; the margin being somewhat concave; last dorsal ray when depressed reaches a point opposite the insertion of last anal ray; extending much farther back than in *Labidesthes sicculus*. Depth of caudal peduncle equal to diameter of eye; caudal forked. Gill-rakers longer than filaments, twenty on the lower part of anterior arch.

Dorsal IV. 11; anal 1, 23; scales, 72.

Color in spirits pale, translucent, without the silvery reflections so constant in *Labidesthes sicculus*; the lateral line band is, however, well marked with a narrow black band above and below connecting with caudal peduncle to form an indistinct caudal spot; edge of scales above lateral band punctulated with small dark spots, which become dense on top of head and body; a dark area wide as pupil surrounds the snout and mandible in front of nostril, most distinct on snout, in corners of mouth, and under lower jaw; minute brown specks form lines on each side of nape above opercle, surrounding light areas about size of pupil; similar lines along each side of ventral region, running from base of ventral fin to caudal,

forming a dark area along base of anal fin; rays of vertical fins with dark punctulations; membranes colorless.

The type, number 88485 of the U. S. National Museum, and number 41780 of The Florida State Museum, were collected in Prairie Creek, Florida, six miles east of Gainesville, January 20, 1927, by O. C. Van Hyning, Curator of Reptiles and Fishes of The Florida State Museum. It is fifty-eight millimeters long, and we take pleasure in naming it for the collector. Three paratypes in the same lot are forty, forty-three and forty-five millimeters long. Four additional specimens (number 41779 of The Florida State Museum), were taken in Lake Warburg, Florida, October 27, 1923.

There were five specimens in the type lot; cotypes in The Florida State Museum.

Three specimens, number 44276, were taken in Knapaha Lake, Alachua County, Florida, April 5, 1929, and three specimens, number 43900 in a sink at Arredonda, Alachua County, Florida, May 29, 1930. The Florida State Museum catalogue numbers.

4.0673

PROCEEDINGS
OF THE
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A NEW SPECIES OF PLEUROTHALLIS FROM
MEXICO.

BY OAKES AMES AND CHARLES SCHWEINFURTH.

Among specimens of plants recently collected on Socorro Island off the west coast of Mexico, the following species of *Pleurothallis* appeared and proved to be new. One other orchid was found, namely *Cattleya aurantiaca* (Batem.) P. N. Don, a species now known to be widely distributed in Mexico and Central America, but heretofore unrecorded from Socorro Island.

Pleurothallis unguicallosa, A. & S. sp. nov.

Herba parvula, epiphytica, rhizomate et radicibus densissime intertextis. Rhizoma repens. Caules secundarii graciles, monophylli. Folium lanceolato-ellipticum, in siccitate coriaceum. Racemi quam folium multo breviores, laxe pauciflori. Sepala lateralia in laminam ovatam acriter bidentatam connata. Sepalum dorsale oblongo-oblancoelatum, mucronatum, concavum. Petala minuta, oblanceolato-lineararia, abrupte acuta. Labellum unguiculatum, hastato-oblongum, ungui calloso; lamina supra dense papillosa. Columna arcuata, superne utrinque triangulerialata.

Plant small, forming dense mats on tree-trunks. Rhizome creeping, slender, branching, concealed by scariosus evanescent sheaths, closely jointed and marked by dark rings. Roots very numerous, fibrous, flexuous, filiform, glabrous. Stems slender, subapproximate, up to 4.9 cm. long, spreading, 1-jointed near the base, enveloped to above the middle by 2 tubular scariosus sheaths of which the upper one is much the longer. Leaf apical, solitary, elliptic to lanceolate-elliptic, about 4-5.5 cm. long and 8-12 mm. wide, minutely bilobed and apiculate at the apex, cuneate at the sessile base, coriaceous, mid-nerve more or less sulcate above and conspicuously carinate beneath, apparently fleshy in the living plant. Racemes axillary, much shorter than the leaf, 1-4 to a stem, up to 4-flowered, subtended by a small scariosus conduplicate broadly lanceolate spathe. Floral bracts minute, infundibuliform, scariosus, acute. Flowers small, apparently dark-colored. Sepals rather fleshy in texture. Lateral sepals obliquely lanceo-

late, connate into an ovate lamina which is sharply bidentate at the apex; lamina about 5 mm. long and 5 mm. wide below the middle, saccate at base, 6-nerved, sharply bicarinate on the outer surface with the keels prolonged into a mucro. Dorsal sepal oblong-ob lanceolate, 5.2-5.5 mm. long, about 2 mm. wide, concave, 3-nerved, uncarinate on the outer surface, similarly mucronate, basal margins somewhat connate with the lateral sepals. Petals minute, obliquely oblanceolate-linear, membranaceous, about 3 mm. long, abruptly acute, upper margins irregular, 1-nerved. Labellum much shorter than the sepals, recurved, simple, clawed, 3.2 mm. long; claw subquadrate, slightly angled on each side near the base, adorned near its apex with a transverse fleshy callus which is elevated-quadrate at its base and gradually tapers into the lower part of the lamina; lamina about 2.4 mm. long, in natural position abruptly dilated into auricles at base, gradually constricted in the middle with upcurved sides, and slightly dilated in front; when expanded the lamina is oblong-quadrate or oblong-lanceolate, indistinctly bicarinate near the center, acute at the rounded apex, anterior margins denticulate, upper surface studded with approximate papillae. Column arcuate, shorter than the petals, winged with the wing triangular-dilated at the summit on each side, extended into a stout subequally long foot. Anther galeate; pollinia 2, complanate-pyriform.

