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PROCEEDINGS

OF THE



Biological Society of Washington

VOLUME 53
1940

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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 1940-1941)

(ELECTED MAY 18, 1940)

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The Committee on Publications declares that each paper of this volume was distributed on the date indicated on its initial page. The contents, minutes of meetings, and index for 1940 (pp. v-xi, 159-170) were issued on February 26, 1941. The title page and lists of officers and committees for 1940-1941 (pp. i-iv) were issued on February 26, 1941.

PLATES.

- Plate I, facing page 96. *Syrrhophus pipilans*, sp. nov. Type.
 Plate II, facing page 122. Palatal sesamoids and palatal teeth in *Cnemidophorus*.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS.

January 13, 1940—888th Meeting.

President Bell in the chair; 61 persons present.

Informal communications: F. Thone, Exhibition of new books;
M. B. Waite, Exhibition of botanical specimens.

Formal communications: V. Bailey, Kodachrome color records
of plants and animals; S. B. Fracker, From Acadia to Yosemite
with blister rust control.

January 27, 1940—889th Meeting.

President Bell in the chair; 60 persons present.

New member elected: John O'Brien.

Informal communications: F. Thone, Exhibition of new books;
M. B. Waite, Note on the scarcity of rabbits.

Formal communications: E. P. Walker, Eyes that shine at
night; H. O'Neill, Botanical exploration in the eastern Canadian
Arctic.

February 10, 1940—890th Meeting.

President Bell in the chair; 50 persons present.

Informal communications: T. Ulke, Note on nesting of great
horned owl; J. S. Wade, Exhibition of new books.

Formal communications: C. W. Thornthwaite, Relationship
of climate to vegetation; A. B. Gurney, Some giants and pygmies
in the insect world.

February 24, 1940—891st Meeting.

Vice-President Walker in the chair; 42 persons present.

New member elected: F. W. Poos.

Informal communications: F. Thone, Exhibition of new books;

P. B. Johnson, Note on recent cases of tularemia; J. E. Shillinger, Note on catfish spines and deerflies as causes of tularemia; M. B. Waite, Note on delay to a fast train caused by a collision with turkey buzzards, and Note on effects of recent severe weather on vegetation.

Formal communications: F. C. Lincoln, Fluctuating bird populations in North America; H. H. T. Jackson, Fluctuating mammal populations in North America; O. E. Baker, Human population prospects and some biological implications.

March 9, 1940—892d Meeting.

President Bell in the chair; 59 persons present.

New member elected: R. M. Bailey.

Informal communications: M. B. Waite, Note on Catalpa; H. B. Humphrey, Notice of death of Oran L. Raber; W. B. Bell, Note on the release of Pacific coast mallard ducks in Maryland; J. S. Wade, Exhibition of new books.

Formal communications: J. O. Ware, Some biological developments in cotton culture in the United States; Adolph Murie, Wildlife in Mt. McKinley National Park, Alaska.

March 23, 1940—893d Meeting.

President Bell in the chair; 50 persons present.

Informal communications: T. Ulke, Notes on local plants and mammals; F. Thone, Exhibition of new books; M. B. Waite, Note on a moss.

Formal communications: C. E. Gillham, Birds of the western Arctic; A. M. Pearson, Mourning dove studies; A. S. Einarsen, Antelope management research in Oregon.

April 6, 1940—894th Meeting.

Vice-President Walker in the chair; 39 persons present.

Informal communication: F. Thone, Exhibition of new books.

Formal communications: H. L. Crane, Nuts and nut culture in the United States; V. Bailey, Caves and cave life.

April 20, 1940—895th Meeting.

President Bell in the chair; 65 persons present.

Informal communications: E. P. Walker, Note on cardinals feeding on forsythia buds; V. Bailey, Note on spring foods of gray squirrels.

Formal communications: S. H. Thompson, Seals of the Pribilof Islands; H. J. Deason, Our vanishing Great Lakes fishes.

May 4, 1940—896th Meeting.

Vice-President Walker in the chair; 45 persons present.

Informal communications: T. Ulke, Note on a polyerous trillium; Phoebe Knappen, Note on another specimen of the same; I. N. Hoffman, Note on hummingbirds in captivity; V. Bailey, Note on the food of gray squirrels; Phoebe Knappen, Note on birds that feed on elm seeds; E. P. Walker, Note on new animals at the National Zoological Parks.

Formal communications: Phoebe Knappen, Speaking of birds: some mechanical and physical devices helpful in telling school children about birds; W. R. Van Dersal, Some biological aspects of soil conservation.

May 18, 1940—897th Meeting.

SIXTY-FIRST ANNUAL MEETING.

President Bell in the chair; 16 persons present.

New member elected: Carlo Zeimet.

The reports of the Recording Secretary, Corresponding Secretary, Treasurer, Committee on Publications, and Committee on Communications were read. A report for the Trustees of Permanent Funds was presented.

The following officers and members of council were elected: President, E. P. Walker; Vice-Presidents, C. W. Stiles, J. E. Shillinger, Frank Thone, H. B. Humphrey; Recording Secretary, S. F. Blake; Corresponding Secretary, J. S. Wade; Treasurer, F. C. Lincoln; Members of the Council, I. N. Hoffman, J. E. Benedict, Jr., E. G. Holt, L. K. Couch, Paul B. Johnson.

October 5, 1940—898th Meeting.

President Walker in the chair; 70 persons present.

The deaths of Frank Bond, E. B. Calvert, Esther Hart, Arthur H. Howell, and R. W. Williams were noted.

Informal communication: F. Thone, Exhibition of new books.

Formal communications: L. G. Henbest, Kodachrome views of western landscapes; J. J. Lynch, The snow goose from the Mississippi delta to the delta of the Mackenzie.

October 19, 1940—899th Meeting.

President Walker in the chair; 23 persons present.

New members elected: Charles Debrovlny, W. R. Eadie, F. R. Fosberg, Benjamin Shreve, W. H. Stickel.

Informal communication: J. S. Wade, Exhibition of new books.

Formal communications: H. H. Stage, Mosquito control in the Pacific Northwest; C. P. Russell, The naturalist program of the National Parks.

November 2, 1940—900th Meeting.

President Walker in the chair; 80 persons present.

Informal communications: L. Stejneger, Recollections of early days of the Society; V. Bailey, Recollections of early days of the Society; C. E. Chambliss, Exhibition of a set of the publications of the Society; E. P. Walker, Results of the questionnaire regarding the Society's activities, and Exhibition of an ozone-producing machine for neutralizing animal odors.

Formal communications: P. S. Galtsoff, Fishing for sponges in Florida and the Bahamas; W. R. Van Dersal, The heritage we guard.

November 16, 1940—901st Meeting.

President Walker in the chair; 47 persons present.

Informal communication: F. Thone, Exhibition of new books.

Formal communications: R. K. Enders, Reproductive phenomena in the mink; W. B. Bell, Psyche W. Wetmore, F. C. Bishopp, Theora Plitt, R. H. Feidler, Symposium on new researches in biological science.

November 30, 1940—902d Meeting.

President Walker in the chair; 86 persons present.

New members elected: H. J. Cole, Alverta Dillion, G. L. Eadie, M. D. Mittelman.

Informal communications: F. Thone, Obituary notice of Raymond Pearl; J. S. Wade, Exhibition of new books; V. Bailey, Description of a squirrel cage; F. Thone, Notice of a mockingbird that can whistle like a policeman.

Formal communications: M. E. Musgrave, At home with mountain lions; F. M. Uhler, Poisonous snakes of the United States.

December 14, 1940—903d Meeting.

President Walker in the chair; 60 persons present.

The death of F. R. Wagner was announced.

New members elected: Ludwig Caminita, Jr., P. A. DuMont, J. P. Miller, Victor Scheller.

Informal communication: F. Thone, Exhibition of new books.

Formal communications: E. R. Coffey, F. C. Bishopp, J. E. Shillinger, H. A. Edson, H. W. Schoening, Symposium on A coordinated approach to biological problems: human diseases.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW SUBSPECIES OF THE CANYON MOUSE (*PEROMYS-
CUS CRINITUS*) FROM SONORA, MEXICO.

BY SETH B. BENSON,

Museum of Vertebrate Zoology, University of California.

Field work in northwestern Sonora in the past four years has brought to light the existence of a great amount of geographic variation in the canyon mice (*Peromyscus crinitus*) inhabiting that area. The extremes in paleness and darkness in this species occur between populations living only a few miles apart. A high degree of isolation, and great differences in the color of the rocky hills which this species inhabits, seem to be correlated with this geographic variation.

***Peromyscus crinitus delgadilli*, new subspecies.**

Type.—Adult male, skin and skull, no. 83042 Mus. Vert. Zool.; from 2 miles south of Crater Elegante, Sierra del Pinacate, 34 miles west of Sonoita, Sonora, Mexico; collected March 28, 1938, by Margarito Delgadillo; original number 4963 Seth B. Benson.

Distribution.—Limited to the Pinacate lava field in northwestern Sonora.

Diagnosis and comparisons.—A race characterized by dark color, long, unicolored dark tail, and dark hind feet. All of the other known subspecies have white feet and bicolored, or white, tails.

Color (capitalized color terms after Ridgway, Color Standards and Color Nomenclature, 1912).—Hair on dorsum with base Dark Plumbeous, narrow subterminal band Cartridge Buff, tip black. Lateral stripe and pectoral spot Light Buff. A faint buffy wash on some belly hairs which otherwise have white tips and Dark Plumbeous bases. Hairs of tail black. Hind feet black to base of toes. Skin of ears and hind feet dark-pigmented. The dark pigment is dominant in the general tone of color.

Measurements.—Average and extreme measurements in millimeters of 6 adult and subadult males: Total length, 182 (173-188); tail, 104 (94-115); hind foot, 20 (19-21); ear from notch, 20 (19-21); ear from crown, 17 (16-17); weight in grams, 12.1 (10.6-14.2); length of head and body, 79 (71-87). *Skull*: Greatest length, 23.7 (23.3-24.3); basilar length, 17.5 (17.0-18.0); zygomatic breadth, 11.3 (11.0-11.7); interorbital constriction, 4.0 (3.8-4.1); nasals, 9.1 (8.9-9.2); shelf of bony palate, 3.3 (3.2-3.4); palatine

slits, 5.1 (5.0-5.3); diastema, 5.9 (5.5-6.1); postpalatal length, 8.4 (8.2-8.7); maxillary tooththrow, 3.4 (3.3-3.5).

Specimens examined.—Total number, 8, all from the Sierra del Pinacate, Sonora, Mexico, as follows: Crater Elegante, 4; 2 miles south of Crater Elegante, 3; Batamote, Rio Sonoita, 30 miles WSW Sonoita, 1.

Remarks.—Seven of the eight specimens resemble each other closely, but one specimen from Crater Elegante is like the members of the population living on the Sierra Hornaday. This specimen may indicate either that isolation is not complete or that the population is not yet homozygous for dark color.

***Peromyscus crinitus rupicolus*, new subspecies.**

Type.—Adult female, skin and skull, no. 83034 Mus. Vert. Zool.; from Paso MacDougal, east end of Sierra Hornaday, Sonora, Mexico; collected March 25, 1938, by Seth B. Benson; original number 4944.

Distribution.—Probably restricted to the Sierra Hornaday.

Diagnosis and comparisons.—A dusky, long-tailed race. Differs from *P. c. disparilis* in darker color, more sharply distinct dark stripe on tail, and dusker ears. Subterminal band on dorsal hairs narrower, Pinkish Buff rather than Light Ochraceous-Buff. Black tipping on hairs more pronounced. Much paler than *delgadilli*.

Color.—Hair on dorsum with base Dark Plumbeous, narrow subterminal band Pinkish Buff, tip black. Hair of ventral surface with base Dark Plumbeous and tip white. Feet white. Tail bicolor, black above, white beneath. Skin of ears heavily pigmented.

Measurements.—Average and extreme measurements in millimeters of 4 males: Total length, 181 (175-188); tail, 105 (96-112); hind foot, 19; ear from notch, 20 (18-21); ear from crown, 17 (15-18); weight in grams, 11.5 (10.1-11.9); length of head and body, 71 (64-79). *Skull:* Greatest length, 23.6 (23.3-24.1); basilar length, 17.3 (16.9-17.6); zygomatic breadth, 11.3 (11.0-11.5); interorbital constriction, 3.9 (3.8-4.0); nasals, 9.1 (9.0-9.2); shelf of bony palate, 3.2 (2.9-3.4); palatine slits, 5.2 (4.9-5.3); diastema, 5.7 (5.5-6.0); postpalatal length, 8.3 (8.1-8.4); maxillary tooththrow, 3.4 (3.3-3.5).

Specimens examined.—Total number, 7, from the type locality.

Remarks.—Some specimens of *P. c. disparilis* from Tule Tank, Yuma County, Arizona, are intermediate in characters between *disparilis* and *rupicolus*. There is no indication of intergradation with *delgadilli* except that one specimen of the latter differs sharply from the rest and resembles *rupicolus* in color. Possibly this specimen indicates that immigration to the lava bed across the low desert takes place from time to time.

***Peromyscus crinitus scopulorum*, new subspecies.**

Type.—Adult male, skin and skull, no. 83045 Mus. Vert. Zool.; from Cerro La Cholla, 6 miles west-northwest of Punta Peñasca, Sonora, Mexico; collected April 3, 1938, by Seth B. Benson; original number 5024.

Distribution.—Restricted to the Cerro La Cholla, northwestern Sonora.

Diagnosis and comparisons.—A large, bright-colored, long-tailed race. Differs from *P. c. disparilis* in dusker color, more sharply bicolored tail,

greater size. Color difference on dorsum caused by wider basal band, narrower subterminal band, wider black tip. Skull, nasals, and palatine slits longer. Braincase more rounded, higher, especially in region of interparietal. Differs from *delgadilli* and *rupicolus* in paler, brighter color, larger size, and in the skull characters listed above.

Color.—Hair on dorsum with base Dark Plumbeous, narrow subterminal band Light Ochraceous-Buff, tip black. Lateral stripe Light Ochraceous-Buff. Hair on belly with base Dark Plumbeous, tip white. Tail bicolor, dark above, white beneath. Feet white.

Measurements.—Average and extreme measurements of 5 adult and subadult males: Total length, 189 (179–197); tail, 109 (104–115); hind foot, 19 (19–20); ear from notch, 20 (19–21); ear from crown, 17 (15–17); weight in grams, 15.3 (13.8–17.0); length of head and body, 80 (75–82). *Skull*: Greatest length, 24.2 (23.9–24.5); basilar length, 17.5 (17.2–17.8); zygomatic breadth, 11.5 (11.3–11.7); interorbital constriction, 4.0 (3.9–4.1); nasals, 9.4 (9.0–9.9); shelf of bony palate, 3.4 (3.2–3.5); palatine slits, 5.3 (5.1–5.5); diastema, 5.8 (5.7–5.9); postpalatal length, 8.3 (8.1–8.5); maxillary toothrow, 3.3 (3.2–3.4).

Specimens examined.—Total number, 6, all from the type locality.

Remarks.—There is confusion regarding the names of the landmarks near the type locality. According to present usage, the name Punta Peñasca is restricted to the fishing village situated at the base of a lava hill which projects into the sea. Five miles west-northwest there is a granitic headland also projecting into the sea and now known locally as Cerro La Cholla. According to various maps this headland has been named Punta Peñasca, Punta Peñascosa, Punta Piedras, and Sea Lion Bluff. For instance, on the map (Baja California, Norte; 1 : 1,000,000; Provisional Edition; American Geographical Society of New York, 1924) Cerro La Cholla is labeled Punta Peñasca. Probably the name Punta Peñasca was first applied to this headland, and not to the much smaller lava hill, but I follow present usage in restricting the name Punta Peñasca to the fishing village.

The three subspecies named above are to me indistinguishable from *P. c. disparilis* in proportions and in most skull characters. All may be distinguished from *P. c. stephensi* by their greater size and longer tails. The differences between *disparilis*, *scopulorum*, *rupicolus*, and *delgadilli* are chiefly in color. Each one of these subspecies has an extremely restricted range. The area occupied by *scopulorum*, for instance, is approximately one square mile. Notwithstanding the small areas of range these populations are clearly distinct from one another. The pale yellow *disparilis* and the nearly black *delgadilli* are the extremes in color for this species and yet their ranges are separated only by a few miles.

The following circumstances help to explain the existence of these different colors. In this area this species inhabits only the steepest and rockiest places; these, for the most part, are separated from one another by low-lying, sandy desert where this species ordinarily does not occur; some of the hills are nearly white or light gray, and others are black. There is a definite correlation between the color of the animal and the color of the background in which it lives.



PROCEEDINGS
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A NEW TRAP-DOOR SPIDER FROM TEXAS.

BY RALPH V. CHAMBERLIN.

The type of the trap-door spider described below was sent to me for identification by Prof. J. C. Cross, who found it near Kingsville, Texas. It represents a new genus most closely allied to *Myrmekiaphila*, a genus also occurring in Texas. The type is retained in the author's collection.

ASTROSOGA, gen. nov.

Carapace with fovea deep and strongly procurved. Ocular tubercle scarcely set off, very broad and low. Anterior row of eyes a little procurved, the medians smaller than the laterals, much farther from each other than from the latter. Posterior row of eyes recurved, the eyes much smaller than the anteriors, the medians much farther from each other than from the laterals. Chelicerae bearing within at distal end a toothed process much as in *Myrmekiaphila*, but this relatively smaller. Sternum as wide as or a little wider than long. Posterior median sigilla broad, close together, diverging caudad; the posterior lateral sigilla in line with anterior ends of posterior median, very small, about equidistant from large sigilla and the lateral margin; anterior sigilla circular, equal in size to the posterior laterals, very close to lateral margins. Both tibia I and tibia II swollen below and bearing on the swelling stout spines, the modification being much as in the second legs of *Evagrus*. Paired claws of anterior legs with many teeth, the posterior smooth except for a double spike at base and typically two denticles with an even pad of soft hairs beneath. Anterior tarsi not spined, the posterior with numerous spines along sides and above.

Genotype.—*Astrosoga rex*, sp. nov.

Differs from *Myrmekiaphila* in the teeth of the tarsal claws, in the secondary characters of the male, etc.

Astrosoga rex, sp. nov.

Pars cephalica nearly black; the carapace dark chestnut adjacent to head and in a median posterior band, elsewhere light chestnut. Legs dark, the first pairs nearly black. Abdomen dark brown with numerous long black hairs above, lighter brown in a band across anterior corners and along sides of dorsum.

FEB 17 1940

Anterior median eyes much smaller than the laterals, separated from each other by their diameter, farther from the laterals. Posterior row of eyes decidedly recurved, the medians much smaller than the laterals, which are about equal to the anterior medians; laterals widely apart, each occupying a position about halfway between that of the anterior median and lateral of the corresponding side, more than its diameter from the lateral and nearly equidistant between lateral and anterior median. Lateral eyes on each side less than the diameter of the posterior one apart.

The swelling of tibia I of the male more pronounced than that of tibia II, the ventral apex of the swelling distad of middle and bearing two exceptionally stout spines; a single ventral spine proximad of this spinigerous elevation. The tibia of the second legs of male more slender than tibia I, with the ventral swelling similar but located a little proximad of middle, its apical spines similarly stout; two ventral spines in line proximad of the swelling.

Paired claws of anterior legs with 7 or 8 teeth in a series extending from base to a little beyond middle. Double spike at base of posterior paired claws with one extending straight distad and one uncate; the denticles minute, 2 in number.

Tibia of male palpus evenly swollen. Stylus suddenly narrowed and geniculate at about beginning of distal third of length.

Posterior spinnerets moderately long, thick proximally, attenuated distally, the apical joint slender, longer than the second joint but shorter than the first. Anterior spinnerets short and stout, inserted about their diameter apart.

Length without chelicerae, 20 mm.

Locality.—Texas: Kingsville. One male taken by Prof. J. C. Cross of the Texas College of Arts and Industries.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DICHAPETALACEA ET EUPHORBIACEAE NOVAE.

BY LOUIS CUTTER WHEELER

One new species of *Stephanopodium* from Colombia, and two new species of *Euphorbia*, one from the Big Bend area of Texas and the other from the Central Valley of California, are described in this paper. Further evidence is offered concerning the correct application of the names of two Linnaean species of *Euphorbia*. A much earlier name of Rafinesque's is shown to be conspecific with one of Englemann's *Euphorbiae*. Finally, two varietal combinations are made.

STEPHANOPODIUM aptotum, sp. nov. Folia elliptica vel elliptico-oblongeolata, acuminata, 12.5-15 cm. longa, integra, subcoriacea, penninervia; petioli crassi, 8-10 mm. longi, glabri; flores supra medium petiolum inserti, cymosi, 4-9; pedicellis 2-3 mm. longis, puberulentis, apice articulatis; calyx campanulatus; sepala oblonga, imbricata, inaequala, basi breviter connata, intus glabra, extus strigosa; corolla glabra, tuba cylindrica calycem subaequantis; lobis oblongo-ovatis, basi subsagittatis; glandulae hypogyneae subrectangulares; germen 3-loculis, breviter pubescentis; styli rami 3, 1 mm. longi.

Typus: Santa Marta, Colombia, *H. H. Smith, 1701* in hb. Gray.

Habit unknown; branches woody, glabrous; leaf-blades elliptic to elliptico-oblongeolate, shortly acuminate, 12½-15 cm. long, 4½-6 cm. wide, glabrous, sub-coriaceous, entire, pinnately nerved; petioles 8-10 mm. long, glabrous, strongly wrinkled; stipules not seen; cyme 4-9-flowered, borne about 2/3 of way up petiole; pedicels puberulent, 3-4 mm. long, markedly articulated with the stipe of the flower; stipe ca. 1 mm. long; flower 9-11 mm. long including stipe; calyx campanulate, lobes oblong, markedly unequal, shortly strigose without, bordered, especially the longer, by a subglabrous zone next to the ciliate margin, glabrous within; corolla tube equalling or slightly exceeding the calyx; corolla glabrous throughout, cylindrical, lobes oblong-ovate, base sub-sagittate; anthers sessile, 1.1-1.3 mm. long; hypogynous glands subrectangular, adnate below to the corolla; ovary shortly pubescent, 3-loculed; style branches 3, ca. 1 mm. long.

Type: Santa Marta, Colombia, *H. H. Smith 1701* (Gray Herb.).

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This species belongs to sect. *Isorthsiphon* Baillon. It is easily distinguished from the four previously described species of this genus by the three style branches and the 3-celled ovary.

H. H. Smith 1701 is cited by Rusby, *Descr. 300 New Species S. Am. Pl.*, 55, 1920, as *Rhamnus atroviridis* but the plant there described is quite different. Examination of the type at New York Botanical Garden proved that it is *Rhamnus*. The field tag bearing the number 1701 is still attached to one of the branches of the specimen here described as a new species.

The basic work on the vascular anatomy of epiphyllous inflorescences is: Candolle, Casimir de, 1890. *Recherches sur les inflorescences épiphyllées. Mémoires de la Société de Physique et d'Histoire de Genève. Volume supplémentaire, 1890.*—No. 6. 37 pp., Pl. I–II.

EUPHORBIA *Golondrina* sp. nov. Annuua, glabra; caulibus prostratis, ramosis, usque ad 15 cm. longis, tenuibus, internodiis usque ad 2 cm. longis; laminis foliorum 6–9 mm. longis, oblongis, integris; petiolis ca. 1 mm. longis; cyathia in axillis solitariis, turbinatis, cum diametro 1.1–1.3 mm.; glandulis saepe suborbiculatis; appendiculis glabris, albis, semi-lunatis; florum masculorum 39–50 per cyathium; stylis fere ad basim partitis, ca. 0.4 mm. longis; capsula late ovoidea, 3-angulata, ca. 1.8 mm. longa; seminibus subtetragonis, ca. 1.8 mm. longis, irregulariter leviterque rugulosis.

Annual, glabrous; stems prostrate, to 15 cm. long, 0.7–1.5 mm. thick, internodes up to 2 cm. long; leaf-blades mostly 6–9 mm. long, oblong to narrowly oblong or even narrowly elliptic, entire, base inaequilateral; petioles ca. 1 mm. long, amplexicaul; stipules 0.7–1 mm. long, mostly glabrous, ventral united into a median, subulate, often bifid structure, dorsal distinct, linear; peduncles 1–1.5 mm. long; cyathia solitary in the axils; involucre turbinata, 1.1–1.3 mm. diam., glabrous without, glabrous within except for short hairs at base of lobes, gland stipes and a line extending half-way down below the stipes; lobes slenderly deltoid-attenuate, not quite equaling the glands; glands subcircular or a little longer than wide, deeply concave, sometimes folded together, 0.3–0.5 mm. in diam.; appendages white, glabrous, entire, forming a semi-lunate margin to the gland, 0.2–0.5 mm. wide; sinus U-shaped, slightly depressed, short-hairy; 5th gland linear, equaling the lobes and clothed like them; bracteoles more or less united together below and adnate to the involucre, free ends linear, short-hairy; staminate flowers 8–10 per fascicle, 39–50 per cyathium; androphores ca. 1.5 mm. long, glabrous; gynophore glabrous, exserted and reflexed at maturity; ovary glabrous, obtusely 3-angled; styles ca. 0.4 mm. long, glabrous, parted nearly to the base, slightly clavate; capsule broadly ovoid, glabrous, 3-angled, ca. 1.8 mm. long; seeds 1.6–1.8 mm. long, subquadrangular, narrowly ovate radially, base truncate, ca. 0.8 mm. radially and tangentially, facets slightly convex, irregularly wrinkled, dorsal and lateral angles blunt, raphe so low and blunt as to scarcely separate the front facets.

Type: Along sandy beach at entrance to Boquillas Canyon, Chisos Mountains Area, Brewster County, Texas, Aug. 5, 1937, *B. H. Warnock 998* (U. S. Nat. Herb. #1726028).

This species is another drab member of *Euphorbia* subgenus *Chamaesyce* Raf. It is possessed of no striking characters but nevertheless is distinguishable from its relatives by sufficiently definite characters. The combination of foliage glabrous save for perhaps occasionally a few hairs on the stipules, glands circular or nearly so yet with evident white appendage, tetragonal seeds, and 39–50 staminate flowers per cyathium, is an exclusive combination of characters.

The specific name is the common Spanish name used by the Mexicans for many small prostrate spurges of this subgenus: "Yerba de la Golondrina" or often merely "Golondrina." This seemingly irrelevant appellation is derived, Professor Maximino Martinez informs me, from the popular belief that the swallows which skim close to the ground upon which these spurges lie are feeding on the seeds.

EUPHORBIA Hooveri sp. nov. Annuæ, glabra; caulibus prostratis vel decumbentibus; foliis breviter petiolatis, orbiculato-cordata vel orbiculato-reniformis, papillatis, acutiuscule serratis; stipulis connatis, profunde laceratis; cyathia in axillis solitariis; involucris glabris, campanulatis; glandulis transverse ovatis; appendicibus albis, in 3–5 segmenta linearia partitis; lobis longissimis, latissimis, apicem versus profunde partitis, laciniis digitos ranae simulantibus; florum masculorum 30–35 per cyathium; stylis integris, longissimis, capsulas superantibus; capsulae glabrae, coccis rotundatis; seminibus ovoideo-tetragonis, albis, irregulariter rugosis.

Annual; stems prostrate or decumbent, to 20 cm. long, glabrous, from 1 mm. in diam. near the tips to as much as 3.5 mm. in diam. at the base, internodes as much as 1.5 cm. long, shorter toward the stem tips; petioles ca. 0.5 mm. long; blades 2–5 mm. long, orbicular-cordate to orbicular-reniform, glabrous, papillate, margin with sharp white teeth; stipules united, white, deeply lacerate; peduncles ca. 0.5 mm. long; cyathia solitary in the axils; involucre 1.7–2 mm. in diam., campanulate, glabrous without and within except beneath the glands; lobes much exceeding the glands, narrowly deltoid, lacinate; glands transversely oval, ca. 0.5 mm. long, slightly cupped, at first red, then olive; appendages white, glabrous, parted into 3–5 ligules ca. 1 mm. long; 5th gland of 1 or 2 filiform segments equaling the lobes; sinus narrowly V-shaped, not depressed; bracteoles united only at the base, filiform, sparsely hairy, ca. 2/3 as long as the androphores, forming a radial row opposite each gland; staminate flowers 30–35 per cyathium, 6–7 per fascicle; androphores 2–2.1 mm. long, glabrous; gynophore glabrous, long-exserted and reflexed at maturity; ovary glabrous, 3-lobed; styles 1.7–2 mm. long, entire; capsule spheroid with flattened base, roundly 3-lobed, glabrous, 1.6–1.9 mm. long; seeds ovoid-quadrangular, rotund-ovate radially, raphe slightly curved, back semi-circular, facets covered with low irregular, smooth ridges, 1.4–1.6 mm. long, 1–1.1 mm. tangentially and radially, coat white and microreticulate.

Type: Yettém, Tulare County, California, June 30, 1937, *R. F. Hoover 2583* (Gray Herb.). Other collections are: Yettém, Tulare County, California, June 4, 1936. *R. F. Hoover 1277* (Gray Herb.); 4 miles southeast of Vina, Tehama County, California, Aug. 2, 1938, *R. F. Hoover 3722* (Gray Herb.).

Dr. Robert F. Hoover, discoverer of this remarkable plant, has supplied the following field notes: "It grew under peculiar conditions: in the dry alkaline bed of a rain-pool, where the soil was bare except for a very sparse growth of *Distichlis stricta*, *Cressa truxillensis*, and *Marsilea vestita*, near Yettum, Tulare County. The leaves are covered with minute projections which in the fresh plants looked like minute water vesicles." This adds another plant to the peculiar rain-pool vegetation of the Great Valley of California.

This is as unique a member of *Euphorbia* subgenus *Chamaesyce* Raf. as *E. Golondrina* is ordinary. The papillate epidermis, lobes much exceeding the glands, combined with the extremely long, yet entire, styles serve to readily distinguish this species from all its congeners. The problem of its origin is very puzzling. It appears to have certain qualities, mainly such vague qualities as aspect and texture of the foliage, which suggest a relationship with the peculiar race, with 11-17 staminate flowers (rather than 5-10) and sharply toothed appendages, of *Euphorbia serpyllifolia* Persoon found in central California and represented, e. g., by *H. K. Sharsmith 3868*, Arroyo Bayo, Mount Hamilton Range, Santa Clara County (Gray Herb.).

EUPHORBIA HYPERICIFOLIA L., Sp. Pl. 1 : 454. 1753. At Field Museum are two valves of the capsule and a seed from the type. These fragments support my conclusion, *Contr. Gray Herb.* 127 : 73-74. 1939, that *E. hypericifolia* should be applied to the plant generally known as *E. lasiocarpa* Klotzsch.

EUPHORBIA MACULATA L., Sp. Pl. 1 : 455. 1753. This name is properly applied to the plant commonly known as *Euphorbia nutans* Lag., *Chamaesyce nutans* (Lag.) Small, Fl. SE. U. S., 712, 1333. 1903; or *Euphorbia Preslii* Guss., Fl. Sic. Prod. 1 : 539. 1827, *Chamaesyce Preslii* (Guss.) Arthur, *Torreya* 11 : 260. 1912. It is rather amazing that the misapplication of this name to the small-leaved, generally prostrate plant properly known as *Euphorbia supina* Raf., *Amer. Monthly Mag.* 2 : 119. 1817, should have continued so long. Photographs of the type of *E. maculata* are at both Field Museum and Gray Herbarium. In *Contr. Gray Herb.* 127 : 74-76, I have reviewed the history of this misapplication.

EUPHORBIA MISSURICA Raf., *Atlantic Journ.* 1 : 146. 1832; based on "E. PORTULACOIDES WILLD.?" sensu Torrey, *Ann. N. Y. Lyceum* 2 : 244. 1827. Torrey had an original diagnosis, and the specimens on which it was based are still preserved at New York Botanical Garden. The only possible ground for challenging the validity of Rafinesque's new name is the question as to whether Rafinesque gave a sufficiently clear reference to satisfy the requirements of International Rules of Botanical Nomenclature, ed. 3, Art. 44. Rafinesque, p. 144, commenced his article "7. Twenty new genera of plants from the Oregon Mountains &c." in these words: "My friend Dr. John Torrey of New York is one of the best Botanists of our country; . . . Thus in his valuable account of the 491 plants collected in or near the Oregon Mts. by Dr. James, published in 1827, he has described many plants in ambiguous terms . . ." With this much information it is an easy matter to locate the paper by means of the standard reference Catalogue of Scientific Papers (1800-1863) compiled by the Royal Society of London,

vol. 6 : 10. 1872, where, under Torrey, John, entry 8, the paper is listed. In this case Rafinesque was accurate in giving 1827 as the date of publication and the "Roy. Soc. Cat." erred in giving 1828, which was the final date of the volume. Rafinesque erred as to "491 plants" for there were 481, but that does not affect the validity of the reference. This case is important not merely for this one name. There are several other names involved. Gleason, N. Amer. Fl. **33** : 91. 1922, accepted the combination "*Vernonia marginata* (Torr.) Raf., Atl. Jour. [1]:146. 1832" based on *V. altissima* var. *marginata* Torr., Ann. Lyc. N. Y. **2** : 210. 1827. *Euphorbia missurica* Raf. is an earlier name for *E. zygophylloides* Boiss., Cent. Euph., 10. 1860, *Chamaesyce zygophylloides* (Boiss.) Small in Britton & Brown, Ill. Fl., ed. 2, **2** : 161. 1913; *Euphorbia Nuttallii* (Engelm.) Small in Britton & Brown, Ill. Fl. **2** : 371. 1897, *Chamaesyce Nuttallii* (Engelm.) Small, Fl. SE U. S., 711, 1333. 1903.

EUPHORBIA MISSURICA Raf. var. **intermedia** (Engelm.) comb. nov.; based on *Euphorbia petaloidea* Engelm. β *intermedia* Engelm. in Emory, U. S. & Mex. Bound. Surv. **2** (1):185. 1859. *E. petaloidea* a *Nicolletii* Engelm., l. c. is synonymous.—This variety intergrades completely with the species. However, the intergradation occurs in the zone where the ranges of the two overlap rather than throughout the range of both. Consequently the variety is worthy of recognition. It ranges from Minnesota west to North Dakota and Wyoming, thence south to Texas and New Mexico. In contrast to this, the species occupies a much more restricted range as it occurs only from Missouri and Kansas south to northwestern Arkansas and Texas.

EUPHORBIA SERPYLLIFOLIA Pers. var. **hirtula** (Engelm.) comb. nov.; based on *E. hirtula* Engelm. ex S. Watson, Bot. Calif. **2** : 74. 1880. The only definite distinction between this variety and the species is the presence of hairs in the variety. Usually this distinction is definite, but in some collections there are villous plants, plants with a few scattered hairs, and completely glabrous plants. Previously, Bull. So. Calif. Acad. Sci. **33** : 111. 1934, I had thought that there were other distinctions, but examination of hundreds of collections of the species and dozens of the variety has shown that these supposed distinctions fail in too many cases to be useful.

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THE STATUS OF DU BUS' TYPE OF *GRANATELLUS*
VENUSTUS.

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At Brussels in July, 1939, I was engaged in the study of the types of North American birds housed in the Musée d'Histoire Naturelle. A considerable amount of material of more than ordinary interest was discovered since Brussels was the center of activity for Du Bus, for a time Bonaparte, and later, Dubois, all of whom were actively interested in American birds. This collection (so far as concerns Americana) does not seem to have been critically examined by any modern ornithologist.

Among the types examined was that of *Granatellus venustus*, known originally from Plate 24 of Du Bus' "Esquisses Ornithologiques." The plate, so far as is known, had no accompanying text but was nevertheless a duly published and properly captioned part of the 5th livraison (plates 21-25) issued some time in 1849. It was erroneously cited by Bonaparte (Consp. Avium, 1, 1850, 312) as number 34, an error which was repeated by Sclater (P. Z. S. Lond., 1864, 607) and by others since that time, although Ridgway (Birds No. and Mid. Amer., 2, 1902, 697) cites it correctly. Incidentally, other names in the above cited work of Du Bus which are now accredited to Bonaparte (including of course the generic name of *Granatellus*) properly belong to the former author, but full data on this matter will be presented in a report on the Brussels types, now in nearly completed manuscript.

Du Bus' type of *Granatellus venustus* is No. 8210 of the Brussels Museum. It is an adult male, mounted on a small, conventional, bar perch and is in good condition; the plumage is only slightly abraded as though the bird had been taken in winter or early spring. The only locality given on the stand or in the old register is "Mexique." The original source is not indicated, although it was possibly acquired from Parzudaki or the Verreaux Brothers, both of which dealers seem to have transmitted many specimens to Du Bus and the Brussels Museum at this period. It is the only example

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of the species which has ever been in the collection, so far as could be determined, and since it matches the plate in detail its authenticity can scarcely be questioned.

The characters are at variance with the definition of the nominate race as generally conceived and described in detail by Ridgway. The auriculars are plumbeous (save on the anterior portion) and are concolorous with the sides of the neck instead of being wholly black and sharply defined; the median underparts are more rosy (less vermillion) and the upper parts are somewhat duller and less bluish plumbeous. Some of these items might be attributed to a post-mortem change occasioned by 90 years, but careful comparison of specimen with plate discloses no significant differences. Measurements of the type are: wing, 59; tail, 65; exposed culmen, 13.0; depth of bill at base, 5.4; width at nostril, 4.2; tarsus, 20.0; middle toe minus claw, 11.1 mm. Parenthetically, it may be stated that Sclater (*sup. cit.*, pl. xxxvii) states that his figure is an exact copy of Du Bus' plate, which is true save that the blue of the upper parts is slightly brighter than in the original.

As a restricted type locality for *venustus*, I suggest Comitán, Chiapas. This is indicated by an adult male in the British Museum (98.12.1.827) taken at that place by W. B. Richardson on April 20, 1897. It is badly mutilated and most of the head characters are destroyed; such as remain, however, together with the darker dorsal coloration and more rosy underparts seem to be very close to the type.

It remains to provide a name for the better known race of the west coast of Mexico, which is here called

***Granatellus venustus melanotis*, subsp. nov.**

Type.—Male adult, 92.4.20.1589, Brit. Mus.; San Blas, Tepic [Nayarit], Mexico, May 1, 1889; collected by W. B. Richardson.

Subspecific characters.—Adult males similar to *Granatellus venustus venustus* Du Bus of Chiapas but auriculars wholly black; sides of body paler; median under parts more vermillion (less rosy); upper parts slightly lighter and more bluish plumbeous.

Range.—Southern Sinaloa south to Guerrero. A single female from Santa Efigenia, Oaxaca (143353 Biol. Surv.) is darker and more buffy and the throat is less purely white than more northern specimens. It perhaps represents *venustus*, but in the absence of females of that race and also of males from Oaxaca, I do not place it racially at this time.

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TWO NEW BIRDS FROM NORTHWESTERN TEXAS.

BY JAMES O. STEVENSON.

Investigations by the writer over the past few years in the Palo Duro Canyon region of the central Panhandle of Texas have led to the discovery of two apparently undescribed subspecies of birds.

Descriptions of these two new birds follow.

I am indebted to authorities of the United States National Museum and the Bureau of Biological Survey for the use of comparative material from their collections. I am also indebted to Dr. Harry C. Oberholser of the Bureau of Biological Survey for assistance in preparation of this paper.

Baeolophus atricristatus paloduro, subsp. nov.

Type.—Adult male (in fresh fall plumage); Palo Duro Canyon, Harold Ranch, Armstrong County (18 miles e. Canyon, Randall County), Texas; September 25, 1938; collected by J. O. Stevenson; orig. no. 1352.

Subspecific characters.—Similar to *Baeolophus atricristatus sennetti* Ridgway of central Texas, but tarsus longer; upper parts darker, less olivaceous (more grayish). To be differentiated from *B. a. atricristatus* by much greater size throughout and darker back, and the dull white forehead is invariably tinged with brown, the forehead color ranging from cream-buff to drab (Ridgway, 1913).

Measurements.—Male (ten specimens): wing, 73-79.5 (ave. 76.17) mm.; tail, 67.5-74.5 (ave. 70.3) mm.; exposed culmen, 10-11.5 (ave. 10.5) mm.; tarsus, 20-22.5 (ave. 21.4) mm. Female (six specimens): wing, 69-79 (ave. 75.5) mm.; tail, 62.5-73 (ave. 68.7) mm.; exposed culmen (5), 9.5-10.5 (ave. 9.9) mm.; tarsus, 20-22 (ave. 20.7) mm.

Range.—So far as is known, occurs only in Palo Duro and adjacent canyons of the Texas Panhandle that are drained by creeks tributary to the South Fork of Red River. This form is known to be resident in wooded canyons and "breaks" in Randall and Armstrong counties. Probably it is also resident in similar associations in neighboring counties of the Panhandle. It is interesting to note that the presence of the Black-crested

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Titmouse has not been previously recorded from the Texas Panhandle. *Sennetti* ranges northwest to Young County, Texas, some 200 miles south-east of *paloduro* territory. Whether the species occupies the intervening plains area is unknown.

Remarks.—Twenty-three adult and immature specimens of *paloduro* were collected by T. F. Smith and the writer in the months of February, May, August, September, and December in Randall and Armstrong Counties, Texas. Most of these, including the type, have been deposited in the Bureau of Biological Survey Collection, Washington, D. C.; the rest are in the collection of the Chicago Academy of Sciences.

***Richmondena cardinalis planicola*, subsp. nov.**

Type.—Adult female, Palo Duro Canyon, Elkins Ranch, Randall County, Texas; December 26, 1936; collected by Tarleton F. Smith; orig. no. 1232.

Subspecific characters.—Similar to *Richmondena cardinalis canicauda* (Chapman) of central and southern Texas and Mexico but females differ in red of crest more extensive and more prominent, buff or brownish wash on breast more prominent and occasionally tinged with red, and longer wing and tail. Males are similar in coloration although the crest is somewhat duller; both sexes differ from *canicauda* in that the bill is shorter and more stubby, i. e., relatively thicker in proportion of depth to length.

Planicola differs from *Richmondena cardinalis magnirostris* (Bangs) as follows: in females, the capistrum is less extensive, the breast lighter with brownish wash seldom extending to the belly, back grayer and wing and tail longer. In males, the back is grayer, underparts lighter, capistrum less extensive, wing and tail longer. In both sexes, the bill is shorter and relatively thicker than in *magnirostris*.

Measurements.—Male (seven specimens): wing, 92–96.5 (ave. 93.8) mm.; tail, 99–108 (ave. 102.8) mm.; exposed culmen, 17.0–18.5 (ave. 17.7) mm.; height of bill, 16–17.5 (ave. 16.7) mm.; width of mandible, 12–13.5 (ave. 12.8) mm.; tarsus, 23.5–26 (ave. 24.5) mm. Female (seven specimens): wing, 88–96 (ave. 92.5) mm.; tail, 98–112.5 (ave. 103.1) mm.; exposed culmen (6), 16.5–18.0 (ave. 16.9) mm.; height of bill, 15.5–16.5 (ave. 16.2) mm.; width of mandible, 12–13 (ave. 12.5) mm.; tarsus, 23–26 (ave. 24.3) mm. Note: measurement of height of bill at base taken from base of exposed culmen to lowest posterior angle of the bare portion of the side of mandible. This is the method used by Ridgway in measuring finches for *The Birds of North and Middle America* (U. S. N. M., Bull. 50, part 1, 1901) as explained by Baldwin, Oberholser and Worley (*Sci. Publ. Cleve. Mus. Nat. Hist.*, vol. 2, 1931, p. 19). Width of mandible at base was taken in accordance with the method described by Baldwin, Oberholser, and Worley (*op. cit.*, p. 40).

Range.—Central region of the Texas Panhandle and east to western Oklahoma. Twenty adult and immature specimens were collected in wooded sections of Palo Duro Canyon in Randall and Armstrong Counties Texas.

These have been deposited in the Bureau of Biological Survey Collection, Washington, D. C.

The above measurements include two males from western Oklahoma that are referable to *planicola*. These were taken at Arnett and Mt. Scott Post Office, respectively.

Remarks.—Cardinals from the Texas Panhandle possess a combination of certain color characters of both *R. c. canicauda* and *R. c. magnirostris*, its nearest associates. It clearly differs in length of wing and tail and shape of the bill. Color differences are best brought out in females of *planicola*; differences in size are discernible in both sexes. In colors of certain parts there is a similarity to corresponding parts in either *canicauda* or *magnirostris*; in color of some parts, *planicola* is clearly intermediate.

It is possible that the range of *planicola* extends into southwestern Kansas. Specimens from that region have not been examined. *Planicola* probably intergrades with *magnirostris*, the Gulf Coast race that is resident in eastern Oklahoma, in the central section of that State.

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A NEW *HYPOPACHUS* FROM GUATEMALA.

BY L. C. STUART.

In a recent paper¹ I have described a new *Gymnophthalmus* from the Salamá desert basin of Baja Verapaz, Guatemala. A further examination of the collection which I brought together from that region during the summer of 1938 has revealed a new *Hypopachus*. To the memory of the great English naturalist, C. C. Champion, who made the first biological explorations in this desert basin, I dedicate

Hypopachus championi, new species.

Holotype.—An adult male, Museum of Zoology, University of Michigan, No. 85533, collected in a temporary pool on the desert flats about one kilometer south of San Gerónimo, Baja Verapaz, Guatemala, on the evening of July 6, 1938. Collector, L. C. Stuart.

Diagnosis.—A *Hypopachus* of the *cuneus-variolosus* series with a compressed, outer, metatarsal tubercle, and distinguished from *variolosus*, its closest relative, by the more extensive webbing on its feet and its much paler undersurface.

Description of holotype.—Snout rounded, acute in lateral view, slightly longer than the diameter of the eye. Canthus rounded, loreal region oblique and slightly concave. Interorbital space almost twice as broad as the upper eyelid. Fingers free, comparative lengths II-I-III-IV, subarticular tubercles prominent and conical, three palmar tubercles at base of hand. Toes not dilated, web between third and fourth extending almost to second tubercle on fourth toe. Toes slightly more than one-half webbed, second fully webbed on outer side. Comparative toe lengths IV-III-V-II-I. Subarticulate tubercles well developed and conical, two metatarsal tubercles, the outer compressed and obliquely transverse. The heels overlap when the legs are adpressed. Skin smooth above with many small spinules; smooth beneath with a leathery texture. A transverse fold between the eyes extends around and behind the eye and obliquely posterior to the arm insertions.

In spirits the ground color of the dorsum is pale brown and that of the

¹L. C. Stuart, "A Description of a New *Gymnophthalmus* from Guatemala, With Notes on Other Members of the Genus," *Occ. Papers Mus. Zool. Univ. Mich.*, 409 (1939): 1-10, Pl. I.

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head purplish brown. Superimposed on the dorsal ground color is a large irregular blotch of the same color as and contiguous with the color of the surface of the head. This blotch is narrow on the nape, widens at mid-body and constricts again above the anus, leaving the dorsal ground color visible on either side of the nape and along the sides. From the tip of the snout extending posteriorly to the anus is a very narrow light line. The sides of the head become progressively lighter ventrally, leaving the lips a dirty white. An irregular light streak extends from the eye posteriorly and ventrally to the arm insertions. A trace of a narrow dark line is visible on the side of the head from the snout, through the eye and posteriorly onto the shoulder where it enlarges to become an irregular dark blotch. The upper surfaces of the arms and legs are brown mottled with darker, and the latter spotted with black. A large black blotch is visible dorsally at the leg insertions. The entire upper surfaces are covered with tiny spicules which have a white apex. Ventrally the sides become progressively lighter and fade into the dirty cream color of the belly, which shows faint reticulations posteriorly becoming more intense on the undersides of the legs. The chin is gray. A narrow, faint, light line extends partially along the posterior surface of each thigh from the anus. The palms and feet are gray, with unpigmented tubercles.

From my field notes, I quote the following:

“Dorsal ground color varying from brownish gray to reddish brown. The center of the back with a dark-edged darker blotch. Median stripe gray to bright yellow. Dorso-laterally evidences of dark irregular band, most pronounced between eye and arm insertions where it appears as upper border of dark blotch which is irregular and above arms. Small granules of dorsum with white points, giving appearance of white punctations. Upper surfaces of arms and legs as dorsum with irregular mottlings of black. Dark irregular blotch in front of leg insertions. Sides gradually lightening to grayish color of ventrum which may be faintly reticulated or spotted with darker or immaculate; same for undersurfaces of arms and legs. Fine light line from anus down legs to heel.”

Range.—Though known only from the type locality, it is possible that this species occupied the arid portions of the Rio Motague Valley and the desert basins of central Guatemala.

Paratypes.—Museum of Zoology, University of Michigan, No. 84079 (42), collected with the holotype, and Nos. 84080 (23), 84081 (41), 84082 (36) taken July 8, 1938, at the type locality.

Variation.—The large paratypic series shows that considerable variation exists in this species. The general body proportions are more or less constant, but the interorbital width may vary 1.5–2.0 times the width of the upper eyelid, and the heels may overlap or fail to meet when the legs are adpressed. The webbing on the toes also shows considerable variation, and the web between the third and fourth toes may be as little as in *variolosus* or greater than in the holotype, but its average extent is slightly less than to the second subarticular tubercle. In other morphological features, such as snout length, phalange length, the extensively webbed second toe and the prominence of the subarticular tubercles, variation is negligible.