The description was made from a tangled mass of dried plants, in which the flowers appeared to be either immature or far advanced. The name is in allusion to the prominent callus at the apex of the claw.

Pleurothallis unguicallosa has its nearest ally in *P. Wilsoni* Lindl., a species which occurs in Cuba, Jamaica, Haiti, Porto Rico and Guadeloupe. The West Indian species, however, is a smaller one throughout, with 1-flowered peduncles and dissimilar petals and lip.

MEXICO, Socorro Island (Revillagigedo Islands), *Herbert L. Mason 1628*, May 5, 1925. Epiphytic on tree-trunks on east slope of island. The leaves are said to be green above and purple beneath. Type in the Herbarium of the California Academy of Sciences. Duplicate type in the Herbarium of Oakes Ames No. 36528.

INDEX

New names are printed in **heavy type**.

A	Aphis alni	
Abama americana.....	54	aparines.....
Acalypha digyneia.....	29	artemisiae.....
Acer pseudo-platanus.....	39	berberidis.....
rubrum var. tridens.....	29	bicolor.....
saccharum var. nigrum.....	39	capsellae.....
Achirus lineatus.....	146	cerasi.....
Achnida tamariscina.....	38	chenopodii.....
Acrostichum sp.....	170	chrysanthemi.....
Adiantum andicola.....	172	cinei.....
capillus-veneris.....	23	coryli.....
concinnum.....	172	crataegi.....
fructuosum.....	172	discolor.....
macrophyllum.....	172	epilobii.....
patens.....	172	eupatorii.....
philippense.....	172	exual.....
poiretii.....	172	euphorbiae.....
trapeziforme.....	172	feminea
trapezoides.....	172	gallarum.....
Agastache scrophulariaefolia.....	32	heraclei.....
Agelena intermedia	143	holci.....
oquirrhensis	142	hordei.....
Agrimonia pubescens var. bicknel- lii.....	38	insons
Agrostis canina.....	36	juglandis.....
schweinitzii.....	23	kyberi
Albright, H. M. Some Biological Problems in National Park Ad- ministration.....	viii	lactucae.....
Albula vulpes.....	145	ligustri.....
Alsine stricta.....	38	loniceriae.....
Althaea rosea.....	30	malvae.....
Alyssum alyssoides.....	27	nerii.....
Ambystoma californiense.....	56	nostras
gracile.....	56	persicae.....
macrodactylum.....	56	pilosa.....
Amelanchier canadensis var. inter- media.....	28	pineti.....
laevis.....	28	plantaginis.....
micropetala var. poto- macensis.....	29	polygoni.....
sanguinea.....	28	pruni.....
sera.....	28	pyri.....
Ames, Oakes, and Charles Schweinfurth. A New Species of Pleurothallis from Mexico.....	195-196	rhamni.....
Ampelopsis arborea.....	44	ribis.....
Anagallis arvensis var. caerulea.....	32	rosarum.....
Anchoviella choerostoma.....	146	rubicola.....
filifera.....	146	saliceti.....
Andropogon scoparius var. villo- sissimus.....	23	salicis.....
Aneides ferreus.....	60	sambuci.....
flavipunctatus.....	60	scabiosae.....
lugubris.....	61	senecionis.....
Anemia hirsuta.....	169	sinensis.....
karwinskyana.....	82	solani.....
phyllitidis.....	169	tuberculata.....
sp.....	169	urticae.....
Anemone canadensis.....	43	veratri.....
Antennaria solitaria.....	52	verbasci.....
Anthemis tinctoria.....	46	vetusta
Anthracothorax pinchoti	7	viburni.....
Apargia autumnalis.....	46	viciae.....
Aphis acetosae.....	179	viminalis.....
alliariae.....	179	vitellinae.....
		xylostei.....
		yuccae.....
		Apocynum androsaemifolium.....
		Aralia spinosa.....
		Arborophila diversa
		Archosargus unimaculatus.....
		Ariseema psillum.....
		Aristida curtissii.....
		gracilis var. depauperata.....

198 *Proceedings of the Biological Society of Washington.*

Aronia melanocarpa.....	43, 54	Blake, S. F. Note on the Domestic Turkey.....	x
Artemisia vulgaris.....	46	— A New Polygala from Colombia and Bolivia.....	5-6
Aruncus sylvester.....	54	— A New Polygala from Bermuda.....	161-162
Ascyrum stans.....	51	— Two New Asteraceae from Mexico Collected by Georges Woronow.....	163-166
Ashbrook, F. G. Fur Farming in Europe.....	x	Blechnum fraxineum.....	175
Asplenium ebenoides.....	47	— occidentale.....	175
— formosum.....	174	Botrychium obliquum var. elongatum.....	22
— fragrans.....	174	Brasenia schreberi.....	50
— hastatum.....	174	Bromus hordeaceus var. leptotachys.....	23
— leucothrix.....	85	— maximus.....	36
— praemorsum.....	174	Bryant, H. C. Fancy and Fact in Natural History.....	x
— standleyi.....	85, 174	Bufo californicus.....	75
— virillae.....	174	— canagicus.....	61
Aster azureus.....	40	— canorus.....	62
— dumosus var. cordifolius.....	34	— cognatus.....	73
— ericoides var. platyphyl- lus.....	34	— halophilus.....	62
— villosus.....	41	Bupleurum rotundifolium.....	31
— laevis var. cyaneus.....	40		
— lateriflorus var. pendulus.....	34	C	
— lucidulus.....	40	Cabomba caroliniana.....	43
— novae-angliae.....	52	Callipterus castaneae.....	180
— novi-belgii var. elodes.....	40	Caltha palustris.....	54
— paniculatus var. acuti- dens.....	41	Camptosorus rhizophyllus.....	47
— simplex.....	34	Camptostoma ridgwayi.....	129
— puniceus var. firmus.....	40	Cardamine parviflora var. areni- cola.....	38
— salicifolius.....	41	Carex aquatilis.....	48
— vimineus var. dubius.....	34	— bullata.....	43
Astyanax integer.....	67	— caryophylla.....	24
Atherina harringtonensis.....	146	— communis var. wheeleri.....	37
Athyrium angustum.....	23	— conjuncta.....	42
— sciatraphis.....	85	— davisii.....	48
— skinneri.....	174	— gynandra.....	48
Avena altior.....	96	— mirabilis.....	24
— suffusca.....	95	— plantaginea.....	24
Azalea arborescens.....	31	— tribuloides var. sangamonensis.....	24
— atlantica.....	31	— typhina.....	43
— rosea.....	32	Carya glabra var. hirsuta.....	26
— viscosa, variety.....	31	— ovalis Wang. var. odorata.....	26
Azolla caroliniana.....	177	Castalia tuberosa.....	38
		Catalpa bignonioides.....	54
B		Ceanothus americanus.....	54
Bailey, V. Some Biological Prob- lems of the Grand Canyon Region.....	viii	Celtis occidentalis var. pumila.....	38
Ball, H. Capture of a Baird Sand- piper at Alexander Island, Virginia.....	x	Cenchrus pauciflorus.....	36
Banisteria anoptera.....	159	— tribuloides.....	36
— argyrophaea.....	159	Centaurea vochinensis.....	46
— mossii.....	157	Cephalopholis fulvus.....	147
— suberosa var. candolleana.....	158	Cetengraulis edentulus.....	146
Bartonia paniculata.....	51	Chaemepelia navassae.....	149
Bartsch, P. Collecting in the Caribbean Islands.....	viii	Chaerophyllum procumbens var. shortii.....	31
Batrachoseps attenuatus.....	57	Chaetochloa ambigua.....	23
— leucopus.....	58	— geniculata var. perennis.....	36
Bean, Barton A., and Earl D. Reid. On a New Species of Brook Silverside, Labidesthes vanhyningi, from Florida.....	193-194	Chaetodon capistratus.....	148
Betula lenta.....	54	Chaetostomus anomalus.....	69
Bidens aristosa var. fritcheyi.....	35	Chamaesyce hirsuta.....	39
— mutica.....	35	Chamberlin, Ralph V., and Willis J. Gertsch. On Fifteen New North American Spiders.....	137-144
— bidentoides.....	53	Chapin, Edward A. New Species of Halipilus Latr. (Col.).....	9-12
— connata.....	46	Charax metae.....	69
— frondosa var. anomala.....	35	Cheilanthes angustifolia.....	173
Bignonia radicans.....	52	— intramarginalis.....	173
Blake, S. F. Note on the Observa- tion of Gulls on the Washington Airport.....	viii	Chelone glabra var. ochroleuca.....	32
— Note on the Persistent Greenness of Grass on large Ant Hills.....	ix	— obliqua.....	33

200 *Proceedings of the Biological Society of Washington.*

Eleocharis obtusa var. jejuna.....	37
olivacea.....	42
Elodea occidentalis.....	23
Elymus.....	24
striatus var. villosus.....	36
Ensatina eschscholtzii.....	58
sierrae.....	59
Epigaea repens.....	53, 54
Epilobium coloratum var. umbrosum.....	39
Equisetum giganteum.....	177
Eragrostis hagerupii.....	92
Erigeron pusillus.....	34
Eriocaulon parkeri.....	24
Eryngium aquaticum.....	45
Erysimum.....	50
Erythronium albidum.....	48
Estebrooke, L. M. The Inter-American Conference on Agriculture.....	x
Eucnostomus gula.....	148
Eupatorium album var. subvenosum.....	34
aromaticum var. melisoides.....	40
purpureum.....	52
serotinum.....	46
urticaefolium var. villicaule.....	34
Ewing, H. E. Two New Generic Names and Three New Species of Mallophaga.....	125-128

F

Farlowella acus.....	70
Ficus carica.....	49
Field, G. W. Note on the Pollution by Oil of Wild Bird Reservations.....	ix
Filix fragilis.....	23
Fowler, Henry W. Notes on Tropical American Fishes.....	145-148
Francolinus atrifrons.....	3
Fraxinus caroliniana.....	32
Fuirena squarrosa.....	37
Fulvetta insperata.....	123

G

Galinsoga caracasana.....	46
Galium mollugo.....	33
pilosum var. puncticulosum.....	33
verum.....	33
Garrulax eous.....	79
ferrarius.....	190
laetus.....	134
Gaultheria procumbens.....	53, 54
Gentiana clausa.....	32
Geranium bicknellii.....	29
dissectum.....	44
Gerres havana.....	148
rhombeus.....	148
Gertsch, Willis J. (See Chamberlin and Gertsch.)	
Geum canadense var. grimesii.....	28
hirsutum.....	43
Gnaphalium obtusifolium var. helleri.....	34
uliginosum.....	52
Grindelia squarrosa.....	46
Grinnell, J., and J. M. Linsdale. Two New Foxes from the Southern California Islands.....	153-156
Gymnopogon ambiguus.....	47
Gypsophis oestlundii.....	181