Although variation in coloration is extensive, the pattern is always essen-

tially as that described above. The only significant pattern variant is to be found in the intensity of the ventral coloration. Although the majority of specimens show a faint gray reticulum posteriorly, this occasionally is replaced by small black punctations. The ventrum of this species, however, is never so dark as that of *H. variolosus*.

In the large series at hand only a single female is to be found. This single individual suggests that the females are essentially like the males in all respects except in the extent of webbing on the feet. The web between the third and fourth toes in this female extends only to the first tubercle on the fourth toe, and the webs between the other toes are similarly greatly reduced.

Relationships.—There appear to exist in Central America two distinct groups of *Hypopachus*. The *inguinalis* group in which the outer metatarsal tubercle is rounded, contains, in addition to *H. inguinalis* Cope, the recently described *H. globosus* and *H. barberi* of Schmidt.² This group is restricted to what is referred to geologically as "nuclear Central America." Schmidt suggests that yet another species of this group may exist in Alta Verapaz, for his specimens, collected at the type locality of *H. inguinalis*, Cobán, are decidedly smaller than measurements given by Parker.³ This seems improbable, as I have collected other specimens in the Cobán region which are larger than Schmidt's specimens and check well with Parker's measurements. The *cuneus* group, with a compressed outer metatarsal tubercle, is made up of *H. cuneus* Cope, *H. oxyrhinus* Boulenger, *H. variolosus* (Cope), and the form described above. The group ranges from the United States southward into Panama. Though the interrelations of this group are at present in an unsettled state, it is evident that, on the basis of the extensive webbing on the toes, *H. championi* resembles most closely *H. variolosus*.

Habits.—Nothing is known of the habits of this species beyond the fact that it appears to breed comparatively late in the season. Though the rains "break" during May in the Salamá basin, this form apparently does not emerge until well into July. During the evenings of July 6 and 8, 1938, following brief but heavy showers, the specimens were found in great numbers wherever water accumulated on the desert flats. At that time breeding had not commenced, for the females were just beginning to become active. The paratype series contains but a single female. That the males were in breeding condition was evidenced by the fact that many males were found clasping. The call of the species, a low, harsh quack, is similar to that of *H. cuneus*, which I collected in the Petén. Associated with *championi*, either within or beside the same pools, were *Hyla baudinii* Duméril and Bibron and *Hyla staufferi* Cope.

Acknowledgments.—For financial aid which enabled me to make the collections mentioned above, I am indebted to the Horace H. Rackham School of Graduate Studies, University of Michigan, and for assistance in studying this species of *Hypopachus*, I wish to thank my colleague, Mrs. Helen T. Gaige.

²Karl P. Schmidt, "New Central American Frogs of the Genus *Hypopachus*," *Zool. Ser. Field Mus. Nat. Hist.*, 24, 1, 1939: 1-5, Fig. 1.

³H. W. Parker, "A Monograph of the Frogs of the Family Microhylidae," British Museum (Natural History). London, 1934: 112.



PROCEEDINGS
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NEW RACES OF *EMPIDONAX* FROM MIDDLE
AMERICA.

BY ROBERT T. MOORE.¹

The accumulation in the Moore Collection of 576 specimens of the genus *Empidonax*, all fresh individuals recently received and representing every race in Mexico and Central America, has thrown new light on this difficult group. The implications will be discussed in detail in my report on the birds of Sinaloa and surrounding states. I need say here only that in the species *E. difficilis* the development of characters from one race to an adjoining one follow north-south axes, somewhat recalling a similar process, which was described in my "Review of the Subgenus *Burricea*," Condor, Vol. XLI, September-October, 1939, p. 178. In the arid areas of both the desert and plateau groups the yellow becomes brighter as we proceed south and the greens on the breast become more brownish, contrasting strongly with the yellows of the belly and throats. On the other hand, there is a group between them in the heavier rainfall mountain areas, following the Rocky Mountains south along the Sierra Madres of Sonora to Nayarit, in which the yellows of the belly and greens of the breast become *duller*, as we proceed south, so that the entire under parts are much more uniform. Two races, hitherto undescribed, appear in this continuous mountain chain, both of them far more distinct from true *difficilis* to the west and *hellmayri* to the east than they are from each other. They are described herein, as well as another unexpected race from Honduras.

My grateful acknowledgments are made to Mr. Peters for permission to examine specimens in the Museum of Comparative Zoology; to Mr.

¹ Contribution from the California Institute of Technology.

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Griscom, who graciously re-examined with me the *difficilis-flavescens* group of *Empidonax* from Chiapas and Honduras, and who concurs with my determination of the new form from Honduras; to Dr. Wetmore for his unusual generosity in granting the right to inspect specimens recently taken in Guatemala, and to him, Dr. Friedmann, Dr. Oberholser for permission to compare the material in the United States National Museum and the Biological Survey; to Mrs. Donald Dickey and Adrian van Rossem for similar courtesies covering the Dickey Collection.

***Empidonax difficilis immodulatus*,² subsp. nov.**

MT. MOHINORA FLYCATCHER.

Type.—Adult breeding female; number 18472; collection of Robert T. Moore; east side of Mt. Mohinora peak, S. W. Chihuahua, Mexico; Upper Transition Zone, altitude 10,500 feet; May 12, 1937; collected by Robert T. Moore.

Subspecific characters.—Nearest to *Empidonax difficilis difficilis*, but differs in having breast-band wider, duller, darker green, and throat duller green; upper parts somewhat darker, and size somewhat larger. Differs from *Empidonax d. hellmayri* of Texas in duller breast and upper parts; belly paler yellow. Differs from *E. d. occidentalis* Nelson of southern Mexico, formerly known as *E. d. bairdi*, in having upper parts and breast less brownish; wing bands paler; bend of wing less cinnamon.

Range.—From Transition Zone of extreme S. W. Chihuahua (11,000 feet), north through higher parts of Sierra Madres at least to Upper Sonoran Zone (6,000–7,000 feet) of Santa Rita Mountains, Arizona.

AVERAGE MEASUREMENTS OF *E. d. immodulatus*.

	Wing	Tail	Ex. Cul.	Wid. Cul.	Tar.
Average—19 ad. ♂.....	69.5	58.8	11.1	5.4	16.5
Average—7 ad. ♀.....	65.1	56.5	10.9	5.7	—

Specimens examined.—Moore Collection—*E. d. immodulatus*: Mexico: Chihuahua: Mt. Mohinora 1 ♀ (Type May 12 breeding), San Feliz 1 Im. ♂ (Aug. 19); Durango: Muertocito 1 ♂ (June 11 breeding). Migrants: Sinaloa: Palos Verdes Mine 1 ♂ (Oct. 29), Rancho Batel 1 ♂ (Apr. 15); Nayarit: Tepic 1 ♂ (Aug. 22). M. C. Z. Collection—Chihuahua: Pinos Altos 5 ♂ 1 ♀ (June 4–July 14), Bravo 6 ♂ 2 ♀ (July 24–Aug. 8), Jesus Maria 1 ♀ (Apr. 24). Slightly intermediate between *immodulatus* and true *difficilis*, but nearer the former: Dickey Collection—United States: Arizona: Santa Rita Mts. 3 ♂ 2 ♀ (May 7–June 8 breeding). *E. d. hellmayri*, *E. d. difficilis* and *E. d. occidentalis*: large series of the second and third in the Moore, U. S. N. M., Bio. Sur., Amer. Mus. Nat. Hist. collections and adequate series of the first in the U. S. N. M. and Bio. Sur. collections.

² *Immodulatus*, unrhythmical, because this form breaks up the rhythm of the yellow-bellied races of *difficilis* as we proceed from the coastal desert of Sinaloa east to Chihuahua and Durango.

Remarks.—The southern end of the Rocky Mountains and their continuation, the Sierra Madres of Mexico, with their heavier rainfall areas at high altitude, break up the east-west continuity of the brighter yellow-bellied races of *difficilis*. In these areas along the tops of the mountains from elevations of 6,000 feet to 11,000 feet, we have two races, both of them with darker greens and paler yellows than the races of the more arid desert areas, to the east and west. *Immodulatus* extends from some unknown point in the southern Rocky Mountains, at least from the Santa Ritas in Arizona, south to about Muertocito and San Feliz near the junction of the three states of Chihuahua, Durango and Sinaloa. At about this place a new mountain race begins, which has a still paler yellow belly and smaller size, to be described later. Intergrades between the two appear at Muertocito near the Durango-Sinaloa line. The male from this locality in its large size and coloration is almost pure *immodulatus*, whereas the female has the coloration of the more southern race, but the large size of the northern race, being almost an exact intergrade.

The specimens from the Santa Rita Mountains, which I have classed as slightly intermediate between true *difficilis* of California and *immodulatus*, are definitely breeding birds of that area, the May 30th female having had a nest with four eggs. These birds are perceptibly darker on the throat and upper part of the breast than true *difficilis*, average larger in size and differ very little, if at all, from *immodulatus*. Although I have inspected a fine series of *hellmayri* at the U. S. National Museum, I have not been able to directly compare these Arizona birds with them, but I have compared the series of true *immodulatus* with both at different times. Coming from the 6,000–7,000 feet elevation, they certainly represent the tendency of all the birds of the great mountain chain, dividing the western desert from the eastern high plateau areas, to show darker coloration above and on anterior under parts.

The altitude of the Type locality on Mount Mohinora, 10,500 feet, is the highest point at which we have taken any *difficilis* in Mexico. *Immodulatus* migrates due south along the tops of the mountain range, following them to as low an altitude as 3,000 feet at Tepic in Nayarit, but it does not seem to descend to the more arid coastal plains of Sinaloa to the west, nor even to the higher plateau to the east in Durango.

***Empidonax difficilis bateli*, subsp. nov.**

RANCHO BATEL FLYCATCHER.

Type.—Female adult nesting; number 20639, collection of Robert T. Moore; Rancho Batel, six miles north of Santa Lucia in mountains of southeastern Sinaloa, Mexico; June 4, 1938; altitude 6,200 feet; collected while sitting on nest by Robert T. Moore.

Subspecific characters.—In breeding plumage nearest to *E. d. immodulatus* of Chihuahua, but belly paler yellow; greens above and below darker and duller; bend of wing more buffy; and size much smaller. Differs from *Empidonax difficilis difficilis* in being much darker and greener (less yellowish) olive above; much more brownish olive (less yellowish) on upper breast; inner margins of secondaries in adults more buffy; throat and belly much

duller; and under parts much more uniform below. Differs from *E. d. hellmayri* of Texas, as well as from the birds of the plateau region of Chihuahua and Durango, in having the upper parts darker and browner; breast browner; abdomen paler yellow; and size smaller. Differs from *E. d. occidentalis* of the southern part of the Mexican Plateau in being darker throughout, much purer green (less yellowish); and duller both in the greens, as well as yellow of abdomen.

Range.—In the Transition Zone of the high mountains of western Durango, southeastern Sinaloa and Nayarit, chiefly on the western side of the Sierra Madres.

AVERAGE MEASUREMENTS OF *E. d. bateli*.

			<i>Ex.</i>	<i>Wid.</i>	
	<i>Wing</i>	<i>Tail</i>	<i>Cul.</i>	<i>Cul.</i>	<i>Tar.</i>
Average—4 ad. ♂	63.6	53.8	10.7	5.3	16.2
Average—1 ad. ♀ (Type).....	62.5	56.3	10.4	5.3	16.0

Specimens examined.—Moore Collection—*Bateli*: Sinaloa: Rancho Batel 1 ♀ (Type, June 4), 1 ♂ (May 22); Nayarit: near Tepic 3 ♂ (Aug. 20–23). Intergrade, *bateli* x *immodulatus*: Durango: Muertocito 1 ♀ (June 16).

Remarks.—*Bateli* is not an intergrade, nor an intermediate. It is darker and duller both in the greens and yellows than any of the races geographically surrounding it, and it is smaller than any of them.

***Empidonax difficilis seclusus*, subsp. nov.**

OCOTOPEQUE FLYCATCHER.

Type.—Male adult in freshly molted breeding plumage; number 16907, collection of Robert T. Moore; Montaña El Chorro, Ocotopeque, northwestern Honduras; June 30, 1936; collected by C. F. Underwood.

Subspecific characters.—Nearest to the birds of Guatemala, currently believed to be the same as *Empidonax salvini* Ridgway, but differs from the type in being browner, duller (less glossy green) above; darker buff (more cinnamon) on bend of wing and wing-bars; throat and belly much brighter yellow. Differs far more from the specimen recently taken by Griscom (Bird-life in Guatemala, Bull. Am. Mus. Nat. Hist., Vol. LXIV, 1932, p. 264) and the old Dueñas individual in the Museum of Comparative Zoology in the above-mentioned characters, but especially in being much browner above. Differs markedly from members of the species, *Empidonax flavescens*, in being very much duller (more brownish) green above; paler yellow on throat and belly; duller brown (less yellowish-green) on breast; wing-bars more cinnamon (much less green). Differs from *E. difficilis occidentalis*, hitherto known as *E. difficilis bairdi*, in much darker breast (green instead of brown), more contrasted with the throat; greener back; and smaller size.

Range.—High mountains of northwestern Honduras (Province of Ocotopeque).

AVERAGE MEASUREMENTS OF *E. d. seclusus*.

	Wing	Tail	Ex. Cul.	Width Cul at Nostril	Tar.
Average—4 adult ♂.....	65.7	54.4	10.5	5.3	15.9
Average—7 adult ♀.....	62.2	51.6	10.9	5.5	15.8

Remarks.—The finding in the Moore Collection of a series of nine breeding adults (June 24 to July 27, 1936) and two juveniles, just out of the nest, extends the range of the *difficilis* group several hundred miles farther south and constitutes the first recorded specimens for Honduras. However, two specimens in the Museum of Comparative Zoology, obtained at El Derrumbo, Honduras, by Mr. Underwood, were taken earlier, July 16 and July 22, 1933, but were classified at the time as *E. flavescens dwighti*. They may indicate that *seclusus* breeds farther south in Honduras.

The type of *Empidonax salvini* Ridgway is a puzzling bird. Dr. Dwight pointed out to Dickey and van Rossem (Auk, 1928, Vol. XLV, p. 359) that "the bright green *Empidonax* which has currently passed as *salvini* did not agree with the original description (Ridgway's) of that form," and expressed the belief the type "remains unique." Griscom (Opus cit. p. 264) called attention to an old specimen in the Museum of Comparative Zoology from near the type locality, Dueñas, which in his judgment is a topotype and recorded the "rediscovery" of the species as represented by an immature male, taken by himself at Panajachel on August 15, 1930. There is a strong possibility that these two latter are the same as *salvini*, but certain discrepancies should be pointed out.

The Moore Collection contains a large series of recently-taken breeding birds, both of *E. flavescens dwighti* and two races of *E. difficilis*, a total of about forty individuals coming from two widely separated general areas, near Comitán in southeastern Chiapas and various localities in the Province of Ocotopèque in northwestern Honduras. Specimens of *flavescens* and of *difficilis* occur in both groups from exactly the same places, so it is obvious that they are specifically distinct. The chief specific characters distinguishing them are that the *flavescens* group shows glossy brighter green above and below, whereas the *difficilis* group has a much duller back, while the throat and belly are paler yellow and the breast browner. In addition, the *flavescens* group has the wing-bars distinctly greenish, whereas the *difficilis* group shows these areas more brownish-cinnamon. Comparing the Dueñas and Panajachel individuals, mentioned above, with these two series it becomes clear that they belong definitely to the *difficilis* group, although the former is somewhat soiled on the breast.

Unfortunately, we can not be so certain about the type of *salvini*. In some characters it resembles *difficilis* and in some *flavescens*, leaning a little closer to the former. For example, the upper parts are glossy-green and in this character precisely match my two male specimens of *E. flavescens dwighti* from Santa Rosa, Chiapas, but on the under parts it is closer to *difficilis*, showing a distinct contrast between the breast, which is brownish-olive, and the dirty yellow belly. It lacks the general greenish coloration

of the *under* parts so characteristic of *flavescens*. On the whole, it is closest to a June 9th female of *difficilis* in the Moore Collection from Santa Rosa, Chiapas. Unquestionably this type is badly "foxed" below and it may never be possible to determine if it is a hybrid between the *difficilis* and *flavescens* group, or truly represents a race of *difficilis*, existent in Guatemala. Griscom was inclined to believe that the type of *salvini* and the Dueñas specimen belong to the *difficilis* group and were migrants from farther north, probably under the impression that no member of the *difficilis* group bred that far south. The discovery of my new series of unquestionably breeding adults of *seclusus* (June 4–July 27), from Honduras, and, furthermore, the taking of two birds with very short tails just out of the nest at Monte Verde in the Province of Ocotopeque, prove that *difficilis* does breed much farther south, and leads to the inference that some form of *difficilis* should breed in Guatemala. Therefore, it seems to me unwise to disturb the current name for the bird of Guatemala, *E. d. salvini*, which should include apparently those of Chiapas, for my female from Santa Rosa resembles the type, except for the glossy backs, rather closely.

All of the females of *seclusus* have the outer (tenth) primary shorter than the fourth, while in the males it is a little longer, but still shorter than the fifth primary.

The reduction of *Empidonax bairdi* Sclater to the synonymy of *Tyrannula affinis* Swainson (van Rossem, Bull. Mus. Comp. Zool. Vol. LXXVII, No. 7, p. 393) leaves the bird of southern Mexico from Guerrero through Oaxaca to Morelos, including Michoacan and the State of Mexico, without a name, unless *breeding* specimens of *E. d. salvini* be found in Guatemala and prove to be identical with the breeding birds of southern Mexico. Van Rossem (loc. cit.) indicated finding only winter specimens in the British Museum. Fortunately there is another name available. The type of *Empidonax bairdi occidentalis* Nelson from Pluma, Oaxaca, although taken in March, can be matched precisely by some at least of my new series of freshly-taken individuals from south central Mexico, particularly by a Temascaltepec male with sex organs fully developed (June 23, 1934), by a female from Chapultepec, Morelos, marked on the tag "ovaries in breeding condition" (May 23, 1935), while it differs from a June 11th female from Huitzilac, Morelos, and from a May 24th male from Omilteme, Guerrero, in being only very slightly paler above. Therefore, I suggest that tentatively the breeding birds of southern Mexico be known as *Empidonax difficilis occidentalis* Nelson. On the other hand, I believe that Ridgway was correct in reducing *Empidonax bairdi perplexus* Nelson to the synonymy of *difficilis difficilis*. It is a female with a wing measurement of only 61.8 mm., far too small to represent a migrant of *Empidonax difficilis hellmayri* Brodtkorp, which I deem a perfectly valid race.

Van Rossem in the Auk (1928, Vol. XLV, p. 359) and again in his Birds of El Salvador (Field Mus. Nat. Hist. Zool. Ser. Vol. XXIII, p. 380) lays great stress on the orbital ring in *Empidonax salvini* not being interrupted by a "wedge of green" as it is in *Empidonax flavescens dwighti*. In my long series of the two species I find this character variable and believe we have too few authentic specimens of *salvini* to rely upon it. The type may be

abnormal. For example, of my three specimens of *Empidonax flavescens flavescens* from Costa Rica, two have the eye-ring complete and in several specimens of the *E. difficilis* group some both complete and incomplete eye-rings are found.

Specimens examined.—*Seclusus*—Moore Coll.—Honduras: Province Ocotopeque, Montaña El Chorro 1 ♂ (Type June 30), El Chorro 1 ♂ 1 ♀ (June 24–July 9), Montaña El Sillon (? = ♂ July 2), Montaña La Cruz 4 ♀ (June 25–July 7), Las Ventanas (? = ♀ July 27), Monte Verde 2 juv. ♂ (just out of nest July 22–24); M.C.Z. Coll.—Honduras: El Derrumbo 1 ♂ 1 ♀ (July 16–22). *Salvini*—U. S. N. M. Coll.—Guatemala: Calderas 1 ♂ (Type Oct. 10); M.C.Z. Coll.—Guatemala: Panajachel 1 Im. ♂ (Aug. 15), Dueñas 1 (? = ♀); Moore Coll.—Mexico: Chiapas: Santa Rosa 1 ♀ (June 9). *Occidentalis*—Biol. Sur. Coll.—Mexico: Oaxaca: Pluma 1 ♂ (Type March 18), Guerrero: Omilteme 1 ♂ 2 ♀ (May 22–24); Michoacan: Mt. Tancitaro 1 ♂ 1 ♀ (March 1–3); Morelos: Cuernavaca 1 ♂ (Jan. 3), Huitzilac 1 ♀ (June 11); Moore Coll.—Chapultepec 1 ♂ 2 ♀ (Feb. 28–May 23), Atlacomulco 1 ♂ (Aug. 30); Mexico: Desierto de Leonos 1 ♂ 1 ♀ (Apr. 11), Temascaltepec 1 ♂ (June 23); Guerrero: Cuapongo 1 ♂ (May 30); M.C.Z. Coll.—Tamaulipas: Galindo 4 ♂ 3 ♀ (Mch. 16–22); Vera Cruz: Orizaba 2 ♂; Moore Coll.—N. W. Guanajuato: Xichu 1 ♂ 1 ♀ (Apr. 20–24 breeding). Intermediates—*Occidentalis* x *batei*—Michoacan: Rancho La Cofradia near Uruapan 8 ♂ 3 ♀ (June 7–July 5 all breeding). *E. flavescens dwighti*—Moore Coll.—Mexico: Chiapas: Santa Rosa 2 ♂ 2 ♀ (June 1–16); Honduras: Ocotopeque: Montaña El Chorro 1 ♂ 2 ♀ (June 30–July 3), El Chorro 1 ♂ 1 ♀ (June 22–23), Las Ventanas 1 ♂ 1 (?) (July 27), Monte Verde 1 ♂ 1 ? (July 21–24), Montaña La Cruz 1 ♂ 1 ♀ (June 25–July 7), Monte El Portillo 1 ♀ (May 30); Province Tegucigalpa: Alto Cantoral 2 ♂ (Jan. 16–24), Cantoral 1 ♂ 3 ♀ (Feb. 5–Apr. 18); Underwood Coll.—Honduras: Tegucigalpa: Alto Cantoral 4 ♂ 2 ♀ 2 ? (Jan. 17–Feb. 10), Cantoral 5 ♂ 3 ♀ (Jan. 25–Apr. 16), El Derrumbo 1 ♂ (Aug. 3). M.C.Z. Coll.—Guatemala: San Lucas 1 ♂ 1 ♀ (Jan. 14–June 5); A. M. N. H. Coll.—Guatemala: Finca Sepur 1 ♂ (Dec. 29), Vol. San Lucas 2 ♀ (June 1–4), Vol. de Agua 1 ♀ (May 15), Tecpam 1 ♀ (July 21). Also I have inspected the female from Tumbala, Chiapas (Nov. 17).



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SOME BRYOZOA FROM VICTORIA ISLAND, N. W. T.

BY LOUIS W. HUTCHINS.¹

The Bryozoa from the arctic north of Canada and west of Hudson Bay have been recorded only once. Those collected by the Southern Party of the Canadian Arctic Expedition were described by Osburn in 1923. Through the kindness of Dr. Charles Schuchert and Dr. Carl O. Dunbar of the Peabody Museum of Yale University I have been permitted to examine a small collection made during the summer of 1939 in the waters of Victoria Island by Mr. Preston E. Cloud, to whom my best thanks are also due. For assistance in making some of the determinations I am much indebted to Dr. Raymond C. Osburn of the Ohio State University.

The collection represents three stations: (1) Read Island, in Simpson Bay, Dolphin and Union Strait, at the southwest corner of Victoria Island, July 29; (2) Ulusaktuk, on the north shore of Prince Albert Sound, just north of Holman Island, July 31; and (3) on the north shore of Prince Albert Sound, 10 miles east of Holman Island, August 10. At the first two points, Fucus was collected on the shore, while at the third Bryozoa were found on Laminaria brought up from 20 feet on an anchor. The surface temperature of the water at the last two stations was 41° F. (5° C.).

The collection is small in number of species, but of interest from the numbers of those occurring in it. The range of one species, furthermore, has been increased.

Order CYCLOSTOMATA Busk, 1852.

Family Lichenoporidae Smitt, 1866.

Genus Lichenopora DeFrance, 1823.

Lichenopora verrucaria (Fabricius), 1870. (Cf. Osburn, 1923, p. 5; 1933, p. 17, Pl. I, fig. 8.) Specimens are present from all three stations, being particularly abundant at station 3. Many of the colonies are young, with visible ancestrulae. It is previously recorded as abundant in this region.

¹ Contribution from the Osborn Zoological Laboratory, Yale University.

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Family Diaperocidae Canu, 1918.

Genus Diplosolen Canu, 1918.

Diplosolen obelium (Johnston), 1838. (Cf. Osburn, 1923, p. 5; 1933, p. 14, Pl. I, fig. 7.) This species, placed by many earlier authors in the genus Diastopora of Lamouroux, has not previously been taken west of King George Sound, Hudson Strait. Two specimens from there are mentioned by Osburn (1923) as having been taken by the *Diana* Expedition. In the present collection it is common from station 2, and there is a single specimen each from 1 and 3. Almost all the specimens have ovicells.