H

Habenaria cristata.....	43
flava.....	49
Haemulon flavolineatum.....	148
sciurus.....	147
Haliphus crassus.....	12
cubensis.....	10
panamanus.....	11
philippinus.....	9
Hambleton, J. I. The Behavior of the Honey Bee.....	x
Haplocalymma woronowii.....	163
Harengula anchovia.....	145
maculosa.....	145
Helenium tenuifolium.....	35
Helianthus.....	53
angustifolius.....	53
hirsutus.....	41
microcephalus.....	41
Heliopsis scabra.....	41
Heliotropium europaeum.....	45
Hemibrycon metae.....	68
Hemionitis palmata.....	173
pinnatifida.....	173
Hemiramphus unifasciatus.....	146
Hemitelia escuquensis.....	82
costaricensis.....	170
Heracleum lanatum.....	45
Heuchera pubescens.....	27
Hicoria ovata.....	54
Hieracium marianum.....	40
Higgins, E. Great Lakes Investigations.....	vii
Hitchcock, A. S. Nomenclature at the International Botanical Congress.....	x
Fifteen New Species of Grasses, Six from Africa, Nine from China.....	89-96
Holocentrus ascensionis.....	146
Hordeum pusillum.....	42
Hottes, F. C. Aphid Homonyms. The Name Cinara Versus the Name Lachnus.....	179-184
The Name Cinara Versus the Name Lachnus.....	185-188
Hydaphis mellifera.....	184
Hydrangea arborescens var. oblonga.....	27
Hyla arenicolor.....	63
regilla.....	63
Hymenophyllum myriocarpum.....	177
Hypericum virgatum.....	30
Hypochaeris radicata.....	46
Hypolepis ekmani.....	84
pulcherrima.....	84
Hypopitys insignita.....	31

I

Ibidium plantagineum.....	43
Ilex glabra.....	39
opaca.....	53, 54
Ilysanthes.....	51
dubia var. inundata.....	33
Impatiens balsamina.....	30
Iresine rhizomatosa.....	43
Iris cristata.....	54
verna.....	54
virginica.....	25
Isoetes riparia.....	36
saccharata var. reticulata.....	35
Isotria affinis.....	26

J

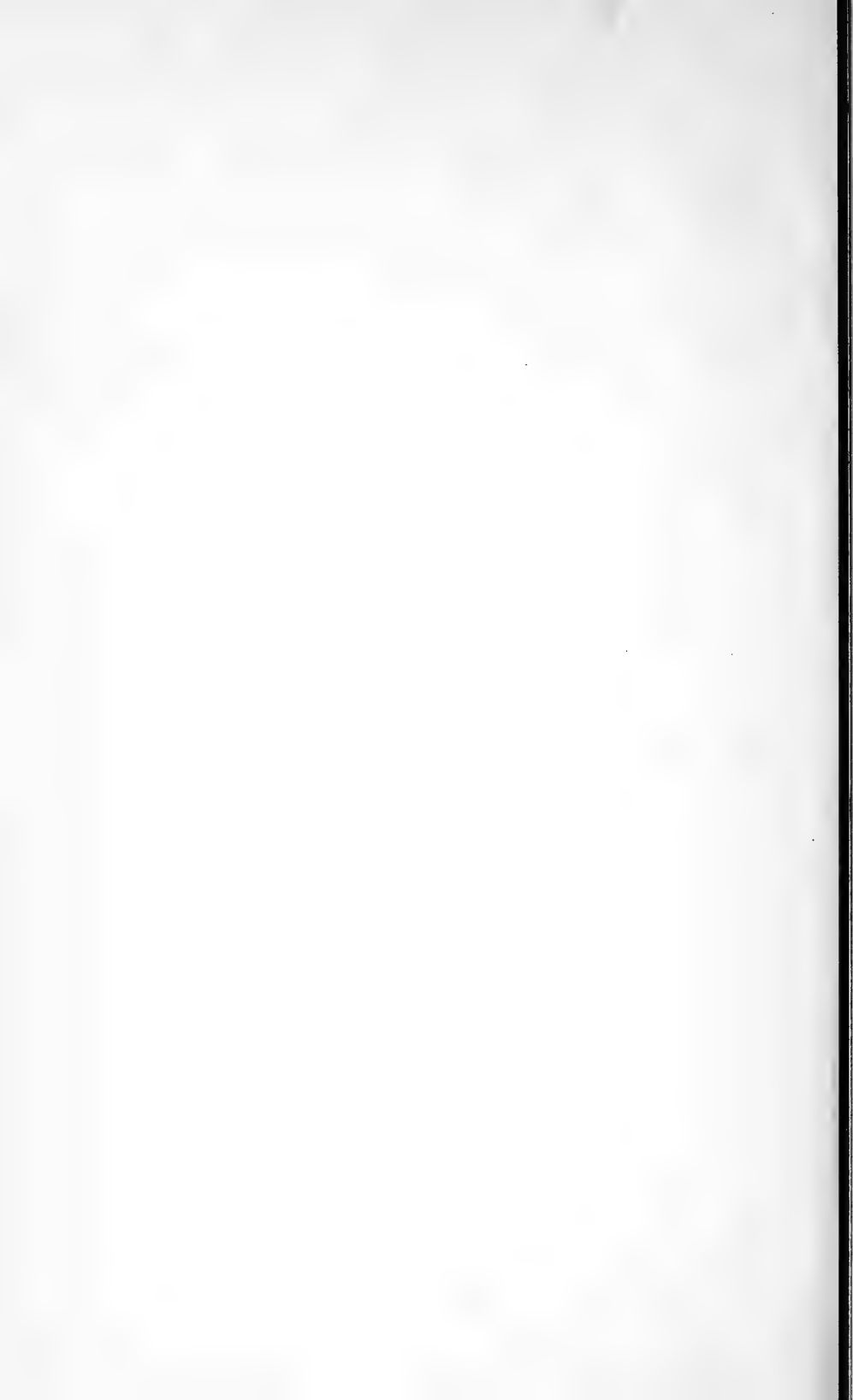
Jeffersonia diphylla.....	50
Jenkinsia stolonifera.....	145