Order CHEILOSTOMATA Busk, 1852.

Suborder ANASCA Levinsen, 1909.

Division II, Malacostega Levinsen, 1909.

Family Alderinidae Canu and Bassler, 1927.

Genus Callopora Gray, 1848.

Callopora lineata (Linneus), 1766-1768. (Cf. Osburn, 1923, p. 7; 1933, p. 22; Hincks, 1880, p. 143, Pl. 19, figs. 3-6.) The species is common from stations 1 and 2. Many of the colonies are quite large, up to half an inch across. A single specimen was previously known from this region.

Genus Tegella Levinsen, 1909.

Tegella unicornis (Fleming), 1828. (Cf. Osburn, 1923, p. 8; 1933, p. 24; Hincks, 1880, p. 154, Pl. 20, fig. 4.) Like the previous species, this species was formerly known from this region on the basis of a single colony. It is common from all three stations, though somewhat less so from station 3. The variety *armifera* Hincks, 1880, though well represented in the Canadian Arctic Expedition material, does not seem to occur in this collection.

Division V, Cellularina Smitt, 1867.

Family Scrupocellariidae Levinsen, 1909.

Genus Menipea Lamouroux, 1816.

Menipea sp. A single fragment of a representative of this genus was found in the material from station 3. It consists of an ancestrula and part of the first internode, the distal end of which shows clearly immature zoecia. The specimen is too damaged for specific determination.

Suborder ASCOPHORA Levinsen, 1909.

Family Hippothoidae Levinsen, 1909.

Genus Hippothoa Lamouroux, 1812.

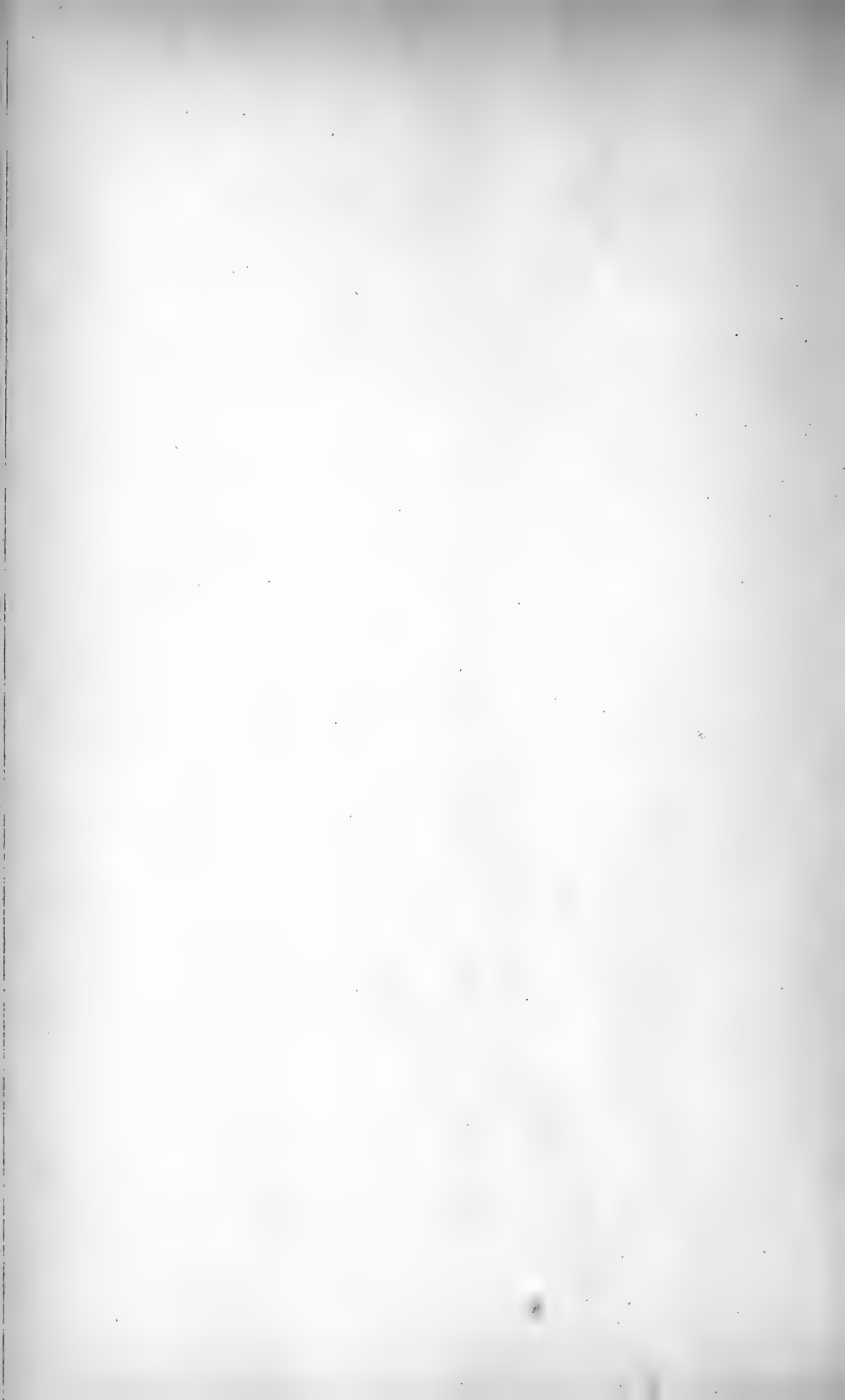
Hippothoa hyalina (Linneus), 1766-1768. (Cf. Osburn, 1923, p. 9; 1933, p. 33, Pl. 9, figs. 1-3.) Specimens are abundant from stations 1 and 3, and common at 2. It is estimated that the collection contains well over 250 specimens of this species, representing all stages in the growth of the colony. Two colonies were previously known from this locality, and Osburn (1923) also records specimens from northern Alaska and Hudson Bay.

Genus *Harmeria* Norman, 1903.

Harmeria scutulata (Busk), 1855. (Cf. Osburn, 1923, p. 9; Smitt, 1868, p. 25, p. 165, Pl. 27, figs. 160, 161.) The species is abundant from all three stations. The colonies are mostly quite small, agreeing in this respect with the six specimens reported by Osburn, and taken August 1, 1915. A few large colonies show the highly characteristic diminutive peripheral zooecia. It may be worthy of note that in these colonies there seems to be a rather sharp division between the large, central zooecia, and the small, marginal ones, rather than the progressive and gradual diminution suggested by Busk in his original description.

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24.0673

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW NORTH AMERICAN SIPHONAPTERA.

BY H. E. EWING,

Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

There are described in this short paper two new genera, two new subgenera, and two new species of North American fleas. Illustrations for these new siphonapterons will appear in a much more extended paper now being completed, in collaboration with Irving Fox, which treats of all the North American genera and species of fleas.

PARATYPHLOCERAS, new genus.

Gena broad, truncate apically; with an oblique comb of six, pointed spines on truncate end. Eyes absent. Frontal tubercle small, inconspicuous. Labial palpus with eight segments, extending slightly beyond tip of coxa. Upper sclerite of metepisternum separated from metanotum by an inner horizontal ridge. Coxa III without a row or patch of spinelets on inside. Posterior borders of tibiae with stout bristles in groups of two or three. Plantar bristles on segment V of tarsus II, five; on segment V of tarsus III, six; first pair of plantar bristles not displaced. Abdominal tergal plate VII of female produced into a short process between two groups of antepygial bristles.

Type species.—*Paratyphloceras oregonensis*, new species.

Remarks.—This new genus is nearest *Typhloceras* Wagner, from which it differs in having the labial palpus composed of eight segments instead of five and in having six spines in the genal comb instead of four. The large type species of this new genus is somewhat suggestive of members of the subfamily Hystrihopsyllinae, but since it possesses a frontal tubercle and less than seven spines in the genal comb, it and its genus are referred to the subfamily Ctenophthalminae.

Paratyphloceras oregonensis, new species.

Front somewhat reduced but forming more than one-half of anterior margin of head. Gena enlarged, longest in a subvertical direction. Two setae in ocular row; ocular seta extending for about one-third its length beyond tip of antenna. Setae in head comb increasing in width and length from I to IV; V subequal with IV; VI smaller than V. Maxillary palpus

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reaching about to apex of coxa I; maxillary lobe long, daggerlike, reaching to middle of segment III of maxillary palpus. Pronotal comb with nine spines on each side. Mesonotum about equal in length and width to pronotum. Metanotum shorter but broader than mesonotum. Fused upper sclerite of metepisternum subtriangular, with a large, posterior, marginal bristle, a large, ventral, submarginal bristle, and two much smaller discal setae. Abdomen large, somewhat swollen, and clothed with long setae dorsally and ventrally, but not laterally. Abdominal tergum I with a transverse row of eight apical spines; tergum II with a transverse row of eight apical spines; tergum III with six apical spines; tergum IV with two apical spines; other abdominal terga without apical spines. Antepygial bristles long, subequal; three on each side. Stylet long, slender, curved; with a large, dorsal, subterminal bristle and a much smaller terminal seta and an outer, subterminal seta. Receptaculum seminis with medium-sized, subspherical head and a short, strongly curved, truncate tail.

Length of female, 5.1 mm.; *greatest depth of abdomen*, 1.7 mm.

Type host.—"Mink."

Type locality.—Mercer Lake, Oregon.

Holotype.—U. S. National Museum No. 54,000.

Remarks.—Described from one female taken March 12, 1933, by H. H. Stage (U. S. Bur. Ent. Bish. No. 19156).

APTILOPSYLLA, new genus.

Head longer than high, not semicircular in outline. Frontal tubercle present, situated very near fronto-genal angle of head. Maxilla acuminate apically. Eyes vestigial. Antennal segment II enlarged laterally. Post-antennal region of head without dorsal incrassation. Prothorax not reduced; setae of pronotum not arranged in a transverse row. Mesepisternum separated from mesepimeron by internal vertical ridge. Metepimeron without comb. External dorsal setae of tibia not forming comb. Abdomen without a true or false comb, and with few apical spines. Abdominal terga II to VII each with a dorsal incrassation. Antepygial bristles present, one on each side of abdomen.

Type species.—*Aptilopsylla carlsbadensis*, new species.

Remarks.—*Aptilopsylla* is most nearly related to *Ptilopsylla* Jordan and Rothschild, from which genus it is differentiated by having the frontal tubercle situated very near the fronto-genal angle, and the mesepisternum separated from the mesepimeron by an internal vertical ridge.

Aptilopsylla carlsbadensis, new species.

Front very broadly rounded, with two pairs of dermal pits. Frontal tubercle well developed, angulate distally, situated about its width from fronto-genal angle. Ocular seta situated on margin of antennal groove above degenerate eye. Gena produced backward into a pigmented process. Labial palpus five segmented, not reaching to middle of coxa I. Pronotum with about twelve setae on each side in addition to a very large bristle situated near lower margin. Pronotal comb with twenty-four, rather slender, sharply-pointed spines. Mesonotum longer than either pronotum or metanotum. Mesepimeron without distinct posterodorsal margin, thus

appearing as if anchylosed with mesonotum. Metanotum longer than upper sclerite of metepisternum, from which it is separated by an internal ridge. It bears on posterior margin a single pair of apical spines. Coxa I with a small patch of spinelets on curved surface of proximal end, and a large posterior marginal bristle somewhat distal to middle of margin. Abdomen clothed with setae below, and above, down to slightly beyond the line of spiracles. Antepygidial bristle about one and one-half times as long as pygidium. Stylet reduced to a low, inconspicuous tubercle, bearing a large terminal seta and two or three microsetae. Receptaculum seminis with subspherical head and a strongly curved tail about one and one-half times length of head.

Length of female, 2.2 mm.; *greatest depth of abdomen*, 0.7 mm.

Type host.—Unknown. Type labeled "On bat guano."

Type locality.—Carlsbad, New Mexico.

Holotype.—U. S. National Museum No. 54,001.

Remarks.—Described from one female taken June 14, 1938, by K. Dearolf.

Euhoplosyllus, new subgenus.

With the characters of *Hoplosyllus* Baker and in addition: Club of antenna not capitate, segments separated anteriorly by grooves. Antennal groove partly or entirely open in male, closed in female. Clasper of male with broad, setigerous, anterior process and slender, fingerlike, posterior process, armed at tip with a stout, pigmented, spinelike seta; movable finger almost straight.

Type species.—*Hoplosyllus affinis* Baker.

Remarks.—The genus *Hoplosyllus* Baker was based on *Pulex anomalus* Baker. This species has been recognized for some years as one apart from its congeners. Its male genital armature is of a type very distinctive, hence a new subgenus is proposed for the other species, which are *Hoplosyllus affinis* Baker, *H. exoticus* Jordan and Rothschild, and *H. glacialis* (Taschenberg). The last-mentioned species has three varieties, *glacialis*, type variety, *lynx* (Baker), and *foxi* Ewing. Two described species, *Hoplosyllus powersi* C. Fox and *H. minutus* C. Fox, are regarded as synonyms of the variety *foxi* Ewing.

Acediopsylla, new subgenus.

Mandibles much enlarged. Genal comb of five to seven spines, each of which is rounded apically. Sternum VIII of male large, with a deep, broad, seta-margined, posteroventral depression and a pair of expanded posterodorsal lobes. Sternum IX of male with anterior whiplike apophysis, a pair of vertical internal lobes, and a pair of conspicuous, setigerous, posterior processes.

Type species.—*Ctenocephalus inaequalis* Baker.

Remarks.—This subgenus of *Cediopsylla* Jordan is based chiefly on the characters of the genital armature of the male which are very radically different from those of the type species of *Cediopsylla*, *C. simplex* (Baker). It includes two varieties of the type species, the type variety, and *A. inaequalis interrupta* (Jordan).



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON NEARCTIC SPIDERS CHIEFLY OF THE
FAMILY THERIDIIDAE.

BY IRVING FOX.

For several years the writer has enjoyed the privilege of studying the Araneae in the collections of the United States National Museum. Among this material were found many of the specimens upon which Keyserling, in the latter part of the last century, based a number of new species. The work of making known the presence of these specimens and properly cataloguing the types was therefore indicated.

In addition to reporting the presence of Keyserling's types, as regards the family Theridiidae, opportunity is taken to describe three new species, two in the Theridiidae and one in the Lycosidae. Records of other species in the former family are also included, inasmuch as little is known concerning the distribution of these spiders.

I wish to express my appreciation to the authorities of the United States National Museum, especially Dr. E. A. Chapin, for their generosity in making loans and for desk space during long periods. Particular thanks are also due Dr. W. J. Gertsch of the American Museum of Natural History for his kindness and assistance.

Family Theridiidae.

Argyrodes globosus Keyserling.

Argyrodes globosus Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part I): 204, Pl. X, fig. 123, 1884.

Type.—The male holotype of this species from Crescent City, Florida, is in the United States National Museum (U. S. N. M. Cat. No. 1328).

Argyrodes cancellatus (Hentz).

Theridium cancellatus Hentz, Boston Jour. Nat. Hist. 6 : 278, Pl. IX, figs. 17, 18, 1850.

Argyrodes larvatus Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part I): 197, Pl. IX, Fig. 118, 1884.

Type.—The male holotype of *A. larvatus* Keys. from Columbus, Texas,

which is regarded as a synonym of *A. cancellatus* (Hentz), is in the United States National Museum (U. S. N. M. Cat. No. 1327). Other records are as follows: CALIFORNIA, San Diego, male and female. DISTRICT OF COLUMBIA, Washington, female. FLORIDA, Key West, female.

Argyrodes trigonum (Hentz).

Theridium trigonum Hentz, Boston Jour. Nat. Hist. 6 : 280, Pl. IX, figs. 24, 25, 1880.

Records.—DISTRICT OF COLUMBIA, Washington, male, two females. FLORIDA, Indian River, female. TEXAS, Houston, male.

Asagena americanum Emerton.

Asagena americanum Emerton, Conn. Acad. Arts and Sci. Trans. 6 : 23, Pl. IV, Fig. 6, 1882.

Records.—DISTRICT OF COLUMBIA, Washington, female. RHODE ISLAND, Providence, male.

Crustulina guttatum Wider.

Theridium guttatum Wider, Reuss. Zool. Miscel., p. 241, Pl. XVI, fig. 7, 1834.

Record.—DISTRICT OF COLUMBIA, Washington, male and female.

Dipoena buccalis Keyserling.

Dipoena buccalis Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part II): 42, Pl. XII, fig. 157, 1886.

Type.—This species was described from female specimens taken in Philadelphia, Pennsylvania, Fort Monroe, Virginia, and Atlantic City, New Jersey. The specimens from Atlantic City and Fort Monroe are in the United States National Museum, and the former is herewith designated the type (U. S. N. M. Cat. No. 1329). A female from Washington, D. C., is also in the collection.

Enoplognatha marmorata (Hentz).

Theridium marmoratum Hentz, Boston Jour. Nat. Hist. 6 : 273, Pl. IX, fig. 3, 1850.

Lithyphantes tectus Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part I): 138, Pl. VI, fig. 86, 1884.

Type.—The male holotype of *L. tectus* (Keys.) from Denver, Colorado, is in the United States National Museum (U. S. N. M. Cat. No. 1324). This name is regarded as a synonym of *E. marmorata* (Hentz). Other records of the species are as follows: DISTRICT OF COLUMBIA, two males, three females. FLORIDA, Crescent City, female. INDIANA, seven females. LABRADOR, female. MONTANA, Helena, female.

Euryopsis funebris (Hentz).

Theridium funebre Hentz, Boston Jour. Nat. Hist. 6 : 277, Pl. IX, fig. 11, 1850.

Records.—DISTRICT OF COLUMBIA, Washington, three females. SOUTH DAKOTA, Hill City, female.

Lithyphantes corollatus (Linnaeus).

Aranea corollatus Linnaeus, Syst. Nat., 10 ed., p. 621, 1758.

Records.—COLORADO, Empire City, male and female; Denver, two females. SOUTH DAKOTA, Hill City, female. UTAH, Spring Lake, two females; Summit Canyon, three females; Salt Lake, female.

Lithyphantes fulvus Keyserling.

Lithyphantes fulvus Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part I): 142, Pl. VI, fig. 89, 1884.

Type.—A female from Spring Lake, Utah, which was undoubtedly among Keyserling's original material, is herewith designated the type (U. S. N. M. Cat. No. 1326). Other records are as follows: FLORIDA, Archer, two females; Crescent City, numerous specimens. GEORGIA, Savannah, four females. TEXAS, Columbus, female. UTAH, Salt Lake City, five females.

Pedanostethus laticeps (Keyserling).

Theridion laticeps Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part I): 96, Pl. V, fig. 63, 1884.

Type.—The female holotype of this species, marked "Wyoming Territory," is in the United States National Museum (U. S. N. M. Cat. No. 1323).

Steatoda borealis (Hentz).

Theridium boreale Hentz, Boston Jour. Nat. Hist. 6 : 274, Pl. IX, fig. 4, 1850.

Records.—COLORADO, Denver, two females. DISTRICT OF COLUMBIA, Washington, numerous specimens. IOWA, Davenport, two males. OREGON, Lake Klamath, two females. PENNSYLVANIA, Altoona, three females. SOUTH DAKOTA, Hill City, male, four females.

Steatoda merula, new species.

(Fig. 3.)

Female.—Total length, 7.00 mm. Carapace, 2.90 mm. long, 2.40 mm. at widest place, .70 mm. wide in front. Carapace and abdomen colored as in the other species of the genus. Legs reddish brown, much lighter below than above, the femora darker. Sternum dark brown with evidences of a lighter median stripe, much darker than coxae and contrasting strongly with them. Anterior row of eyes recurved, slightly narrower than the procurved posterior row. Anterior median eyes closer to anterior lateral than to each other and larger than the latter (5/3); separated from each other by about three-fifths of a diameter, about one-half that distance from the anterior laterals. Eyes of posterior row subequal, the posterior median closer to posterior lateral than to each other; removed from each other by more than a diameter, from the posterior lateral by about three-fourths of a diameter. Lateral eyes of each row contiguous. Median ocular quadrangle slightly wider than long (13/11), about as wide in front as behind. Clypeus about two and one-half times as high as diameter of an anterior median

eye. Lower cheliceral margin without distinct teeth. Tibia and patella I, 2.70 mm. long. Tibia and patella IV, 3.50 mm. long. For structure of epigynum see Fig. 3.

Type locality.—ARIZONA: Female holotype from Mt. Lemmon, August 22, 1937 (C. J. Drake, Collector), in the author's private collection. Female paratype from an unknown locality in Arizona, and a female paratype from an unknown locality in New Mexico, in the United States National Museum.

Type.—U. S. N. M. Cat. No. 1368.

This new species is most closely related to *S. grandis* Banks and *S. zionis* Chamberlin and Ivie, from which it may be readily distinguished by the smaller and deeper atrium of the epigynum.

Teutana triangulosa (Walckenaer).

Aranea triangulosa Walckenaer, Faune Paris, 2 : 207, 1802.

Records.—DISTRICT OF COLUMBIA, Washington, February, three females. INDIANA, female. NEW JERSEY, Atlantic City, male and female. NORTH CAROLINA, Chapel Hill, female.

Teutana grossa (C. Koch).

Theridion grossum C. Koch, Die Arachniden, 4 : 112, Pl. CXL, Fig. 321, 1838.

Record.—CALIFORNIA, San Diego, female.

Theridion amputatum Keyserling.

Theridion amputatum Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part I) : 90, Pl. IV, fig. 58, 1884.

Type.—The male holotype of this species from "Centreville," Florida, is in the United States National Museum (U. S. N. M. Cat. No. 1322).

Theridion antonii Keyserling.

Theridion antonii Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part I) : 54, Pl. II, fig. 31, 1884.

Type.—The male holotype of this species from San Antonio, Texas, is in the United States National Museum (U. S. N. M. Cat. No. 1320).

Theridion differens Emerton.

Theridium differens Emerton, Conn. Acad. Arts and Sci. Trans. 6 : 9, Pl. I, fig. 1, 1882.

Records.—DISTRICT OF COLUMBIA, Washington, two males and female. LAKE SUPERIOR, July, two males. PENNSYLVANIA, Altoona, two males. VIRGINIA, Fort Monroe, female.

Thiridion murarium Emerton.

Theridium murarium Emerton, Conn. Acad. Arts and Sci. Trans. 6 : 11, Pl. I, fig. 3, 1882.

Records.—ARIZONA, Winslow, female. CALIFORNIA, Occidental, two females. INDIANA, female. WASHINGTON, female.

Theridion pictipes Keyserling.

Theridion pictipes Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part I): 64, Pl. III, fig. 38, 1884.

Type.—The female holotype of this species from "Centreville," Florida, is in the United States National Museum (U. S. N. M. Cat. No. 1321).

Theridion saylori, new species.

(Fig. 1.)

Female.—Total length, 6.20 mm. Carapace, 2.10 mm. long, 2.00 mm. at the widest place, .60 mm. wide in front. Carapace uniform dark brown without light markings. Clypeus somewhat lighter. Sternum, endites, labium, and coxae light brown. Legs light yellowish brown, femora darker than other joints; none of the joints annulate. Dorsum of abdomen grayish black in ground color with white punctations; venter dark with two white spots near spinnerets. First row of eyes procurved, medians somewhat closer to each other than to laterals and three-fourths as large as the latter. Second row of eyes slightly wider than first (15/14), the eyes equidistant with the medians three-fourths as large as the laterals. Median ocular quadrangle about as wide as long, narrower in front than behind (18/21). Clypeus higher than the median ocular quadrangle is long (22/20). Legs armed with numerous setae. Left leg I, 9.30 mm. long (coxa, .50 mm.; trochanter, .20 mm.; femur, 2.08 mm.; patella, .80 mm.; tibia, 2.40 mm.; metatarsus, 2.12 mm.; tarsus, 1.00 mm.). Left leg IV, 8.90 mm. long (coxa, .50 mm.; trochanter, .40 mm.; femur, 2.40 mm.; patella, .80 mm.; tibia, 1.70 mm.; metatarsus, 2.00 mm.; tarsus, 1.10 mm.). For structure of epigynum see Fig. 1.

Type locality.—Missouri: Female holotype from Ozark Lake, July 14, 1937 (L. Saylor, Collector).

Type.—U. S. N. M. Cat. No. 1369.

This new species may be readily separated from the other members of its genus by the structure of the epigynum and by the design on the abdomen.

Theridion spirale Emerton.

Theridion spirale Emerton, Conn. Acad. Arts and Sci. Trans. 6 : 10, Pl. I, Fig. 2, 1882.

Records.—ARIZONA, male. DISTRICT OF COLUMBIA, Washington, June, numerous specimens. MARYLAND, Chesapeake Bay, six males. PENNSYLVANIA, Philadelphia, August, female, two males.

Theridion studiosum Hentz.

Theridion studiosum Hentz, Boston Jour. Nat. Hist. 6 : 275, Pl. IX, fig. 5, 1850.

Records.—DISTRICT OF COLUMBIA, Washington, July, female. FLORIDA, Tampa, female. NEW YORK, Long Island, September, female. SOUTH DAKOTA, Hill City, female.

Theridion unimaculatum Emerton.

Theridion unimaculatum Emerton, Conn. Acad. Arts and Sci. 6 : 15, Pl. II, fig. 4, 1882.

Records.—DISTRICT OF COLUMBIA, Washington, numerous specimens. FLORIDA, five males. MARYLAND, Chesapeake Bay, female, four males.

Tidarren fordum (Keyserling).

Theridion fordum Keyserling, Spinnen Amerikas, Theridiidae, 2 (Part I): 23, Pl. I, Fig. 9, 1884.

Record.—FLORIDA, female.

Tidarren minor Chamberlin and Ivie.

Tidarren minor Chamberlin and Ivie, Utah Univ. Bul. 24 : 10, Pl. II, fig. 10, Pl. III, figs. 24, 25, 1934.

Records.—CALIFORNIA, San Francisco, female. DISTRICT OF COLUMBIA, Washington, female. FLORIDA, Key West, female.

Family Lycosidae.

Tarentula aquilonaris, new species.

(Fig. 2.)

Male.—Total length, 11.10 mm. Carapace, 5.00 mm. long, 3.30 mm. at widest place, 1.80 mm. wide in front. Carapace reddish brown with a broad median light longitudinal stripe and a lateral light submarginal band. Eye region darker, the eyes on black spots. Sternum dark brown to black. Endites, coxae, and distal portion of labium reddish brown. Femora dark brown with irregular annulations, remainder of legs much lighter. Dorsum of abdomen brown with a basal lanceolate mark; sides darker; venter concolorous with dorsum. First row of eyes slightly procurved, the medians separated by a diameter, closer to the laterals than to each other and subequal to them. Second row of eyes wider than first (22/18), narrower than third (22/28), the eyes separated by about two diameters. Clypeus equal in height to diameter of an anterior median eye. Chelicera with two subequal teeth on lower margin. Each tibia armed with three pairs of ventral spines below. Left leg I, 10.70 mm. long (coxa, 1.40 mm.; trochanter, .40 mm.; femur, 2.30 mm.; patella, 1.40 mm.; tibia, 2.00 mm.; metatarsus, 1.70 mm.; tarsus, 1.50 mm.). Left leg IV, 15.8 mm. long (coxa 1.60 mm.; trochanter, .50 mm.; femur, 3.50 mm.; patella, 1.60 mm.; tibia, 2.80 mm.; metatarsus, 3.80 mm.; tarsus, 2.00 mm.). For structure of epigynum see Fig. 2.

Type locality.—Alaska: Female holotype from Attu Island, June 9, 1937 (V. B. Scheffer, Collector).

Type.—U. S. N. M. Cat. No. 1370.

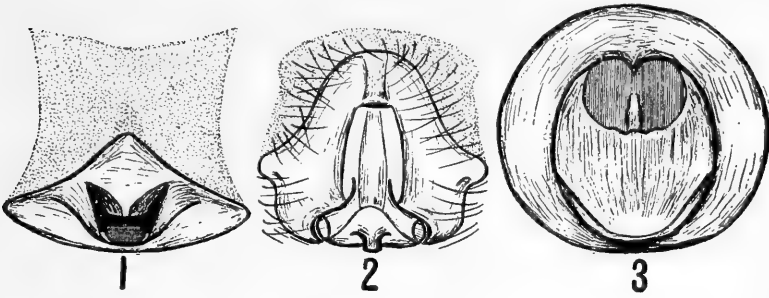
This new species may be separated from the other members of its genus by the structure of the epigynum.

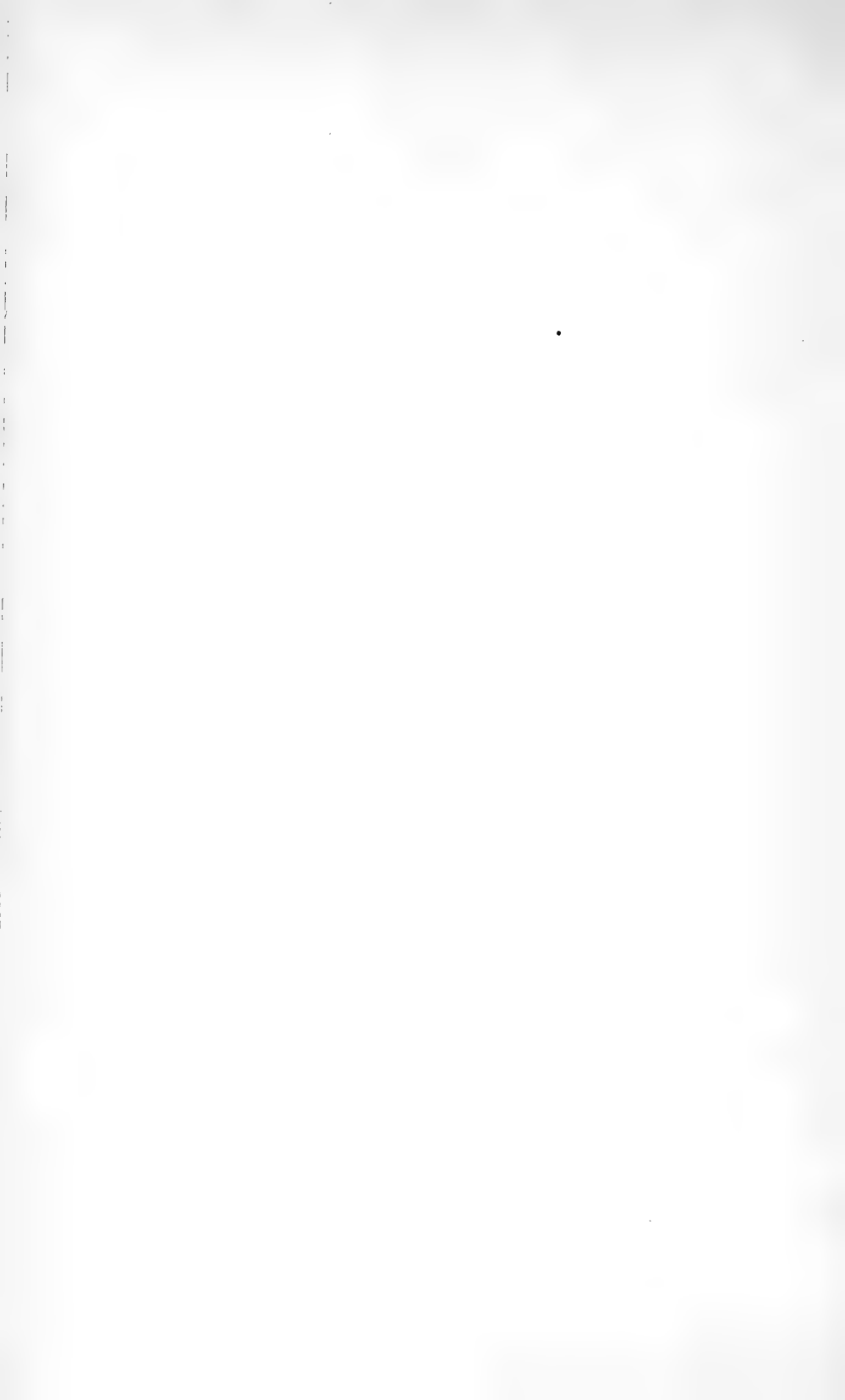
EXPLANATION OF ILLUSTRATION.

Fig. 1. *Theridion saylori*, new species, epigynum.

Fig. 2. *Tarentula aquilonaris*, new species, epigynum.

Fig. 3. *Steatoda merula*, new species, epigynum.





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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

FIVE NEW FORMS OF BIRDS FROM SOUTHERN ANNAM.

BY J. H. RILEY.¹

On account of war conditions in China, Dr. Joseph F. Rock left Yunnan early in 1939 and settled in Dalat, southern Annam, where he has been making bird collections for the U. S. National Museum. The first consignment of specimens contains some very interesting forms, among which may be mentioned *Otus senegalensis distans* and *Crocias langbianis*. The following five forms are believed to be worthy of separation and are herewith described:

Pericrocotus solaris deignani, subsp. nov.

Type.—Adult female, U. S. National Museum, No. 358855, Langbian Peaks, 2160 meters, South Annam, June, 1939.

Similar to *Pericrocotus solaris nassovicus* Deignan of southeastern Siam, but the throat grayish white without a yellow wash; the remainder of the lower-parts a lighter, clearer yellow; the back and lesser wing-coverts warbler green instead of neutral gray; head and neck above a lighter gray. Wing, 84; tail, 80; culmen, 13.

Male. Similar to the same sex of *Pericrocotus solaris nassovicus*, but the throat without the yellow wash and the lower parts on the average less intense orange.

Remarks.—This form is founded upon the type and five males taken in the mountains of southern Annam in the vicinity of Dalat. Named in honor of Mr. Herbert G. Deignan.

Pomatorhinus ochraceiceps alius, subsp. nov.

Type.—Unsexed, U. S. National Museum, No. 359059, Dran, 3000 ft., South Annam, July, 1939.

Similar to *Pomatorhinus ochraceiceps ochraceiceps*, but the tail darker above, the black area at the tip more extensive and extending further

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towards the base of the feathers; the tail beneath even has the black more extensive, very little brown showing except at the base and a narrow border at the tip. Wing, 97; tail, 109; culmen, 35.5 mm.

Remarks.—Dr. Rock only took the single specimen. It has been compared with five males and two females from northern Siam. Six of the latter (four males and two females), measure: wing, 87–97 (92.5); tail, 101–118 (113.9); culmen, 29–34 (32.2).

***Leioptila annectens eximia*, subsp. nov.**

Type.—Adult female, U. S. National Museum, No. 359014, Forests of Cam-ly, 5300 feet, South Annam, July, 1939.

Similar to *L. a. saturata*, but the back black; the crissum and rump deeper in color and the latter restricted in area not extending on to the back or wing coverts; a mere trace of concealed brown in the scapulars; the white streaks on the hind-neck obsolete and hardly noticeable; the white tips to the tail feathers more restricted; a few white barbs to the feathers of the supra-loral region and a few small white feathers on the upper eye-lid; longer upper tail-coverts black. Wing, 78; tail, 86; culmen, 15.5 mm.

Remarks.—The present form has been compared with eleven specimens of *Leioptila annectens saturata* from northern Siam. No specimens of *Leioptila annectens davisoni* have been available for comparison. Judging from descriptions, it must be very close, but it can hardly be the same, being confined to Mt. Muleyit, Tenasserim.

***Anthipes solitaria euroa*, subsp. nov.**

Type.—Adult male, U. S. National Museum, No. 359196, Dran, 3000 ft., South Annam, July, 1939.

Similar to *Anthipes solitaria submoniliger*, but darker above, the outside margins of the remiges and rectrices a brighter, redder brown (near russet instead of snuff brown). Wing, 64; tail, 46; culmen, 12.5.

Remarks.—Three specimens were taken at the type locality by Dr. Rock; one sexed as a female, the others unsexed, but clearly males. The U. S. National Museum has a female collected by C. Boden Kloss at Dalat, 4500 feet, South Annam. For comparison only a male from the Raheng District, Siam, has been available for comparison. The sexes of the Annam series are quite uniform and differ as described from the Siamese male.

***Tribura idonea*, sp. nov.**

Type.—Adult male, U. S. National Museum, No. 359220, Forests of Cam-ly, west of Dalat, 1600 meters, South Annam, June, 1939.

Similar to *Tribura taczanowskia*, but much darker above (Prout's brown); throat with small round black spots; wing shorter; tail longer.

Description.—Above Prout's brown, including the outer aspect of the wings; auricular region slightly lighter than the back; a narrow white supra-loral streak; throat white with small round black spots; breast and belly white, a band across the jugulum light cinnamon drab; sides and flanks

saccardo umber; under tail-coverts tawny-olive, the longer ones saccardo umber tipped with whitish; tail above olive brown with a grayish cast; tail below deep mouse gray, the shafts similar. Wing, 50; tail, 62.5; culmen, 10.5; tarsus, 18; middle-toe and claw, 17.5 mm.

Remarks.—Only the type taken, a breeding bird with the tail much worn at the tip. The tail would probably have measured more in an unworn state. All the measurements, except the tarsus, are smaller than those given by Hartert (*Vogel palaark Fauna*, I, heft 5, 1909, 542) for *Tribura taczanowskia*. Only a single male of the latter has been available for comparison.

A good series of *Tribura luteoventris* has been examined. *Dumeticola thoracica* does not belong in the genus *Tribura*, in my opinion.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW GEOGRAPHIC RACES OF BIRDS FROM
CENTRAL AMERICA.

BY ALEXANDER WETMORE.¹

The following descriptions of hitherto unrecognized races of birds from Guatemala and Honduras have been prepared during work on collections found in the United States National Museum.

Family CERTHIIDAE.

Certhia familiaris nubigena, subsp. nov.

Characters.—Similar to *Certhia familiaris alticola* G. S. Miller² but definitely darker above; the darker color predominating on upper back, dark markings blacker; brownish markings on upper back and scapular region deeper, more chestnut; averaging a little dark on the breast and abdomen.

Description.—Type, U. S. National Museum No. 349,708, male, from Desconsuelo, elevation 10,200 feet, Depto. Totonicapán, November 24, 1936, A. Wetmore, original number 9442. Crown, hindneck, and central area of extreme upper back black, the crown feathers with narrow streaks of pale cream-buff; superciliary streak cream-buff, broken slightly in front of eye, but extended forward to nostrils; many markings of cream-buff on sides of upper neck, connecting with superciliary; loreal region and space behind and below eye dull black, with many spottings of pale cream-buff, back with feathers cinnamon-brown, varying toward russet, with central and distal markings of pale olive-buff, and indistinct edgings of black; rump and upper tail-coverts russet; upper wing coverts sooty black; one or two spots of verona brown on outer lesser wing coverts, with larger spots of dull white on inner lesser coverts; greater coverts tipped with dull white; scapulars black, edged, lined and tipped with white; exposed portion of primaries and secondaries sooty black anteriorly, fuscous-black distally with an irregular spot of white extending across outer webs of primaries near center to and including the eighth, on inner primaries extending across both webs; a similar, broader spot across center of secondaries, being light

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² *Certhia familiaris alticola* G. S. Miller, Auk, 1895, p. 186 (State of Vera Cruz, Mexico).

buff externally and dull white internally; primaries edged narrowly with pale olive-buff, becoming white distally, tipped lightly with dull white; secondaries with distal edgings of olive-buff with a slight wash of russet, tipped with white; rectrices fuscous-black, outer one edged narrowly with dull white, others with deep olive-buff, which becomes olive-buff distally; throat white; breast, sides and abdomen smoke gray, merging through pale smoke gray to dull white on upper breast; flanks dull tawny; under tail-coverts cinnamon-buff; under wing-coverts pure white, with a small spot of dull black on edge of wing at base of tenth primary. Maxilla and tip of mandible black; base of mandible olive-buff; tarsus, toes and claws fuscous (from dried skin).

Measurements.—Males (4 specimens), wing 66.2–67.2 (66.8), tail 56.4–63.3 (59.9), culmen from base 15.5–16.7 (16.0), tarsus 15.0–16.0 (15.5) mm.

Females (2 specimens), wing 64.0, tail 58.8–60.0 (59.4), culmen from base 14.3–16.0 (15.1), tarsus 15.3–15.8 (15.5) mm.

Type, male, wing 66.2, tail 60.6, culmen from base 15.9, tarsus 15.6 mm.

Range.—Higher mountains of western Guatemala (specimens seen from Sierra Santa Elena, Desconsuelo, Hacienda Chancol, and Volcán de Fuego).

Remarks.—With a series of seven birds available, including five that I collected personally in 1936, it is easily evident that the creeper of the high forests of western Guatemala is distinct from *C. f. alticola* of southern Mexico. A skin from San Cristobal, Chiapas shows a slight tendency toward the southern bird, while one from Hacienda Chancol 25 miles northeast of Huehuetenango is not quite as dark as skins from Desconsuelo, Sierra Santa Elena, and Volcán de Fuego but is definitely *nubigena*.

Family COMPSOTHYLPIDAE.

***Basileuterus belli subobscurus*, subsp. nov.**

Characters.—Similar to *Basileuterus belli scitulus* but definitely darker, grayer, less greenish above; duller on the sides of the neck.

Description.—Type, U. S. Nat. Mus. No. 348,141, male, collected at Cantoral, Honduras, January 23, 1936. Crown and side of head between hazel and chestnut-brown; a broad superciliary stripe extending from base of bill along entire side of head lemon chrome; forehead and a streak on either side of crown bordering the superciliary black, this and the superciliary extending down the back of the head beyond the chestnut-brown; side of head including area entirely around eye between hazel and chestnut-brown, this color extending over the loreal region, where it is mixed distinctly with black; hind-neck, scapulars, and back, dull olive-green; rump and upper tail coverts, slightly brighter, near dark citrine; wing coverts dull olive-green; remiges fuscous with an edging of dark citrine on the inner primaries and secondaries, and a very light margin of citrine on the outer primaries; rectrices fuscous, margined with dark citrine; throat and breast between lemon yellow and lemon chrome with the sides of the neck and body washed with dull citrine; flanks yellowish citrine; lower abdomen and under tail coverts strontian yellow; under wing coverts dull citrine with a mixture of yellowish citrine on the bend of the wing. Bill dull black; tarsus and toes buffy brown (from dried skin).

Measurements.—Male (type), wing 60.1, tail 53.0, culmen from base 12.2, tarsus 12.7 mm.

Female, wing 58.5, tail 54.3, culmen from base 12.0, tarsus 20.7 mm.

Range.—Known from Cantoral, Honduras.

Remarks.—So far as I am aware this is the first record of the present species for Honduras, and it is only natural that the two specimens seen should differ from birds from Guatemala since similar differences are found in various other kinds of birds. The new race is represented by a female in addition to the type, taken at the type locality on January 25. The duller coloration is easily evident in both specimens.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF NEW LIZARDS AND SNAKES
FROM MEXICO AND GUATEMALA.

BY HOBART M. SMITH.¹

Among the reptiles collected in Mexico during the past year in pursuance of my studies of the Mexican herpetological fauna under grant from the Walter Rathbone Bacon Traveling Scholarship fund of the Smithsonian Institution, several new species and subspecies have been discovered which it is desirable to describe and name at the present time.

Ameiva undulata hartwegi, new subspecies.

Holotype.—U. S. National Museum No. 108600 (H.M.S. field No. 8208) from Chiapas, Mexico, directly across the Usumacinta River from Piedras Negras, Guatemala.

Diagnosis.—A subspecies of *Ameiva undulata* characterized by having small, irregular, median gular scales smaller than preanals or mesopterygials; preanals in two rows; lamellae under fourth toe 29 or more; femoral pores 18 or more.

Remarks.—This subspecies is the same as variety A of Hartweg and Oliver (Occas. Papers Univ. Michigan Mus. Zool., No. 359, 1939, p. 7), and also the same as *undulata parva* Smith (Occas. Papers Univ. Michigan Mus. Zool., No. 388, 1938, pp. 4-5).

The form is named for Doctor Norman Hartweg in recognition of his very important contributions to the understanding of the subspecies of *Ameiva undulata*.

Ameiva undulata stuarti, new subspecies.

Holotype.—U. S. National Museum No. 108601 (H.M.S. field No. 8809) from Palenque, Chiapas, Mexico.

Paratypes.—Thirty-nine specimens (H.M.S. field Nos. 8471-4, 8483-5, 8502-4, 8506-11, 8550-2, 8673, 8684-6, 8750, 8754, 8762-3, 8790-1, 8798-9, 8814-8, 8880, 8899, 8927), all from Palenque.

Diagnosis.—A subspecies of *Ameiva undulata* having a median row of

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enlarged gulars, the largest scale larger than any preanal or mesoptychial scale; femoral pores 13 to 18, average 15.45; lamellae under fourth toe 22 to 29, average 25.4; preanals usually paired (in two rows).

Variation.—The forty Palenque specimens show the following variation: Lamellae under fourth toe 22 to 29 (70 counts), average 25.4; femoral pores 13 to 18 (73 counts), average 15.45; first enlarged preanal single, in two, paired in 38; second preanal single in 15, paired in 25; in twenty-four specimens all preanals are paired (two rows).

Remarks.—The present subspecies is the same as *undulata undulata* Smith (Occas. Papers Univ. Michigan Mus. Zool., No. 388, 1939, pp. 5, 16), but not the same as *undulata undulata* Hartweg and Oliver (Occas. Papers Univ. Michigan Mus. Zool., No. 359, 1937, p. 7). The latter form is restricted by Hartweg and Oliver to Tehuán-tepec, and the typical subspecies of *undulata* is therefore that which occurs about Tehuán-tepec. The present series from Palenque is not the same, differing primarily in having two rows of preanals instead of one.

The subspecies *stuarti* differs from *hartwegi* in having a median row of enlarged gulars, the largest scale larger than any preanal or mesoptychial scale; femoral pores fewer; lamellae under fourth toe fewer.

The subspecies is named for Doctor L. C. Stuart in recognition of his work on *Ameiva*.

***Thamnophis rozellae*, new species.**

Holotype.—U. S. National Museum No. 108597 (H.M.S. field No. 8668) from Palenque, Chiapas, Mexico.

Paratypes.—U. S. National Museum Nos. 108598–108599 (H.M.S. field Nos. 8959–8960) from Aguacate, and U. S. National Museum No. 46549 from Montecristo, Tabasco, Mexico.

Diagnosis.—Stripes very dim; lateral stripes slightly evident on second and third scale rows anteriorly; belly light; scale rows 19 anteriorly, 17 or 15 posteriorly; ventrals 139 to 151; caudals 58 to 72; supralabials 7 or 8; 1 preocular; three rows of small dark spots on back, the outer row placed on first and second scale rows.

Description of holotype.—Female. Head scales normal; seven supralabials (a small scale wedged between second and third on one side), fifth largest, third and fourth entering eye; loreal quite small, the prefrontals extending downward on sides of head; infralabials 9, four in contact with anterior chinshields, which are about two-thirds the length of the posterior; preocular single; postoculars 3–4, temporals 1–3.

Scale rows 19 anteriorly and in the middle, 17 posteriorly, but with 21 rows about half-way between neck and middle of body; all dorsal scales keeled, those of outer row weakly; 140 ventrals; anal single; caudals 58. Total length 372 mm., tail 78 mm.

Ground color light brown (original scales; areas where scales have shed, light slate gray); head olive gray; a black line on the common sutures of the third and fourth, fourth and fifth, and fifth and sixth supralabials; a large, dark-edged, light-centered spot immediately behind the head, extending laterally and slightly posteriorly from the vertebral scale row to the second;

it is about two and one-half scale rows long; on the anterior border of the spot is a cream or yellow band about one scale wide, extending from ventral color to a point about three scales above corner of mouth; vertebral light stripe very dimly evident, practically absent; lateral stripe evident only as an area without dark spots, on second and third scale rows; three rows of alternating, poorly defined, small spots on each side, the row external to lateral light line placed on first and second scale rows; spots of outer row smaller than a single scale of the outer row; spots between lateral and middorsal stripes larger, poorly defined, about one scale in length and two and one-half in width on anterior part of body, smaller posteriorly; tail spots very small.

Chin yellow; belly yellow anteriorly, becoming suffused with slate posteriorly; ends of some ventrals with dark pigment on their posterior edges.

Variation.—The female paratype (U. S. National Museum 46549) and the two male paratypes (U. S. National Museum 108598-9) have the following scale counts respectively: scale rows 19-19-17, 19, 19-17-15-17, 19-19-15; ventrals 139, 148, 151; caudals 72, —, —; supralabials 8-8, 8-8, 7-7; infralabials 9-10, 9-9, 9-9; postoculars 3-3, 3-3, 3-4; total length 830 mm., 376 mm., 471 mm.; tail length 212 mm., 74+mm., 95+mm. The coloration is identical with that of the holotype.

Relationships.—The relatives of this garter snake, with which it must be compared, are *eques*, *sumichrasti* and *arabdotus*. From *eques* it differs in having no or very indistinct stripes and a lower ventral count (minimum 154 in *eques*, 139-151 in *rozellæ*). From *sumichrasti* it differs in lacking distinct stripes and in having 19 scale rows anteriorly (17 in *sumichrasti*). From *arabdotus* it differs in having a higher ventral count (140 or less in *arabdotus*), narrow labial bars (broad and distinct in *arabdotus*) and an indistinct middorsal stripe. From Guatemalan specimens referred by others to *eques* it differs in lacking the middorsal stripe.

It is practically certain that some of these forms will be united in one or two "formenkreisen." At the present time the difficulty lies in the clarification of the relationship of *sumichrasti* to *eques*. Until that and other problems can be solved, I prefer not to guess what subspecific relationship the present form may have.