Palmer, T. S. Note on the Lifting of the Embargo on Parrots.....	x	Polypodium xalapense.....	171
Panicularia obtusa.....	42	Polystichum acrostichoides var. schweinitzii.....	23
Panicum addisoni.....	42	distans.....	176
angustifolium.....	36	ordinatum.....	176
glaucofolium.....	90	Populus balsamifera.....	26
nigerense.....	90	Potentilla reptans.....	38
scoparium.....	47	Prenanthes altissima.....	33
spretum.....	41	Prunus armeniaca.....	39
wernerii.....	41	cuneata.....	50
Parabanisteria	157	instititia.....	39
Parodon apolinari	66	virginiana.....	54
Parthenium hysterophorus.....	34	Pteridium arachnoideum.....	173
Payson, Edwin Blake, and Harold St. John. The Washington Species of Draba.....	97-122	caudatum.....	173
Pedicularis lanceolata.....	45	latiusculum var. pseudo-caudatum.....	35
Pellaea atropurpurea.....	54	Pteris biaurita.....	173
skinneri.....	173	grandifolia.....	174
Pennisetum molle.....	91	kunzeana.....	174
Peters, H. S. External Parasites of Birds.....	viii	mexicana.....	174
Philadelphus coronarius.....	27	quadriaurita.....	174
Phlox subulata.....	32	Pygidium kneri.....	69
Phruonellus.....	137	Pyrola elliptica.....	45
californicus.....	139		
floridae.....	139	Q	
formidabilis.....	137	Quercus lyrata.....	37
minnetonka.....	139	macrocarpa.....	49, 54
pelvicolens.....	138		
pictus.....	138	R	
Phrurolithus.....	140	Radicula hispida.....	43
kentuckyensis.....	141	obtusa.....	50
mateonus.....	141	Rana boylei.....	63
mormon.....	140	catesbeiana.....	64
tejanus.....	142	draytonii.....	63
Phyllostachys mitis.....	24	luteiventris.....	63
Physalis philadelphica.....	39	muscosa.....	64
Picea abies.....	23	sierrae.....	64
Picris echioides.....	33	Ranunculus delphinifolius.....	26
Pimpinella saxifraga.....	31	parviflorus.....	27
Pinus echinata.....	47	Reddington, P. G. Alaska and Some of Her Interesting Inhabitants.....	ix
pungens.....	54	Reid, Earl D. (See Bean and Reid.)	
strobilus.....	47	Reseda lutea.....	27
taeda.....	47, 54	Rhamdia quelen.....	69
Pityrogramma calomelaena.....	173	Rhexia mariana.....	51
peruviana.....	173	Rhizobius poae.....	182
Platypsaris richmondi.....	130	Rhododendron maximum.....	45, 53, 54
Platystemon californicus.....	27	Rich, W. H. Alaska Salmon Investigations.....	vii
Pleurothallis unguicallosa.....	195	Riley, J. H. Two New Forms of Laughing Thrushes from Yunnan.....	79-80
Poa alta.....	93	A New Species of Fulvetta from Yunnan, China.....	123-124
debilior.....	93	Four New Forms of Birds from Szechwan, China.....	133-136
shansiensis.....	93	Descriptions of Three New Birds from Siam.....	189-192
tangii.....	94	Rosa carolina var. glandulosa.....	27
Poinsettia dentata.....	44	Rubus alleghaniensis.....	27
Polygala bermudensis.....	161	andrewsianus.....	28
macerrima.....	5	frondosus.....	28
Polygonatum commutatum var. virginicum.....	25	occidentalis forma pallidus.....	27
hebetifolium.....	25	odoratus.....	43
Polygonum aquale.....	26	phoenicolasius.....	28
dumetorum.....	38	trivialis.....	38
Polymnia canadensis var. radiata.....	41	villosus var. humifusus.....	38
Polypodium angustifolium.....	171	Rumex britannicus.....	38
angustum.....	171	Rynchospora axillaris.....	42
antillense.....	83	fusca.....	37
astrolepis.....	171		
aureum.....	171	S	
brasiliense.....	171	Sabbatia campanulata.....	49
fucoides.....	83	Salix alba var. vitellina.....	37
furfuraceum.....	170		
lowei.....	171		
plebeium.....	170		
plesiosorum.....	171		
plumula.....	170		
polypodioides.....	41, 53, 171		
sanctae-rosae.....	171		
vulgare.....	47		