The species is named for my wife, who discovered and captured the type.

***Xenodon mexicanus*, new species.**

Holotype.—U. S. National Museum No. 108596 (H.M.S. field No. 8108), male, from Piedras Negras, Guatemala, collected June 12, 1939.

Paratypes.—Two specimens from Potrero Viejo, Vera Cruz, Mexico, collected by Dyfrig McH. Forbes (Forbes Coll. No. 70, and E. H. Taylor—H.M.S. Coll. No. 5207).

Diagnosis.—A *Xenodon* with 19 scale rows at middle of body; maxillary teeth 12+2 or 13+2; subcaudals 35 to 42 (487); a light bar across top of head between anterior borders of orbits; ventrals 126 (124?) two 133. Total ventral count 167 to 168 (174?).

Description of holotype.—Head somewhat wider than neck, not depressed;

labial region somewhat flaring; rostral about twice as broad as deep, portion visible from above about one-eighth its distance from frontal; internasals somewhat broader than long, shorter than prefrontals; latter broader than long, extending onto sides of head; frontal somewhat shorter than its distance from end of snout, slightly longer than wide, slightly longer than interparietal suture; an indentation about in the middle of the lateral edge of each parietal; nasal divided, anterior section somewhat larger than posterior; loreal slightly higher than wide, quadrangular; one preocular; two postoculars; temporals 1+2; supralabials 7-8 (second and third fused on one side), fourth and fifth (third and fourth) entering orbit.

Mental with a labial border less than that of rostral; scales of first pair of infralabials in contact medially; ten infralabials, five (six) in contact with anterior chinshields; latter much longer than posterior chinshields; two pairs of small scales posterior to chinshields.

Dorsal scale rows 19-19-17; scales smooth, with a single apical pit; ventrals 126; anal single; subcaudals 42. Maxillary teeth 12+2. Hemipenis strongly bifurcate, basal section somewhat shorter than either lobe; sulcus divided at a point somewhat nearer base than point of bifurcation; entire organ, except extreme basal portion, spinose; distal spines somewhat smaller than proximal spines of lobe, all distinctly smaller than spines of basal section; spines of latter area increasing in size proximally; three spines nearest base of hemipenis considerably larger than others; no calyces.

Dorsal ground color olive gray; a series of thirteen crossbars on body, three on tail; crossbars somewhat darker than ground color, edged irregularly with dark brown and black, slightly constricted medially, each three to six scale rows long medially, six to eight laterally; dark edges of crossbars extending onto edges of ventrals; a small, diffused white area on the anterior and posterior median edges of some of the anterior crossbars; anterior crossbars divided posteriorly by a narrow light line which fails to reach the parietals by two scales; anterior to this point the two halves of the band fuse and extend anteriorly to the posterior edge of the prefrontals; a light line on each side extending from neck through the temporal region and across the supraocular, the lines uniting across the posterior part of the prefrontals; a faint dark line from superior posterior border of orbit to angle of jaw; snout speckled with black; sides of head with indefinite darker and lighter areas.

Chin immaculate cream; belly and tail lighter cream, with small, scattered dark brown spots of irregular outline.

Total length 548 mm., tail 90 mm.

Variation.—The largest paratype (E.H.T.—H.M.S.) has fifteen crossbars on the body, three on the tail; the coloration is similar to that of the type, except that the sides and belly are more heavily stippled with black; the markings on the nape and posterior part of the head are very indistinct. Supralabials 8-8; ventrals 133; subcaudals 35; total length 587 mm.; otherwise as in type.

The small paratype (Forbes), measuring 163 mm. in total length (tail 23 mm.), shows a remarkably different coloration. The crossbars (14 on body, 3 on tail) are very distinct, dark brown in color, with black edges;

they completely encircle the body (not on tail, which is white below) and moreover are fused medially on the belly. The head markings are as in the type, except that dark bars are present on the sutures of the supralabials. Supralabials 8–8; infralabials 9–10; ventrals 129; caudals 38; otherwise as in type.

Remarks.—The species is closely related to *colubrinus* and may be a subspecies of it. They differ markedly in ventral count, *mexicanus* having 124 to 133 (11 counts), *colubrinus* 141 to 153 (19 counts).

Scale counts of specimens from Guatemala discussed by Stuart (Occas. Papers Univ. Michigan Mus. Zool., No. 292, 1934, pp. 15–16, and No. 29, p. 51), and by Boulenger (Cat. Snakes Brit. Mus., vol. 2, 1894, p. 147, specimens *o*, *p* and *q*), from British Honduras and Amula, Guerrero, indicate that these also may be referred to *mexicanus*. The specimen listed by the latter author (*loc. cit.*) from San Gerónimo, Guatemala, does not seem to belong here (ventrals 144, caudals 39).

The type was found in short grass in camp at a late hour in the afternoon.

I am indebted to Mr. Dyfrig McH. Forbes for permission to study his specimen of the species, and to Doctor Edward H. Taylor for calling my attention to the distinctness of the Mexican specimens.

***Coniophanes bipunctatus biseriatus*, new subspecies.**

Holotype.—U. S. National Museum No. 108595 (H.M.S. field No. 8800), male, from Palenque, Chiapas, Mexico.

Paratypes.—Three specimens (H.M.S. field Nos. 8932, 8954–5) from the type locality.

Diagnosis.—Related to *bipunctatus*, differing in having the inner edge of the lateral dark stripes scalloped, or the lateral stripes enclosing two rows of dark spots between them; middorsal dark stripe distinct; subcaudals in males 97 to 100, in females 91 to 95.

Description of holotype.—General details of scutellation as in *bipunctatus*; eight supralabials, fourth and fifth entering eye; eleven infralabials; one preocular; two postoculars; temporals 1 + 2; two pairs of chinshields, subequal in size; six infralabials in contact with chinshields.

Maxillary teeth 17, the two posterior grooved; hemipenis as in *bipunctatus*. Scale rows 21–21–17; ventrals 133; subcaudals 100; anal divided. Total length 363 mm., tail 125 mm.

Sides of head black; dorsal surface of head black, with irregular lighter areas of brown; a fine, broken white line extending from sides of prefrontals across upper preocular to lower secondary temporal; another line, more nearly complete, extending from lower edge of nasal across angle of mouth onto sides of neck; a dark middorsal line one scale wide anteriorly, one-third of a scale wide posteriorly, disappearing at base of tail; back light brown, sides somewhat darker; an interrupted dark line on fifth scale row, extending onto tail; a row of dark brown spots involving the fifth, sixth and seventh scale rows on each side, most of the spots fused with the darker lateral color, producing a scalloped median edge on the lateral dark stripe; the series of spots disappearing on posterior part of body, absent on tail; a fine white line on third scale row, dropping to the second scale row on posterior

fifth of body; another light line on first scale row, disappearing posteriorly at the point where the light line of the third scale row drops to the second.

Belly and tail white; edges of ventrals and subcaudals with a black spot; a regular series of large black spots on either side of the mid ventral line; scales of throat black-edged; a black spot about in the middle of each chinshield.

Variation.—The three paratypes are very young specimens, all taken from eggs before hatching. However, all show the distinctive color pattern of the type. In one (8932) the spots are fused with the lateral dark band as in the type; in the other two they are free of the lateral band except at the nape. The scale counts of 8932, 8954 and 8955 respectively, are: ventrals 133, 137 (♀ ?), 140 (♀ ?); subcaudals 97, 91, 95; total length 131 mm., 122 mm., 135 mm.; tail length 43 mm., 41 mm., 45 mm.

Remarks.—Present records of *bipunctatus* demonstrate two geographical groups: one including Tehuán-tepec and Central Veracruz, the other including a small area of Guatemala, British Honduras and Honduras. The present specimens are the only ones known from a locality between these two areas.

The holotype was found in a grassy ravine under a log partially submerged in moist soil near the exit of a spring. The three paratypes were taken from eggs found July 20 in a rotten stump on the bank of a stream. Five eggs were in the original clutch. One was opened immediately, but the embryo was too young to be of importance. Another egg was opened on August 5 (8932), and two others on August 9 (8954-5). The embryo in the final egg was too decomposed on August 16 to preserve. It also, however, showed the characteristic pattern of this subspecies.

The present subspecies differs from *bipunctatus* solely in the pattern and in the higher subcaudal count. Subcaudals in male *bipunctatus* are 92-94 (97-100 in *biseriatus*); in females of *bipunctatus* the subcaudals range from 84 to 88 (91 to 95 in *biseriatus*).

Genus TANTILLA Baird and Girard.

This genus has been characterized as a group of snakes having 12 to 14 equal maxillary teeth followed posteriorly by two somewhat enlarged, grooved teeth. Many species of the genus can be characterized thus, but that the description will not fit all its members came to my attention upon dissection of a specimen from Guatemala which could not be identified with any described species. This specimen has, as nearly as I could determine, 23 maxillary teeth on one side, 25 on the other, counting the posterior pair of very feebly enlarged, very weakly grooved teeth. The posterior teeth have such feeble grooves that for some time I was under the impression that all the teeth were solid. The condition was so peculiar that I examined the teeth of all other species represented in collections at hand—*atriceps*, *bocourti*, *brevissima*, *calamarina*, *coronata*, *eiseni*, *gracilis*, *martindelcampoi*, *nigriceps nigriceps*, *rubrum*, *schistosa* and *wilcoxi*.

Two different types of dentition are shown in these species. In one type the grooved teeth are in line with the others, there is no noticeable diastema preceding them, and they are but slightly enlarged. Three species demon-

strate this type: *lintoni* (with 23 to 25 teeth), *brevissima* (22), and *calamarina* (12).

In the second type the grooved teeth are not in line with the other teeth (i. e., set off slightly to the outer side), they are considerably larger than the others, there is a small but distinct diastema preceding them, and the grooves are much more distinct than in the other type. All the other species fall into this group. In those examined the number of teeth varies between 13 (*martindelcampoi*) and 17 (*schistosa*).

***Tantilla lintoni*, new species.**

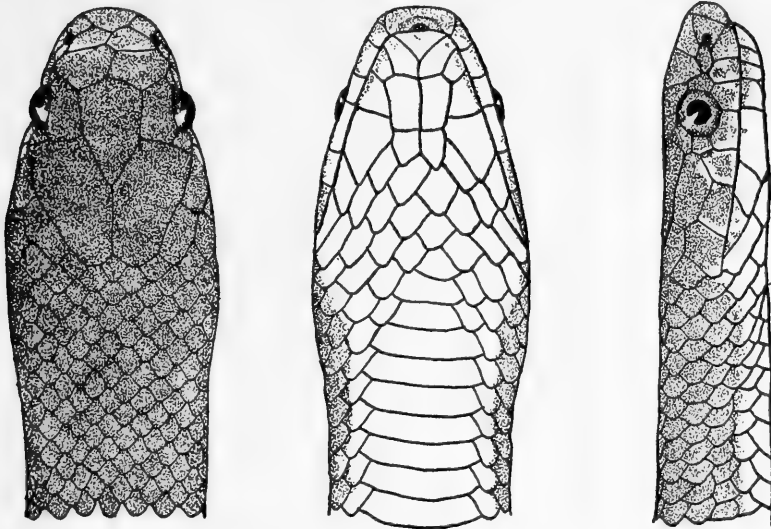


Fig. 1. *Tantilla lintoni*, sp. nov. Type. Much enlarged.

Holotype.—U. S. National Museum No. 108603 (H.M.S. field No. 7460), female, from Piedras Negras, Guatemala, at a locality some 45 miles by trail from Tenosique, Tabasco, Mexico, on the bank of Usumacinta River; collected May 24, 1939.

Diagnosis.—Dark brown above, white below, the dark dorsal color ending abruptly on extreme lateral edges of ventral scales; ventrals 116; subcaudals 47; anal divided; eye extremely large, its diameter nearly two-thirds its distance from tip of snout; seven supralabials; two postoculars; one preocular; first infralabials broadly in contact medially.

Description of type.—Frontal hexagonal, its greatest width slightly less than twice the greatest width of the supraocular, its greatest length two-fifths greater than its distance from end of the snout and four-fifths the greatest length of the parietal. Prefrontals nearly twice as long as internasals; rostral much broader than high, length of portion visible from above about half its distance from frontal; prefrontal narrowly separated

from supralabial on each side; nasal divided, the posterior section a third the size of the anterior; one preocular, in contact with nasal; two post-oculars; supralabials seven, third and fourth entering orbit, seventh largest and highest; temporals 1 + 1.

Infralabials six, four touching the anterior chinshields, one (fourth) touching posterior chinshield; mental with a labial border equal to that of rostral, separated from the chinshields by broad contact of the anterior infralabials; posterior chinshields two-thirds the length of anterior, or less; three pairs of small scales (as large as posterior chinshields or larger) follow the chinshields.

Ventrals 118; anal divided; subcaudals 47; scale rows 15; maxillary teeth nearly equal, 23 on one side, 25 on the other; the two posterior teeth very feebly grooved, feebly enlarged; total length 207 mm., tail 54 mm.

Head dark brown; centers of dorsal scales on body and tail lighter brown; a narrow edge around each dorsal scale dark brown; the difference in shade between the light central and dark surrounding color of each scale is more apparent to the naked eye than under the microscope, and might not be apparent in other specimens under certain conditions; venter cream color; dark dorsal color extending on extreme lateral tips of ventrals, there terminating very abruptly in a continuous, serrate line; snout and supralabials with unpigmented areas not well defined; some dark pigment on three anterior supralabials, very little on mental.

Comparisons.—*Tantilla canula* from Yucatán is somewhat similar (according to descriptions), but appears to differ in having the mental in contact with the chinshields, ventrals and subcaudals somewhat less numerous (105–110 ventrals, 37–41 subcaudals), and in having pigment on the belly as well as on the back. *Tantilla breve* from British Honduras differs in having the eye less than half the length of the snout, internasals more than half as long as prefrontals, frontals scarcely longer than broad, and perhaps in coloration. One of the most distinctive characters of the present species may very possibly be the large number of maxillary teeth.

Remarks.—The type was found at night, moving about in leaves on the ground in heavy forest.

The species is named for Mr. Linton P. Satterthwaite, whose kindness enabled us to collect for a considerable length of time at the archeological station at Piedras Negras.

***Trimeresurus garciai*, new species.**

In the excellent herpetological collection from the states of Veracruz and Puebla that has been assembled recently by Mr. Dyfrig McH. Forbes and Sr. Gabino García of Potrero Viejo, Veracruz, perhaps no species comes as a greater surprise than this. Three specimens, one of which has very kindly been presented to me and another to Edward H. Taylor, were secured by one of these collectors near Cacaloapam, Puebla, on a semi-arid plain. The exact spot is near kilometer 226. All were found during the process of excavating mounds of *Mammillaria cacti* in search of *Eleutherodactylus cactorum*.

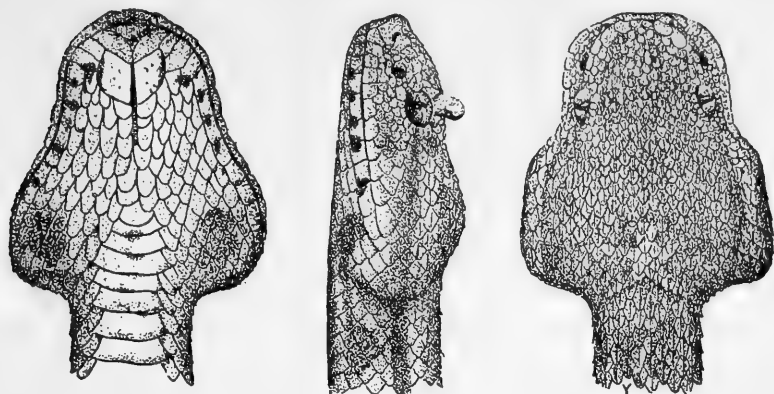


Fig. 2. *Trimeresurus garciai*, sp. nov. Details of cephalic scutulation, enlarged.

It is a pleasure to name the species in recognition of the most enthusiastic and persistent collector, Sr. Gavino García, who secured the specimens.

Holotype.—Dyfrig McH. Forbes Coll. No. 882, male from near Cacaloapam, Puebla, Mexico, on a semi-arid plain near kilometer 226.

Paratypes.—U. S. National Museum No. 108602 (H.M.S. field No. 11526) and E.H.T.—H.M.S. Coll. No. 21489, both from the type locality.

Diagnosis.—Subcaudal scales entire; a vertical horn-like scale, with an inner groove, over eye; scales in 21 rows; ventrals 146; subcaudals 40; supralabials 10 to 12, none entering pit.

Description of holotype.—Head nearly three times as broad as neck; snout rounded, seen from above, slightly projecting in profile; rostral about twice as broad as high, projecting very slightly above edge of upper head scales; four convex internasals bordering rostral, the two median much smaller than the one on either side; nasal divided, the anterior section about twice as large as posterior, in contact with first supralabial; three scales forming inner edge of pit; two rows of small scales between pit and labials; one or two scales between pit and nasal; three rows between pit and eye; three or four rows between eye and labial; four canthals; median supraocular produced vertically as a broad "horn" three mm. high, 2.2 mm. long, and about a millimeter wide; horn with a deep vertical groove on inner surface and two or three shallow grooves on outer surface, radiating from base; scale preceding this somewhat larger than scales in frontal region, its posterior edge produced slightly upward against anterior edge of the horn; eleven rows of scales between horns; scales on sides of head not keeled, those on lower temporal region quite smooth and flat, others convex; lower temporal scales somewhat larger than or nearly the same size as posterior supralabial; dorsal head scales small, those posterior to frontal region heavily keeled and with small ridges radiating from the median keel of each scale; anterior dorsal head scales not keeled their full length, but with a prominent posterior knob; supralabials and infralabials eleven.

Mental with a labial border somewhat greater than that of rostral; scales of first pair of infralabials in contact behind mental; one pair of chinshields, not much longer than broad; three labials in contact with chinshield; five pairs of small scales following chinshield, then one small median scale; all ventral scales smooth, flat.

Dorsals in 23-21-17 rows, those of outer row not keeled, those of second row very weakly keeled, others rather strongly keeled; ventrals 146; anal entire; subcaudals 40, all entire.

Color.—General ground color light tan, very slightly suffused with pink, rather heavily stippled with dark brown; a series of diagonal brown blotches, sometimes dark-edged anteriorly, down middle of back; blotches extending over six to eight rows of scales transversely, about three longitudinally; they are connected diagonally by narrower extensions of the same color about one and one-half to two scales wide, so that the general effect is a zigzag line down the back; small dark blotches, arranged in two rows, very dimly evident on the sides; a light postocular stripe, one and one-half to two scales broad, not sharply defined, extends from eye through temporal region onto anterior part of neck, there disappearing; below this a somewhat narrower dark brown stripe which involves the upper half of the posterior supraocular and disappears on side of neck; supralabials light except anterior scales; a dim, somewhat star-shaped light mark on occiput; upper surface of head otherwise dark brown.

Infralabials, except anterior ones, pinkish cream, stippled with dark brown, and with a few well-defined small, very dark spots irregularly arranged; another dark spot, larger but not so well defined, on postero-lateral gular region. Mental and anterior infralabials gray, heavily pigmented; other ventral head shields with scattered pigment. Belly and ventral surface of tail heavily pigmented, more posteriorly than anteriorly, with scattered light areas. Dorsal surface of tail nearly uniform dark brown, nearly black, the color extending onto ends of subcaudals; a brilliant white line extending from base of tail along second scale row to tip of tail, descending posteriorly until it lies upon the lateral edges of the subcaudals; a narrow, transverse white band across base of tail near anus.

Variation.—In ventral and caudal counts the series is amazingly uniform. All have 146 ventrals, and the two with complete tails have 40 caudals (both males).

In the two paratypes (U. S. National Museum and E.H.T.—H.M.S. respectively) the scale rows are 25-21-17, 23-21-17; supralabials 12-14, 10-11; infralabials 11-11, 11-12; scales between "horns" 13, 10; total length 407 mm., 449 mm.; tail 55 mm., 51 mm.

The dorsal pattern of the female is obscure.

Comparisons.—The species is somewhat similar to *Trimeresurus undulatus*, but differs markedly in having entire instead of divided subcaudals, as well as in other less obvious characters. There seems to be no other described species similar to it.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONTWO NEW GEOPHILOID CHILOPODS FROM MEXICO
AND TEXAS.

By RALPH V. CHAMBERLIN.

Of the two new chilopods herein described the first is a member of the Schendylidae and is represented by two specimens sent to me for identification by Mr. E. J. Koestner of the University of Illinois, by whom they were taken at an elevation of 12,500 feet on Cerro Potosi, Nuevo Leon, Mexico. The type of the second form represents a new species in the genus *Sogona*, family Sogonidae. It was taken in Kerr Co., Texas, by Dorothea and Stanley Mulaik in December, 1939.

Simoporus koestneri, new species.

Cephalic plate longer than broad, narrowed toward both ends, the caudal margin truncate. No frontal suture showing. Prebasal plate clearly exposed. Antennae filiform.

Claws of prehensors when closed even with or slightly short of the anterior margin of the head; none of the joints armed within. Anterior margin of coxosternum unarmed. No chitinous lines present.

Anterior sternites with posterior margin angularly produced into an excavation of the succeeding plate. Sternites not sulcate. Ventral pores in an undivided circular area, this relatively small.

Spiracles small, circular, the first but slightly larger than the second.

First legs but little smaller than the second. Anal legs in the male much thicker and longer than the penult, the third joint thickest, from which the legs are attenuated gradually to the end; claw distinct, slender.

Labrum widely and evenly arched over middle portion, this concave middle portion bearing typically 15 stout teeth; widely separated pectinations on each side, the outermost of these close to end of labrum.

The inner branch of first maxillae presenting two setae, as against three shown for *Nyctunguis dampfi*, and the outer branch or palpus four setae as against three. Otherwise the first maxillae very similar to those of that species.

The clypeus free from setae posteriorly; at anterior end a pair of setae

and behind this several setae irregularly arranged at three levels, with setae on each side tending to form a single series.

Last ventral plate proportionately broad, trapeziform. Each anal coxa with a single large pore which is nearly covered by the border of the sternite.

Genital appendages large, the apical article conical, setose, extending a little beyond caudal end of somite.

Pairs of legs in male, 41.

Length, 18 mm.

Locality.—Mexico: Nuevo Leon, Cerro Potosi, at an elevation of 12,500 ft. Two specimens collected by E. J. Koestner in soil in scrub pine growth. One specimen lacks the posterior end.

This species presents many resemblances to *Nyctunguis dampfi* (Verhoeff) the types of which were also taken in Mexico in the high mountains, having been taken by Prof. Dampf at the Desierto de los Leones at an elevation of 9,000 feet.

***Sogona kerrana*, new species.**

Antennae moderate, attenuated from base where they are nearly contiguous. No frontal suture. Prebasal plate a little exposed at the middle.

Claws of prehensors when closed not quite reaching the anterior margin of the head. Joints of prehensors not armed within. Chitinous lines complete.

Ventral pores of anterior sternites few, in the usual narrow transverse band behind middle of sternite.

Spiracles all circular, the first but little larger than the second.

Last ventral plate wide. Pores of anal coxae large, two on each side, mostly exposed.

Anal legs in the male moderately inflated, of nearly uniform thickness to the second tarsal joint which is abruptly thinner. Tarsus terminating in a membranous point, without a true claw.

Pairs of legs in male holotype, 57.

Length, about 25 mm.

Localities.—Texas: Kerr Co., Turtle Creek, one male taken in December, 1939; Raven Ranch, one younger male, also taken in December, by D. and S. Mulaik.

Much resembling *Garrina ochra* in the form of the anal legs excepting in the lack of terminal claws. It is a much larger form than *Sogona minima* from which it differs also in lacking the deep median longitudinal furrow on the sternites characteristic of *minima*, etc.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ON THE MOLLUSCAN GENUS TRIMUSCULUS
SCHMIDT 1818, WITH NOTES ON SOME
MEDITERRANEAN AND WEST AFRICAN
SIPHONARIAS.

BY HARALD A. REHDER.

Trimusculus was proposed as a new generic name for several *Patellas* on page 218 of the rare work by Fredrich Christian Schmidt, entitled, in brief, "Versuch über die beste Einrichtung . . . der Conchylien-Sammlungen . . .," Gotha, 1818. The diagnosis given here is adequate enough so that we know that he was separating the air-breathing limpet-like mollusks that we know as *Gadinia* and *Siphonaria*, from the gill-bearing marine forms. Moreover, he lists as belonging to his new group thirteen species of *Patella*, namely, *Patella mammillaris* Linné, *melanoleuca* α , *melanoleuca* β , *leucopleura* α , *leucopleura* β , *leucopleura* δ , *striatula* of Gmelin, and *castanea*, *filaris*, *calix*, *serrata*, *strigosa*, *strigosissima* of Schröter.