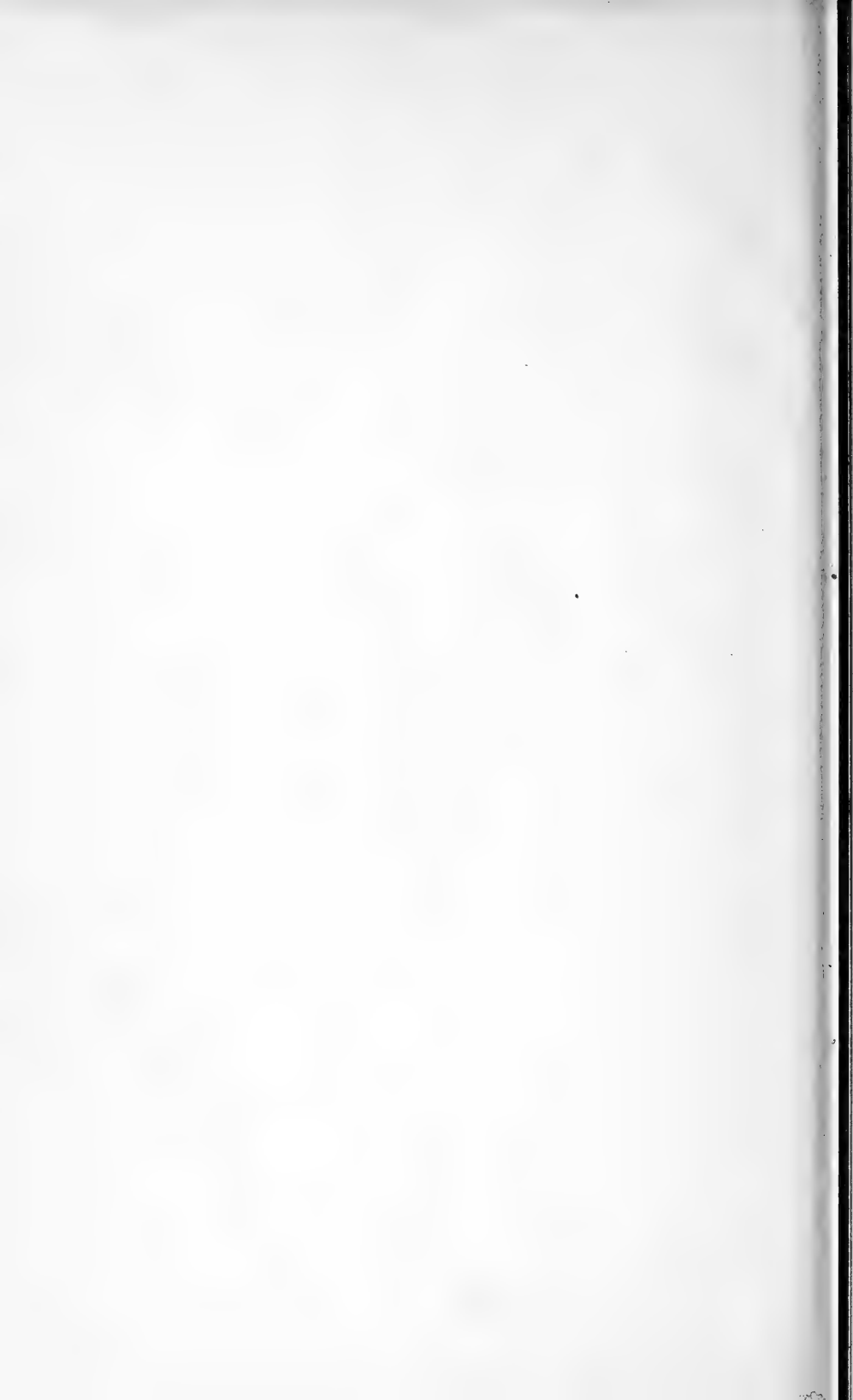
<i>Salix alba pentandra</i>	49	graphs of the Skull of <i>Sinan-</i>	
wardi.....	49	thropus <i>pekinensis</i>	viii
<i>Salvinia auriculata</i>	177	<i>Tilia michauxii</i>	30
<i>Sarracenia drummondii</i>	54	neglecta.....	30
flava.....	54	<i>Tithymalopsis marylandica</i>	50
purpurea.....	54	<i>Tithymalus pepulus</i>	29
<i>Saxifraga pennsylvanica</i>	27	<i>Trachelospermum difforme</i>	32
<i>Scandix pecten-venensis</i>	45	<i>Trapa natans</i>	44
<i>Scaphiopus hammondi</i>	61	<i>Trautvetteria carolinensis</i>	50
<i>Schizea pusilla</i>	54	<i>Trichiurus lepturus</i>	147
<i>Schmaltzia crenata</i>	44	<i>Trichomanes kunzeanum</i>	177
Schmitt, W. L. Exhibition of a		<i>Tridens flavus</i> variety.....	36
Rare Isopod.....	x	<i>Trimeria trifoliata</i>	174
Schreiner, O. Biological Science		<i>Triturus torosus</i>	55
in the East Indies.....	ix	<i>Tropaeolum majus</i>	29
Schweinfurth, Charles. (See Ames		<i>Tsuga canadensis</i>	53, 54
and Schweinfurth.)		<i>Tulipa sylvestris</i>	25
<i>Scleria pauciflora</i>	42		
var. <i>caroliniana</i>	42	U	
reticularis var. <i>pubescens</i>	42	Uchida	125
<i>Scutellaria serrata</i>	51	Urocyon dickeyi	154
<i>Selaginella cuspidata elongata</i>	178	santarosae	154
hoffmanni.....	178		
nicaraguensis.....	178	V	
<i>Selar crumenophthalmus</i>	147	Vaccinium pennsylvanicum	32
<i>Senecio obovatus</i>	46, 53	vacillans var. <i>crinitum</i>	32
vulgaris.....	46	Valerianella chenopodifolia	52
<i>Serranus mystacinus</i>	147	woodsiana.....	52
<i>Seticapsella cleistogama</i>	33	Van Rossem, A. J. The Sonora	
Sette, O. E. Mackerel Investiga-		Races of <i>Camptostoma</i> and <i>Platy-</i>	
tions.....	vii	<i>typsaris</i>	129-132
<i>Sisyrinchium angustifolium</i>	37	Veratrum viride	54
<i>Smilax glauca</i> var. <i>leurophylla</i>	25	Verbesina pterocarpa	164
Smith, H. M. Some New and		Veronica agrestis	40
Curious Siamese Fishes.....	x	anagallis-aquatica.....	33