The *Patella mammillaris* Linné is, according to Hanley, the Mediterranean *Gadinia garnotii* Payr. *Patella melanoleuca* Gmelin is the West African *Siphonaria*, that has been called *lineolata* Orbigny, although this name must be restricted to the Caribbean species. *Patella melanoleuca* β is probably also a *Siphonaria*, judging from Schröter's brief description to which Gmelin refers. *Patella striatula* Gmelin is likewise a *Siphonaria*. *Patella leucopleura* Gmelin is a West Indian *Acmaea*, while *leucopleura* β and δ are more or less indeterminable, the variety β being possibly a *Siphonaria*. I have been unable to find a description of the species credited here to Schröter.

Since the position of this genus, to which Iredale has recently called attention (British Museum Great Barrier Reef Exped. 1928-29, Scientific Reports, vol. 5, no 6, Mollusca, pt. 1, 1939, p. 274) must be fixed, I designate as genotype the species *Patella mammillaris* Linné, which will bring about the substitution of *Trimusculus* Schmidt for *Gadinia* Gray; the designation

of any of the other recognizable species would cause the upsetting of the more widely used name *Siphonaria*.

Herrmannsen synonymized the genus with *Siphonaria*, since he dated the name from 1832, its appearance in Möller's description of the collection of Schmidt at Gota. Here (see reference below), Möller gives a brief but sufficient description, but mentions no species. Marshall, in 1873, lists *Trimusculus* with the correct citation, but von Martens, who worked on the molluscan names in this work, apparently did not accept the genus, as he also places it under *Siphonaria*.

TRIMUSCULUS Schmidt.

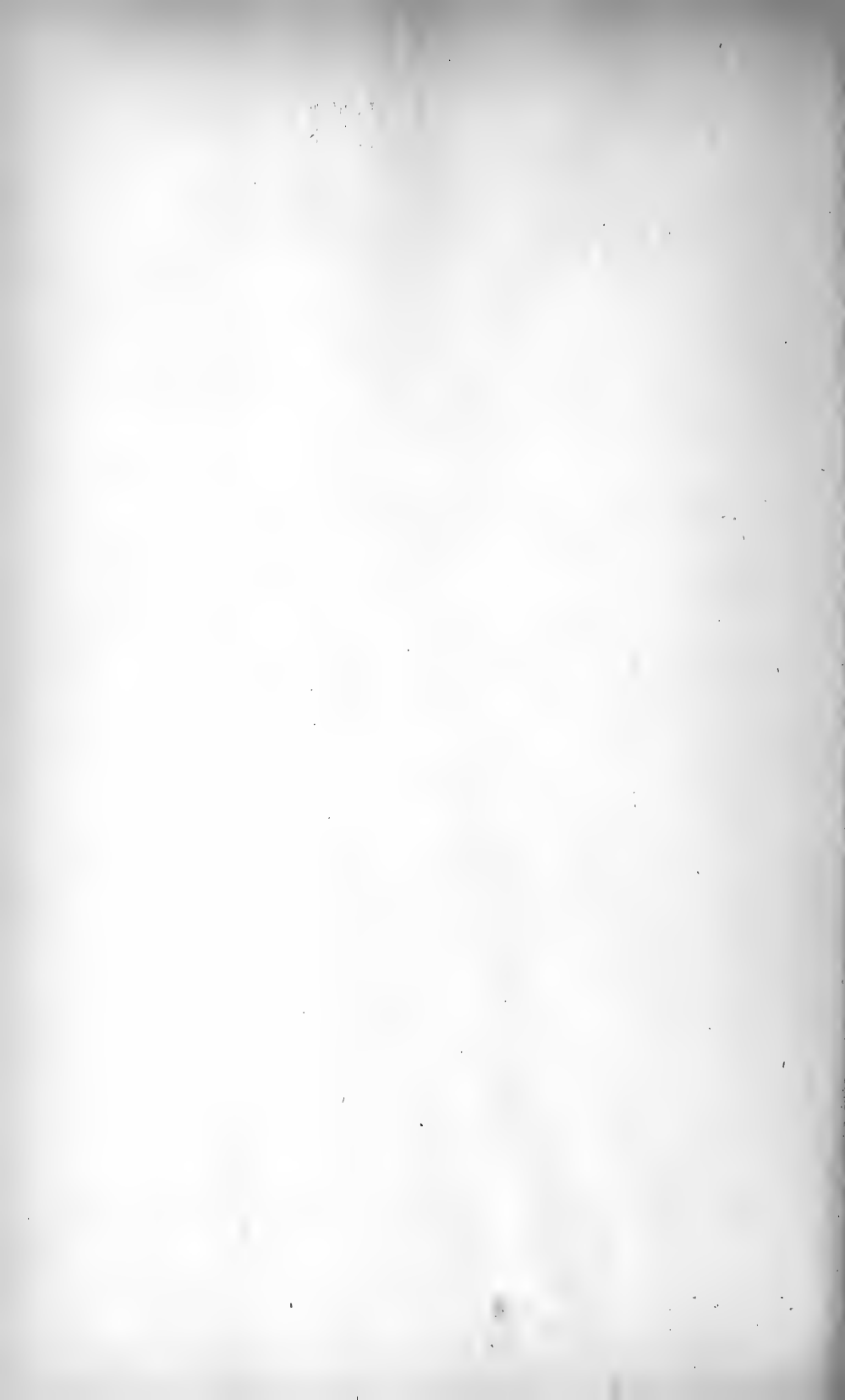
1818. *Trimusculus* Schmidt, Versuch . . . Einrichtung . . . Conch.—Samml., p. 218.
 1832. *Trimusculus*, Möller, Isis (von Oken), vol. 25, p. 132.
 1849. *Trimusculus*, Herrmannsen, Ind. Gen. Malac., vol. 2, p. 601.
 1873. *Trimusculus*, Marschall, Nomenclator Zool., p. 143.
 1824. *Gadinia* Gray, Tilloch's Phil. Mag., vol. 63, p. 275.
 1833. *Clypeus* Scacchi, Oss. Zool., vol. 2, p. 27.
 1835. *Mouretia* Sowerby, Proc. Zool. Soc. L., 1835, p. 6 (nomen nudum).
 1842. *Mouretia*, Sowerby, Man. Conch., ed. 2, p. 192.
 ? 1864. *Rowellia* 'Cooper' Carpenter, Rept. Brit. Assoc. Adv. Science for 1863, p. 651.
 ? 1865. *Rowellia* 'Cooper' Gabb, Proc. Calif. Acad. Sci., p. 188.

Genotype (here designated): *Trimusculus mammillaris* Linné (*Patella mammillaris* Linné).

Linné, after his brief description of *Patella mammillaris*, which he says is found in the Mediterranean Sea, cites figures in Lister and Klein as representing his species. Klein's figure, which is a copy of that of Lister, is cited also for the following species, *Patella pectinata*, which likewise is said to come from the Mediterranean. Thus we have two species illustrated by the same figure, which is that of a West African *Siphonaria*, the *Mouret* of Adanson. But not only does the description of *Patella pectinata* fit this West African species better than does *P. mammillaris*, but the specimen marked for this species in the Linnean cabinet is, according to Hanley, the *Mouret* of Adanson. Hanley's indifferent figure of this Linnean specimen represents the western Mediterranean form long called *Siphonaria algesirae* R. & G., and similar enough to the West African form to be confused with it. The latter shell, from Liberia, Cape Palmas and southward, is more finely ribbed, and must bear the name *Siphonaria grisea* (Gmelin), while the more coarsely ribbed form, resulting in the internal brown lines being heavier and more widely spaced, from the western Mediterranean and the Cape Verde Islands, will be called *Siphonaria pectinata* (Linné). In regard to *Patella mammillaris* we therefore must disregard the cited figure which represents another Linnean species, and follow Hanley, who fixes the name on a specimen in the Linnean collection of the Mediterranean, *Gadinia garnotii* Payraudeau, and the description, brief though it be, fits this species better than it does the darker, stouter *Siphonaria*.

Weinkauff¹ maintains that Linné's description and Hanley's figure do not agree with Payraudeau's description in that the latter says his species is longitudinally and transversely striated, whereas Linné does not mention any transverse sculpture, and Hanley's figure shows only distant growth lines. But Payraudeau's figures likewise show only three to four spaced growth lines, which apparently represent his transverse sculpture, and an examination of numerous specimens in the Jeffreys collection shows the only transverse sculpture is that of the very variable growth lines. In some specimens the growth lines only inconspicuously affect the radial rib; in others, the shell is strongly marked by interruptions in the growth, and the radial riblets may often be conspicuously nodulose.

¹ Die Conchylien des Mittelmeeres, vol. 2, 1868, pp. 175-176.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW SPECIES OF HELIOPSIS (ASTERACEAE)
FROM SOUTH AMERICA.

BY S. F. BLAKE.

The two new species of *Heliopsis* here described have been held in manuscript for several years. A note identifying a species of this genus wrongly described by Klatt as a *Gymnolomia* is appended.

***Heliopsis lanceolata* Blake, sp. nov.**

Herba perennis erecta v. adscendens; caulis tenuis bifariam pilosus; folia opposita remota anguste lanceolata longe acuminata basi acute cuneata petiolata triplinervia calloso-serrulata utrinque dense subappresso-hirsutula; capitula majuscula radiata terminalia solitaria longe pedunculata; involucri 6-8 mm. alti phyllaria oblonga herbacea calloso-apiculata dense pilosiuscula; achenia disci parva oblonga quadrangularia apice truncata non striata.

Erect or ascending perennial herb, single-stemmed, with a few short leafy branches from the base; stem subterete, striate, 1.5-3 mm. thick, purplish or purplish brown, densely gray-pilose with matted hairs in two lines and sparsely pilose or nearly glabrous elsewhere, glabrescent below, bifurcate or few-branched, with erect branches; internodes 2.5-10 cm. long; leaves often with short leafy branches in their axils; petioles slender, unmarginated, 1-2 cm. long, sulcate above, densely pubescent in the sulcus; blades narrowly lanceolate, 4.8-8.5 cm. long, 6-16 mm. wide, callous-serrulate chiefly above the base and below the apex (teeth acute or acutish, 0.3-1 mm. high, 3-10 mm. apart) or the smaller subtire, firm-papery, about equally green on both sides, densely subappressed-hirsutulous on both sides and with some longer hairs especially along the margin and the chief veins beneath, the bases of the hairs sometimes glanduliform; peduncles solitary at tips of stems and branches, slender, 14-22 cm. long, pubescent like the stem below, above densely subtomentose-pilose with spreading or erectish ochroleucous hairs; heads 2.8-5 cm. wide (as pressed); disk 1-(fruit) 1.5 cm. high, 1.2-1.5 cm. thick; involucre 2-seriate, ob-graduate, appressed, the outer phyllaries unequal, oblong or oblong-oblanccolate, acute or acutish, conspicuously callously-tipped, herbaceous,

densely pilosulous with ochroleucous hairs, the inner phyllaries shorter, oblong, acute or acuminate, thinner, subchartaceous, glabrous or slightly puberulous; rays about 14-18, golden yellow, fertile, the lamina oblong, bluntly 2-3-denticulate, about 14-nerved, sessile, persistent, puberulous at base, glabrous on back, 19-23 mm. long, about 6 mm. wide; disk corollas yellow, glabrous or subglabrous, 4.4 mm. long (tube 0.7 mm., throat slenderly subcylindric, 3 mm., teeth ovate, acutish, recurving, 0.7 mm. long); pales lance-oblong, obtuse or acute, essentially glabrous, narrowly keeled, 3-vittate, thickened toward apex, brownish yellow above, 6 mm. long; ray achenes (submature) obovoid, trigonous, about 1-nerved on each face or nerveless, sparsely hispidulous above chiefly on the angles, 3 mm. long, 1.5 mm. wide; disk achenes oblong, bluntly quadrangular, nerveless or weakly 1-nerved on the faces, dull, glabrous, truncate at the obscurely crenulate apex, 2.5 mm. long, 1-1.2 mm. wide.

COLOMBIA: Open rocky hillsides, vicinity of Vetas, Dept. Santander, Eastern Cordillera, alt. 3100-3250 m., 16-20 Jan. 1927, *E. P. Killip & A. C. Smith* 17339 (type no. 1,352,958, U. S. Nat. Herb.); in thicket, same locality and date, *Killip & Smith* 17905.

A species of the *Heliopsis buphthalmoides* group, readily distinguished by its narrowly lanceolate acuminate leaves.

***Heliopsis decumbens* Blake, sp. nov.**

Herba perennis rhizomatosa decumbens 8-10 cm. alta; caules pauci breves patenter pilosi; folia opposita paucijuga elliptico-oblonga v. elliptico-ovata obtusa basi cuneata petiolata crenato-serrata triplinervia praecipue infra patenti-hirsuta; capitula mediocria solitaria longe pedunculata aurea radiata; involucri 2-seriata ca. 8 mm. alti obgraduati phyllaria exteriora oblonga v. oblongo-obovata obtusa 3-nervia herbacea pilosa; radii ca. 15 aurei ca. 12 mm. longi; achenia disci obovoidea paucinervia truncata epapposa.

Low herb, with prostrate branching rhizome (up to 10 cm. long or more), short decumbent stems, and relatively long ascending or erectish terminal peduncles; leafy part of stem about 2.5-4 cm. long, subterete, striate or sulcate, greenish, more or less densely pilose with spreading or partly subappressed hairs sometimes arranged more or less in lines, in age glabrate or glabrescent; internodes 5-10 mm. long; leaves in about 4 pairs; petioles rather broad, more or less pilose, 5-7 mm. long, obscurely margined essentially to base, connate at base; blades 2.5-3.5 cm. long, 1-1.5 cm. wide, obtuse, bluntly and obscurely callous-apiculate, at base cuneately decurrent into the petiole, crenate-serrate chiefly above the cuneate lower part (teeth about 5-7 pairs, about 0.3 mm. high, mostly 2-3 mm. apart, obtuse or acutish, callous-tipped), above glabrous or sparsely short-hirsute, sparsely or rather densely hirsute or hirsutulous on margin, beneath hirsute on chief veins and sometimes sparsely so on smaller veins and surface; peduncle slender, pilose with spreading or upcurved hairs, densely so below the head, 4-7 cm. long; head 3 cm. wide; disk about 1.3 cm. wide, 8-10 mm. high (as pressed); involucre hemispheric, 7-9 mm. high, appressed, 2-seriate, the outer phyllaries about 7, oblong or obovate-oblong, obtuse, obscurely

callous-tipped, sparsely to rather densely pilose with spreading to erectish hairs, herbaceous, somewhat paler and subindurated toward base, the inner series 1–2 mm. shorter, thinner, paler, obtuse or abruptly short-acute, less pubescent or nearly glabrous; receptacle (in flower) short-conical; rays fertile, the corolla apparently golden yellow, sessile on the achene, oblong, tridenticulate, 11–14-nerved, hispidulous at base, 11–13 mm. long, 3 mm. wide; disk corollas yellow, glabrous, 4.6 mm. long (tube 0.7 mm., throat cylindrical-funnelform, 3.2 mm., teeth ovate, 0.7 mm. long); pales scarious, obtuse or acute, narrowly carinate, 3-nerved, 6 mm. long; ray achenes obovoid-trigonal, glabrous, epappose, 3 mm. long, 1.5 mm. wide, 1–3-nerved on each face, with narrow whitish irregularly undulate margin; disk achenes obovoid, compressed, thickened, about 3-nerved on each side, blackish, glabrous, epappose, truncate at apex, 2.7 mm. long, 1.3 mm. wide.

PERU: Cajamarca, 30 April 1912, *W. H. Osgood & M. P. Anderson* 35 (type no. 346721, Field Museum).

Somewhat similar in appearance to the Mexican *Heliopsis procumbens* Hemsl.

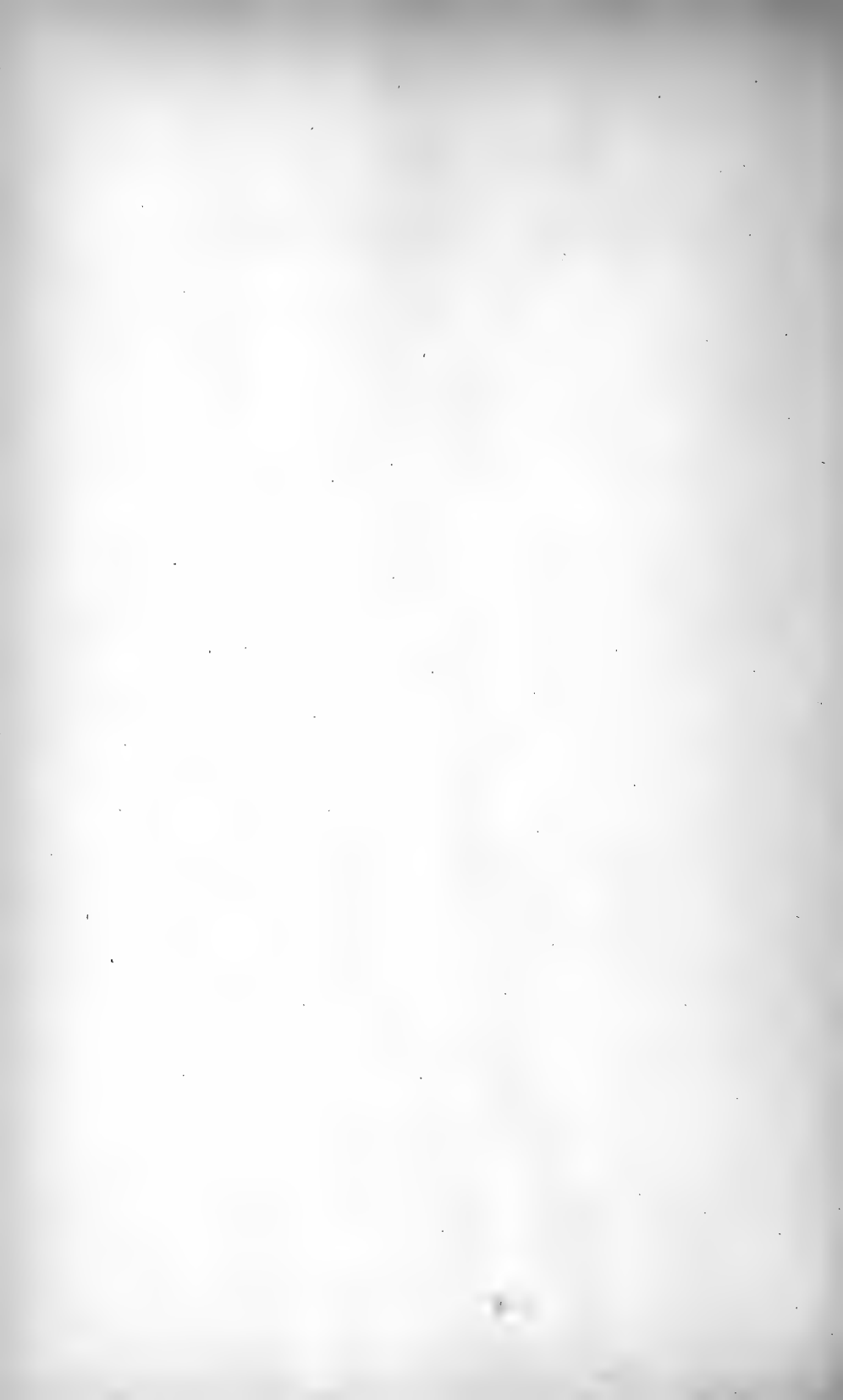
HELIOPSIS BUPHTHALMOIDES (Jacq.) Dunal, Mem. Mus. Paris 5 : 57. 1819.

Anthemis buphthalmoides Jacq. Hort. Schoenbr. 2 : 13. pl. 151. 1797.

Gymnolomia silvatica Klatt, Leopoldina 25 : 104. 1889.

Gymnolomia silvatica Klatt is represented in the Gray Herbarium by a sketch of the type (*Carl Hoffmann* 153, Costa Rica, in silva montis Irazu) in the Berlin Herbarium, accompanied by a pocket containing flowers, pales, and achenes. Examination of this material shows that Klatt's species is identical with the common and widespread tropical American *Heliopsis buphthalmoides* (Jacq.) Dunal. Klatt described the leaves as ovate-lanceolate, 3 inches long, 9 lines wide, but the leaf blades are represented in his careful sketch as ovate, 7–8.5 cm. long, 3–3.8 cm. wide. Klatt's species was referred to *Heliopsis* by Robinson and Greenman¹ in their revision of *Gymnolomia*, but has not previously been synonymized specifically.

¹ Proc. Boston Soc. Nat. Hist. 29 : 104. 1899



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ON SIX NEW LITHOBIID CENTIPEDES FROM NORTH
CAROLINA.

BY RALPH V. CHAMBERLIN,
University of Utah.

The types of the species of Lithobiidae here described as new were in extensive material collected by Mrs. Nelle Bevel Causey, of Duke University, in North Carolina, chiefly in the Duke Forest and other areas adjacent to Durham. The types are retained in the author's collection.

Nampabius mycophor, new species.

General color of dorsum light brown, the head and antennae darker, chestnut, the antennae paler distally; legs yellowish.

Antennae normal. Ocelli 1+3, 3, 4, 2.

Prosternal teeth 2+2, the line of apices recurved; median sinus semi-circular.

Ventral spines of first legs, 0, 0, 0, 0, 0; of the second legs, 0, 0, 0, 0, 1. Ventral spines of penult and anal legs, 0, 1, 1, 1, 0; dorsal, 0, 0, 2, 0, 0. Dorsal spines of tenth and eleventh legs, 0, 0, 0, 2 (1), 1.

Process of penult legs of male longer, with base narrower, than in *tennesseensis*, somewhat fungiform.

Claw of female gonopods tripartite; basal spines 2+2.

Length, 8 mm.

Locality.—North Carolina: Duke Forest. A male and female taken Sept. 15, 1939.

A species related to *N. tennesseensis* but a larger form, the length being 8 mm. as against 6.5 mm. Also differing in the form of the process on the penult legs of male as indicated above.

Paitobius eutypus, new species.

Dorsum a rather dark brown throughout. Antennae rufous distally. Legs brown. Prosternum brown, the venter a lighter brown.

Antennae in type consisting of 32 articles. Ocelli 1+3, 4, 3, 1; the single ocellus contiguous and enlarged as usual.

Prosternal teeth 2+2, with the mesal one on each side larger in typical way and line of apices thereby recurved.

Posterior angles of 9th, 11th and 13th dorsal plates produced.

Ventral spines of first and second legs, 0, 0, 1, 2, 1. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1; claws 2. Ventral spines of anal legs, 0, 1, 3, 1, 0; dorsal, 1, 0, 3, 1, 0; claw single. Last two pairs of coxae laterally armed.

Coxal pores 4, 5, 5, 4.

Anal legs in male inflated, especially the fourth joint, which is longitudinally furrowed above.

Length, 11 mm.

Locality.—North Carolina: Linville. One male taken 14 Oct., 1939.

Differing from *naiwatus* in having the ventral spines of the anal legs 0, 1, 3, 1, 0 instead of 1, 0, 3, 2, 1, and the last two pairs of coxae instead of only the last pair laterally armed. It is also a considerably larger form.

Taiyubius dux, new species.

The general color above is light horn brown.

Antennae of moderate length; composed in the type of 26 articles. Ocelli 1+3, 2, the single ocellus and the posterior ocellus of the upper row enlarged and subequal.

Prosternal teeth small and pale, 2+2, the line of apices a little recurved.

Ventral spines of first and second legs 0, 0, 0, 0, 1. Third joint of only a few of the last pairs of legs with 3 dorsal spines, most of the others with but 1. Ventral spines of penult legs 0, 1, 3, 2 (1), 1; dorsal, 1, 0, 2, 1, 1, the claw double. Ventral spines of anal legs 0, 1, 3, 1, 0; dorsal, 1, 0, 2, 1, 0, the claw double. None of the coxae laterally armed.

Coxal pores small, 2, 3, 3, 2.

Length, 7 mm.

Locality.—North Carolina: Linville. One male, 14 Oct., 1939.

This species is placed in *Taiyubius* on the basis of the recurved line formed by the prosternal teeth. It differs from other known species in its small size and the spining of the legs.

Nadabius saphes, new species.

Dorsum light horn brown, with head, antennae and posterior legs orange.

Antennae short. Ocelli in a narrow patch, 1+4 (3), 3, 2.

Prosternal teeth small, pale, 2+2.

Ventral spines of first legs 0, 0, 0, 2 (1), 1. Ventral spines of penult legs, 0, 1, 3, 2, 1; dorsal, 1, 0, 2, 1, 0; claw single. Ventral spines of anal legs, 0, 1, 3, 2, 0; dorsal, 1, 0, 2, 0, 0; claw single. None of the coxae laterally armed.

The special dorsal lobe of fifth joint of anal legs in male of the typical general form; low and located on mesodorsal side of joint.

Coxal pores small and few, 2, 3, 3, 2.

Length, about 8 mm.