<i>Solidago</i>	52	chamaedrys.....	45
altissima var. <i>procera</i>	40	scutellata.....	52
juncea var. <i>ramosa</i>	40	Viburnum nudum	54
scabrella.....	34	Vicia hirsuta	44
<i>Sonehus arvensis</i>	40	sativa.....	50
<i>Sophia pinnata</i>	27	Viola chinensis	30
Spencer, J. W. Observations on		hirsutula x <i>papilionacea</i>	30
Colorado Elk Herds.....	x	incognita.....	30
<i>Sphenopholis obtusata</i>	42	pedata.....	54
var. <i>pubescens</i>	23	Vitis labrusca	54
<i>Spherooides testudineus</i>	148	Vittaria lineata	170
<i>Spigelia marylandica</i>	45		
<i>Spiraea alba</i>	27	W	
salicifolia.....	38	Ward, Melbourne. Natural His-	
Standley, Paul C. (See Maxon		tory of the Barrier Reef of	
and Standley.)		Australia.....	x
St. John, Harold. (See Payson		Wanderings in North	
and St. John.)		Australia.....	xi
<i>Sternarchus leptorhynchus</i>	66	Warren, F. A. Along the Trails of	
Stiles, C. W. Is International		Mt. Rainier.....	viii
Zoological Nomenclature Prac-		Westover, H. L. Plant Explora-	
ticable? Report on Padua Con-		tions in Turkestan.....	ix
gress.....	xi	Wetmore, A. Receipt of Skins of	
<i>Stipa chingii</i>	94	Giant Panda at the National	
purpurascens.....	95	Museum.....	vii
<i>Stomosis juncea</i>	33	Note on Observation of	
<i>Strophostyles helvola</i> var. <i>mis-</i>		Mated Ducks.....	viii
souriensis.....	29	Note on Limits to be	
<i>Struthiopteris caudata</i>	86	Ascribed to the "Washington	
		Region".....	ix
T		Observation of Forster	
Tanacetum vulgare var. <i>crispum</i>	41	Tern in Maryland.....	ix
Taxodium distichum	54	The International Orni-	
Tectaria acutiloba	88	thological Congress.....	x
dilacerata.....	176	Note on the New Reptile	
heracleifolia.....	176	House at the Zoological Park... Results of Recent Study	x
martinicensis.....	176	of Pleistocene Bird Remains	
sodiroid.....	88	from Florida.....	xi
Tetraphthalmus transitans	125		
Thalictrum coriaceum	38		
Thlaspi arvense	50		
Thone, F. Exhibition of Photo-			

Wetmore, A. A New Hummingbird from St. Andrews Island, Caribbean Sea.....	7-8	Xanthium pennsylvanicum.....	34
The Ground Dove of Navassa Island.....	149-150	speciosum.....	34
Wiebe, A. H. Some Observations in Increasing Pond Productivity.....	viii	spinosum.....	33
Wolffiella floridana.....	24	Xanthoxalis corniculata var. langloisii.....	29
		Y	
X		Yucca filamentosa.....	25
Xanthium.....	33	Yuhina omeiensis.....	134
chinense.....	34	quarta.....	134
italicum.....	34		
		Z	
		Zanthoxylum americanum.....	50

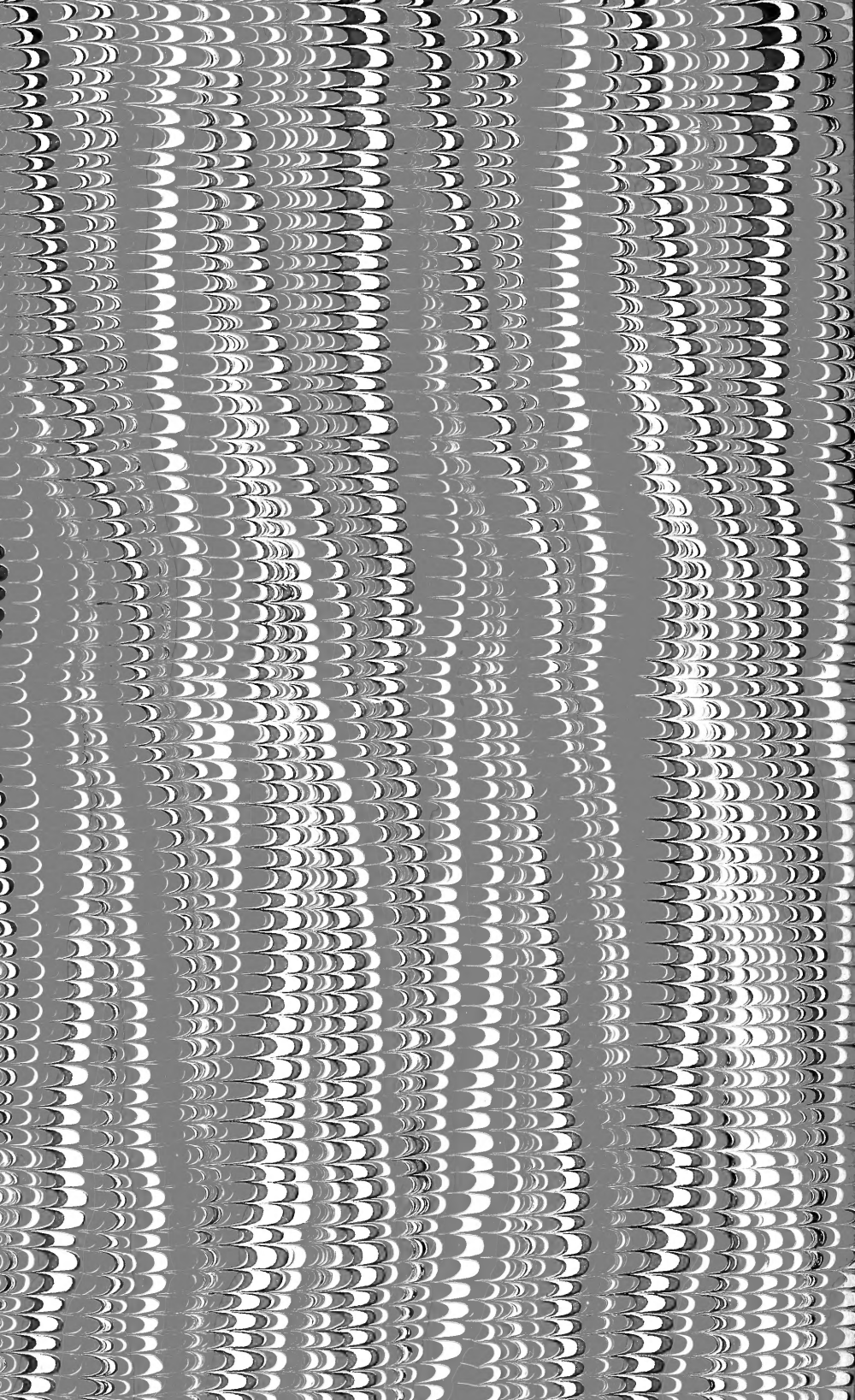


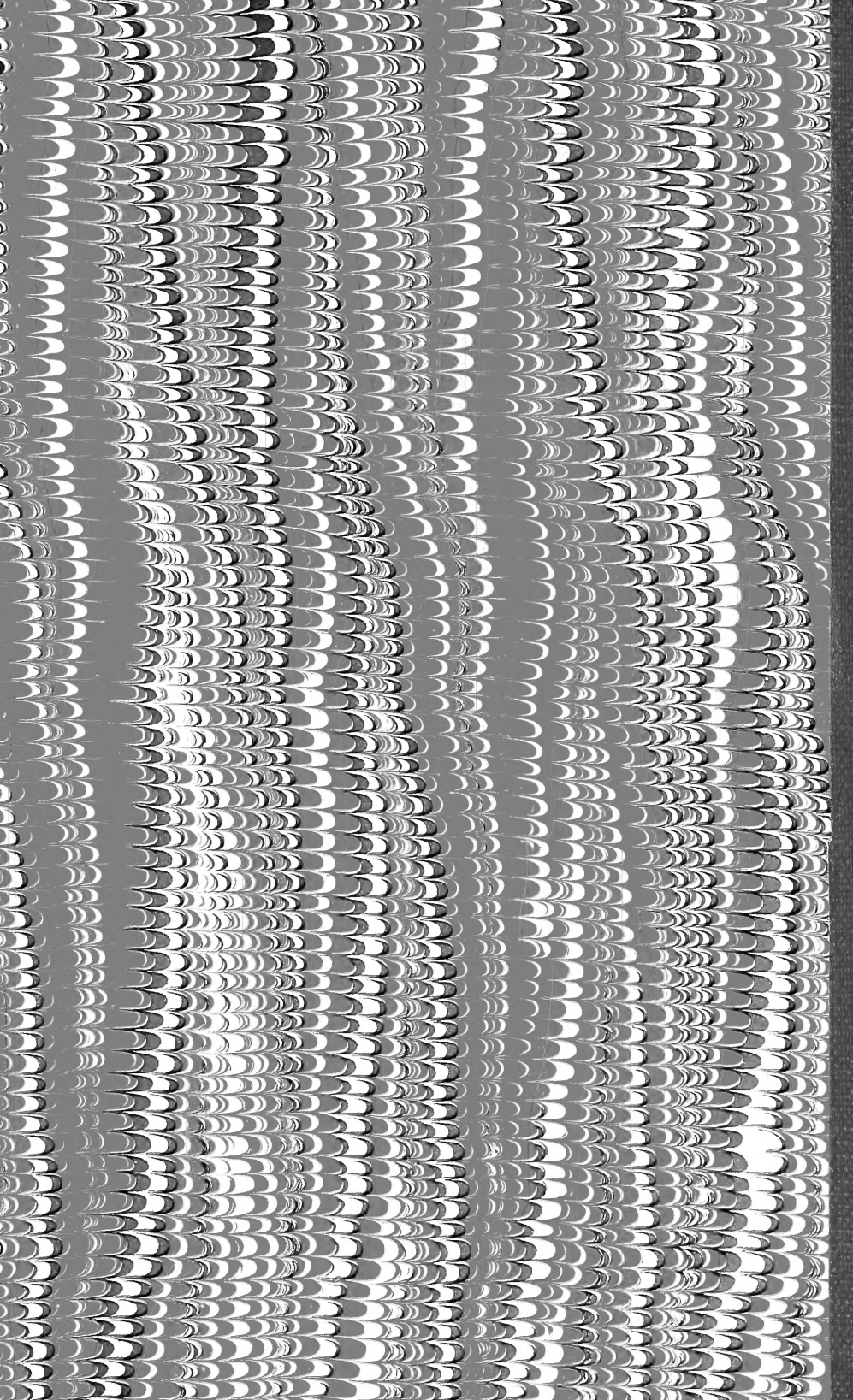












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