Locality.—North Carolina: Duke Forest. One male taken 18 Oct. 1939.

Nadabius waccamanus, new species.

Color brown, the head and antennae darker, more nearly chestnut; legs lighter brown.

Ocelli 1+3, 3, 2. Articles of antennae moderate in length.

Prosternal teeth 4+4; the line of apices nearly straight; median sinus V-shaped as usual.

Ventral spines of first and second legs 0, 0, 0, 0, 1; of tenth and eleventh legs, 0, 0, 0, 3, 2; of twelfth legs, 0, 0, 2, 3, 2. Ventral spines of thirteenth legs, 0, 0, 2, 3, 2; dorsal, 0, 0, 3, 2, 2. Ventral spines of fourteenth legs, 0, 1, 3, 3, 2; dorsal, 0, 1, 3, 1, 1; claws 2. Ventral spines of anal legs, 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 1, 0; claws 2.

Coxal pores 4 (3), 4, 4, 4 (3).

Claw of female gonopods tripartite, the lateral lobes small; basal spines 2+2.

Length, 10 mm.

Locality.—North Carolina: Lake Waccamaw. One female taken Sept. 24, 1939.

In the absence of the male this form is referred to *Nadabius* with some doubt. It differs from previously known species of *Nadabius*, excepting *saphes*, in having none of the posterior coxae laterally armed and only the last two pairs dorsally armed. It differs from *saphes* in having a double claw on the anal legs.

Lithobius apheles, new species.

Dorsum, antennae and last legs brown, the other legs a lighter brown.

Antennae moderately long; articles 35. Ocelli 1+4, 4, 4, 3.

Prosternal teeth 3+3; median sinus narrowly V-shaped.

Posterior angles of 9th, 11th and 13th dorsal plates produced.

Ventral spines of first legs, 0, 0, 1, 2, 1. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1; claws 3. Ventral spines of anal legs, 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 1, 0; claws 2. Last three pairs of coxae dorsally armed, last two pairs laterally armed.

Coxal pores small, circular, 4, 5, 5, 5.

Posterior legs of male not specially modified.

Length, about 11 mm.

Locality.—North Carolina: Linville. One male taken Oct. 14, 1939.

Differing from other species of the eastern part of the United States in having the anal legs with two claws. The Californian *L. chumasanus* has two claws on the anal legs but is a much larger form.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THREE NEW FORMS OF BIRDS FROM SOUTH
ANNAM.

BY J. H. RILEY.¹

Further study of the fine collection of birds made in the neighborhood of Dalat, South Annam, by Dr. Joseph F. Rock has convinced me that the following three forms require separation, and I am accordingly describing them herewith. I am indebted to the authorities of the American Museum of Natural History through Dr. Ernst Mayr for the loan of a series of *Arachnothera magna aurata*.

***Oriolus chinensis invisus*, subsp. nov.**

Type.—Male, U. S. National Museum, No. 359268, Dran, 3000 feet, South Annam, July, 1939.

Similar to *Oriolus chinensis tenuirostris* from the Yunnan Mountains, but considerably smaller; the inner secondaries with larger yellow tips. Wing, 142; tail, 79; culmen, 30.5.

Remarks.—This form is founded upon four males and three females from South Annam which have been compared with five males and five females from the mountains of Yunnan. The four males from South Annam measure: wing, 142-150 (147.2); tail, 75-80.5 (78.5); culmen, 29.5-30.5 (30). Five males from Yunnan: wing, 151-159 (154.8); tail, 84-89 (85.9); culmen, 31.5-32.5 (32.3).

Evidently this form was thought to be only a winter visitor to South Annam from Burma and Yunnan, but Rock's series proves beyond a doubt that it is a breeding bird and probably resident. A pair from Kloss' collection from the Langbian Region are in the U. S. National Museum. The male collected March 30, and the female May 9; both are in worn breeding plumage as if they had already bred. This would seem to indicate that they breed early.

***Franklinia rufescens dalatensis*, subsp. nov.**

Type.—Male, U. S. National Museum, no. 359217, Fimnon, 3000 feet, South Annam, August, 1935.

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Similar to *Frainlinia rufescens rufescens* of northern and eastern Siam, but pileum darker, the supra-loral streak very faint or absent. Wing, 42.5; tail, 41; culmen, 12.5.

Remarks.—The above race is founded upon three adult males, one adult female, and one immature without sex from South Annam in the neighborhood of Dalat, which has been compared with a good series from northern and eastern Siam. All the specimens examined from Siam in good plumage have a prominent supra-loral white line, in a few cases extending over the eye. In the series from South Annam it is very faint or absent. There does not seem to be any difference in size between the two forms.

***Arachnothera magna remota*, subsp. nov.**

Type.—Male adult, U. S. National Museum, No. 359346, Langbian Peaks, 7020 feet, South Annam, June, 1939.

Similar to *Arachnothera magna magna*, but upperparts a more greenish yellow (near pyrite yellow); the black centers to the feathers of the head and back smaller and less conspicuous; bend of wing and under-tail coverts a deeper yellow; lowerparts averaging more yellowish. Also similar to *Arachnothera magna aurata*, but the lowerparts lighter yellow and the black streaking heavier; bend of wing and under tail-coverts deeper yellow, and the upperparts a more greenish yellow. Wing, 93; tail, 51; culmen, 43.5.

Remarks.—The present form is founded upon eleven specimens from the Langbian Peaks region of South Annam. These have been compared with thirteen specimens from northern Siam, one specimen from Nepal, and one from India of *Arachnothera magna magna*; and seven specimens from Tenasserim and Pegu, Burma, of *Arachnothera magna aurata*. The Langbian form resembles the form from northern Siam more than it does *Arachnothera magna aurata*. There does not appear to be much difference in size between the three forms.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TEN NEW WHITE-TAILED DEER FROM NORTH AND
MIDDLE AMERICA.

BY E. A. GOLDMAN AND REMINGTON KELLOGG.

A revision of the white-tailed deer of North and Middle America is being completed by the writers. Pending the issuance of the more comprehensive account, embracing all of these deer, it seems desirable to publish the following brief descriptions of hitherto unrecognized geographic races of *Odocoileus virginianus* that have come to our attention.

In the course of the work, specimens, the examination of which was almost indispensable, have been borrowed from various institutions and from individuals. For this assistance and other courtesies grateful acknowledgment will more specifically be made later. Special appreciation seems, however, deserving of expression to Ted Dealey, and to his son, Joseph MacDonald Dealey, of Dallas, Texas, for their keen interest and for the generous donation of specimens that have enabled us to segregate and describe a well-marked new geographic race from the high mountains of northern Coahuila.

The names of colors in quotation marks are from Ridgway's Color Standards and Nomenclature, 1912.

Odocoileus virginianus carminis, subsp. nov.

Type locality.—Botellas Cañon, Sierra del Carmen, northern Coahuila, Mexico (altitude 6,500 feet).

Type specimen.—Male adult, skin and skull; no. 265224, U. S. National Museum (Biological Survey collection); collected October 27, 1939, by Joseph MacDonald Dealey, X catalog no. 29148.

General characters.—A medium sized, drab-colored subspecies, without conspicuously blackish upper side of tail; antlers moderately spreading, with short tines. Approaching *Odocoileus virginianus texanus* of Texas in color, but smaller; antlers with shorter tines.

Color.—*Type* (winter pelage): Upper parts in general a mixture of brownish black and “drab-gray,” the banded hairs producing a grizzled effect; top of head and face similar to back, but more finely grizzled, becoming clearer gray on sides of muzzle as far forward as the usual black spots near nostrils; outer and anterior surfaces of limbs to hoofs a mixture of “pinkish buff” and dark brown, the buff predominating; posterior surface of fore limbs to hoofs grayish white; under side of neck and sides of thorax near “drab-gray”; chin, fore part of throat, median abdominal and inguinal areas, and inner surfaces of thighs white; tarsal gland tufts “pale pinkish buff,” ears grayish, mixed with a dark shade of brown, tail above “cinnamon buff” along median portion of basal half, becoming brownish black toward tip, the tip and broad lateral fringes white; under side of tail white.

Skull.—The skull differs markedly from that of *Odocoileus virginianus texanus* in smaller general size, including antlers with distinctly shorter tines. Compared with that of *Odocoileus virginianus couesi* the skull tends to be narrower and more elongated, with more slender rostrum.

Measurements.—(Type and an adult female topotype, respectively): Total length, 1512, 1386 mm.; tail, 214, 182; hind foot, 403, 365. *Skull* (type and an adult female topotype, respectively): Condylbasal length, 242.3, 234; maxillary tooth row, 69.7, 70; width across orbit at fronto-jugal suture, 107.5, 95.

Remarks.—The deer of the Sierra del Carmen, Coahuila, along with those of the Chisos Mountains across the Rio Grande in Texas, here segregated as *Odocoileus virginianus carminis*, differ distinctly from *Odocoileus virginianus texanus* of the adjoining plains region. That complete intergradation of the two must occur along the basal slopes of the mountains seems, however, a safe assumption.

Odocoileus virginianus dacotensis, subsp. nov.

Type locality.—White Earth River, Mountrail County, North Dakota.

Type specimen.—Adult male, skull without antlers, no skin; no. $\frac{2887}{1137}$, U. S. National Museum; collected by F. V. Hayden, surgeon and naturalist with Lieut. G. K. Warren, U. S. A., during the exploration of the Upper Missouri and Yellowstone in 1856.

General characters.—Size very large, equaling or exceeding *Odocoileus virginianus macrourus* of eastern Kansas, *Odocoileus virginianus borealis* of Maine, or *Odocoileus virginianus ochrourus* of Idaho; antlers heavy, moderately spreading, with tines relatively short; color similar to that of *ochrourus*, therefore paler than usual in *macrourus* or *borealis*; dentition heavier than in any other member of the *virginianus* group.

Color.—*Winter pelage:* Adult male (no. 265338, U. S. Nat. Mus., Biol. Surv. Coll.) from Lower Souris Wildlife Refuge, McHenry County, North Dakota: Upper parts in general a mixture of “cinnamon buff” and brownish black, the cinnamon buff predominating and the banded hairs producing a grizzled effect; black element more profuse along a rather narrow median line from back of neck to rump; outer and more exposed surfaces of legs to

base of hoofs light cinnamon buff; under side of neck "pinkish buff"; sides of chest and thorax, as viewed from below, light "cinnamon buff"; lower lips, throat, inguinal and median abdominal areas white, narrowing to a point on middle of chest where the white is narrowly bordered with black; narrowing white lines extending down along the hinder surfaces of the forelegs to knees, and along the inner sides of hind legs to heels; tarsal glands bordered with white; top of head and face finely grizzled grayish buff; orbital areas and muzzle whitish; usual blackish spots present above rhinarium, on sides of nostrils, and sides of chin; ears buffy grayish, edged with black externally, thinly lined with white hairs internally; tail cinnamon, with a few black hairs near tip, broadly fringed with white above, and pure white to tip below.

Skull.—Very similar in general to skulls of *borealis*, *macrourus* and *ochrourus*, but molariform tooth rows longer than in any of the preceding.

Measurements.—Two adult males from the Lower Souris Wildlife Refuge, McHenry County, North Dakota, respectively: Total length, 1803, 1791 mm.; tail, 330, 305; hind foot, 508, 495; weight, 190, 198 lbs. *Skull* (type): Condylbasal length, 290; maxillary tooth row, 88.5; width across orbit at fronto-jugal suture, 123.5.

Remarks.—Subspecies *dacotensis* is similar in general size to the other large northern subspecies. It resembles *ochrourus* of Idaho in color, but exceeds all other forms of the *virginianus* group in the more massive development of the molariform teeth.

***Odocoileus virginianus hiltonensis*, subsp. nov.**

Type locality.—Hilton Head Island, Beaufort County, South Carolina.

Type specimen.—Adult male, skin and skull; no. 256015, U. S. National Museum; collected December 9, 1930, by W. L. Brown.

General characters.—Similar to typical *Odocoileus virginianus virginianus* of Virginia but smaller; tufts on tarsal glands deeply colored, usually near "burnt sienna"; cranial details, especially the narrow, highly arched brain case, distinctive.

Color.—*Type* (winter pelage): Upper parts in general near "cinnamon," purest on sides of neck, body and thighs, the upper surface of neck and back modified by black tips of hairs; facial areas mainly pale drab grayish, becoming whitish around eyes and across muzzle, giving way abruptly to black just behind the nasal pad, and on the outer surfaces between nostrils and lips; top of head a mixture of gray and dull buff; antero-external surfaces of fore limbs rich "cinnamon," becoming duller and somewhat mixed with dusky hairs on lower portions of limbs, the posterior surfaces, white to base of hoofs; exposed surfaces of hind limbs similar to fore limbs, but dusky mixture extending upward to near middle of metatarsus; tufts on tarsal glands deep "burnt sienna"; metatarsal glands bordered by white hairs; white of inner sides of thighs extending downward along anterior surfaces of hind limbs, narrowing gradually to a point just below heels; chin, throat, and under parts white; under surface of neck about like sides of body; a few dusky hairs along median line of brisket; a small black spot

on each side of lower lip; ears dull brownish; upper side of tail cinnamon on basal half, becoming black subterminally, broadly fringed with white, including tip, under side white.

Skull.—Similar in general to that of *Odocoileus virginianus virginianus* but smaller; vault of brain case more highly arched; frontal profile more convex; supraoccipital region narrower, tending to project farther posteriorly on the median line over foramen magnum; nasals less depressed anteriorly, narrower posteriorly, and more encroached upon by lachrymal vacuities; dentition relatively about as in *virginianus*.

Measurements.—*Type*: No external measurements available. *Skull* (type and an adult female topotype, respectively): Condylobasal length, 272.8, 233.7; maxillary tooth row, 77, 69.7; width across orbit at fronto-jugal suture, 113.5, 97.8.

***Odocoileus virginianus miquihuanensis*, subsp. nov.**

Type locality.—Sierra Madre Oriental, near Miquihuana, southwestern Tamaulipas, Mexico (altitude 6,500 feet).

Type specimen.—Adult female, skin and skull; no. 94071, U. S. National Museum (Biological Survey collection); collected June 9, 1898, by E. W. Nelson and E. A. Goldman; original no. 12511.

General characters.—A medium sized, drab-colored subspecies, with conspicuously blackish upper side of tail. Similar in size to *Odocoileus virginianus couesi* of southern Arizona, but ears shorter; color darker, especially over median dorsal area; tail usually with much black above (tail usually without black above in *couesi*).

Color.—*Type* (acquiring summer pelage, the worn winter coat persisting on median dorsal area): Upper parts in general a mixture of "snuff brown" and buff, the banded hairs giving a dark grizzled drab effect; forehead darker, the hairs unbanded and becoming brownish black on crown; outer sides of legs to base of hoofs similar to body in grizzled pattern, but fore limbs darker; under side of neck and sides of thorax near light buff, the hairs with rather indistinct brownish bands; middle of chest dusky; chin, fore part of throat, median abdominal and inguinal areas, inner surfaces of thighs and tarsal gland tufts white; narrow whitish hairs along inner sides of forelegs to hocks and along inner sides of hind legs to near heels; outer surfaces of ears brownish, finely mixed with white, the inner surfaces thinly clothed with whitish hairs; middle of face and cheeks brownish, finely mixed with black; other facial markings as usual in forms of *virginianus*, the orbital areas and sides of muzzle grayish; small areas above rhinarium, sides of nostrils, and on sides of lower jaws blackish; tail above mixed brown and buff, the hairs becoming nearly pure brownish black to roots toward end, and white along margins, below pure white, including extreme tip all around.

Skull.—Very similar to that of *Odocoileus virginianus couesi*. Closely resembling that of *texanus*, but smaller; antlers with shorter tines; maxillary tooth row shorter.

Measurements.—(Type [♀], and an adult male from Sierra Guadalupe, Coahuila, respectively): Total length, 1510, 1530 mm.; tail, 255, 270; hind

foot, 396, 420. *Skull* (type [♀], and an adult male from Sierra Guadalupe, Coahuila, respectively): Condylbasal length, 240.3, 247.5; maxillary tooth row, 71, 71.4; width across orbit at fronto-jugal suture, 101.6, 108.5.

***Odocoileus virginianus nigribarbis*, subsp. nov.**

Type locality.—Blackbeard Island, McIntosh County, Georgia.

Type specimen.—Male adult, skin and skull (antlers shed); no. 265213, U. S. National Museum (Biological Survey collection); collected April 21, 1939, by E. A. Goldman; original no. 24014.

General characters.—Similar to typical *Odocoileus virginianus virginianus* of Virginia, but much smaller; antlers more flattened; pelage shorter; color of upper parts duller "cinnamon" in winter pelage; facial areas and ears blacker, less grayish.

Color.—*Type* (worn winter pelage): Upper parts in general dull "cinnamon," with a dull brownish admixture along upper surface of neck and median dorsal area, becoming paler and passing gradually into "pinkish buff" along sides of body and adjoining under parts; top of head rusty brownish; facial areas and muzzle dark brownish or blackish, with little of the grayish admixture usual in typical *virginianus*; orbital rings dark grayish, but indistinct; exposed surfaces of fore and hind limbs near "pinkish buff," with a brownish admixture on the fore limbs along the median line anteriorly; chin, throat, and under parts white; under side of neck like sides of body; ears brownish black externally, whitish internally; tail above cinnamon along median line, becoming black subterminally, broadly fringed with white to tip, and white below.

Skull.—Similar in general to that of *Odocoileus virginianus virginianus*, but decidedly smaller, with relatively shorter rostrum; antlers more flattened. Similar in size to that of *hiltonensis*, but nasals usually broader, more depressed anteriorly; antlers more rugose at base, and usually more flattened beyond first tines.

Measurements.—(Type and an adult female topotype, respectively): Total length, 1550, 1500 mm.; tail, 272, 230; hind foot, 415, 388. *Skull* (type and an adult female topotype, respectively): Condylbasal length, 249, 238.7; maxillary tooth row, 72, 72; width across orbit at fronto-jugal suture, 106, 100.3.

***Odocoileus virginianus oaxacensis*, subsp. nov.**

Type locality.—Mountains 15 miles west of Oaxaca, Oaxaca, Mexico (altitude 9,500 feet).

Type specimen.—Male adult, skin and skull; no. 68242, U. S. National Museum (Biological Survey collection); collected September 15, 1894, by E. W. Nelson and E. A. Goldman; original no. 6765.

General characters.—A medium sized, "snuff brown" colored subspecies, presenting a grizzled pattern of coloration; tail whitish above; antlers curved forward, rather narrowly spreading.

Color.—*Type*: General coloration of upper parts a mixture of "snuff brown" and buff, the "bister" subapical portion of each hair contrasting

strongly with the light "pinkish buff" tips; dorsal median stripe of snout bister; crown patch and forehead dark bister, the "tulleul buff" tips of the hairs giving a grizzled effect; outer sides of upper hind legs distinctly lighter than rump, grading into whitish drab gray (ticked with the cinnamon drab of the hair shafts) on outer and inner surfaces of hind feet between hock and hoof; lower two-thirds of anterior surface of hind feet distinctly darker than lateral surfaces; fore limbs distinctly darker than hind limbs, the upper fore limbs similar in color to the neck and the fore feet noticeably lighter just below wrist joints; under side of neck "light drab," grizzled with the light tips of the hairs; thorax beneath and laterally "cinnamon"; chin, median abdominal and inguinal areas, inner surfaces of thighs and long tarsal gland tufts white; inner surfaces of forelegs from axilla to near hoofs, and of hind legs from groin to hock covered with long whitish hairs; outer surfaces of ears near dull sepia, lightened by the short light tips of the hairs; inner surfaces of ears thinly covered with white hairs; face and cheeks light drab, distinctly grizzled with the light tips of the hairs; between the narrow bister band opposite the nostril, extending from upper lip to dorsal median stripe of snout and rhinarium, is a small white patch and behind this band is a conspicuous patch of whitish tipped hairs; tail whitish above, the long white tips concealing the "seal brown" basal portions of the individual hairs except near the median line; under side of tail white; orifice of each interdigital gland marked by small patch of white hairs between and above hoofs.

Skull.—Very similar to that of *Odocoileus virginianus thomasi* of the lowlands near the Isthmus of Tehuantepec, but dorsal profile more elevated above lachrymal fossa, nasals shorter, and brain case shallower; antlers curved forward, instead of inclined backward as in *thomasi*. Skull smaller than that of *mexicanus* and antlers somewhat smaller.

Measurements.—*Type*: Total length, 1340 mm.; tail, 170, hind foot, 362; height at shoulder, 750. *Skull* (type): Maxillary tooth row, 68; width across orbit at fronto-jugal suture, 102.8.

***Odocoileus virginianus seminolus*, subsp. nov.**

Type locality.—Ten miles northeast of Everglades, Collier County, Florida.

Type specimen.—Male adult, skin and skull (antlers in velvet); no. 265557, U. S. National Museum (Biological Survey collection); collected April 13, 1940, by R. H. Tabb, X catalog no. 29415.

General characters.—A medium-sized or rather large subspecies; pelage very short; upper parts in summer pelage a dark rufescent shade near "hazel"; ears and hind feet rather short; antlers narrowly spreading; rostrum slender.

Color.—*Type* (acquiring summer pelage): Upper parts near "hazel" in general tone, the individual hairs along the median line of the back with very short, blackish tips and subapical cinnamon bands, below which there is a narrow dusky band, giving way to the deeper reddish sub-basal color and producing an indistinctly grizzled effect; crown patch on head "hazel," with a blackish admixture along middle of forehead; upper surface of snout

and sides of muzzle near nose pad blackish; orbital areas grayish; cheeks "cinnamon-buff"; ears scantily covered externally with a mixture of buffy and brownish hairs; sides of body, thighs, and exposed surfaces of upper fore limbs "cinnamon," paling gradually towards hoofs to "cinnamon-buff;" feet below "dew claws" buffy whitish; white of under parts distributed as usual in the species; no black on brisket; tail above a mixture of "hazel" and black along median line, the black predominating toward tip, which is white; lateral margins and under side of tail pure white, as in other subspecies.

Skull.—Similar to that of *Odocoileus virginianus virginianus* in length, but narrower, the narrowness usually most noticeable in the rostrum and in the zygomatic width; nasals more depressed and flattened anteriorly; antlers less widely spreading; maxillary tooth row longer in proportion to condylobasal length.

Measurements.—(Type, and an adult female from 21 miles southwest of Immokalee, Collier County, respectively): Total length, 1906, 1473 mm.; tail, 292, 254; hind foot, 375, 368. *Skull* (Type, and adult female listed above, respectively): Condylobasal length, 282, 259; maxillary tooth row, 79.7, 77; width across orbit at fronto-jugal suture, 108.5, 102.

***Odocoileus virginianus taurinsulae*, subsp. nov.**

Type locality.—Bulls Island, Charleston County, South Carolina.

Type specimen.—Male adult, skin and skull; no. 265356, U. S. National Museum (Biological Survey collection); collected December 18, 1939, by W. P. Baldwin; X catalog number 29214.

General characters.—Similar to typical *Odocoileus virginianus virginianus* of Virginia, but smaller; general color somewhat darker, the upper parts suffused with a darker cinnamon or cinnamon buffy tone; facial areas distinctly darker—dark brownish or blackish along median line; skull differing in detail.

Color.—*Type* (winter pelage): Upper parts in general near "sayal brown," moderately mixed with black along the median line of neck and over back, producing a "ticked" effect; sides of neck near "avellaneous" or "wood brown"; forehead between eyes mixed buffy gray and brown; median upper surface of muzzle from nasal pad to near eyes blackish; sides of muzzle and orbital rings grayish; a blackish spot near outer edge of nostril on each side; cheeks "avellaneous"; exposed surfaces of fore and hind limbs near "sayal brown" with a dusky admixture limited mainly to the median lines extending upward from the hoofs about six inches anteriorly; tufts on tarsal glands "mikado brown"; chin, throat, and under parts white; under surface of neck, sides of chest and thorax "avellaneous"; a narrow area along median line of brisket blackish; outer surfaces of ears brownish, mixed with grayish buff toward base; tail above overlaid with cinnamon at extreme base, becoming black along median line, with a broad white border and white-pointed tip, white below.

Skull.—Similar to that of typical *Odocoileus virginianus virginianus*, but smaller; rostrum relatively shorter; nasals relatively broader, dentition about the same.

Measurements.—(Type and an adult female topotype, respectively): Total length, 1575, 1499 mm.; tail, 225, 216; hind foot, 393, 413; weight, 128.5, 89 lbs. Skull (type and an adult female topotype): Condylbasal length, 269, 239; maxillary tooth row, 70, 71.2; width across orbit at fronto-jugal suture, 118, 99.

***Odocoileus virginianus venatorius*, subsp. nov.**

Type locality.—Hunting Island, Beaufort County, South Carolina.

Type specimen.—Young adult male, skin and skull; no. 256049, U. S. National Museum; collected December 12, 1930, by W. L. Brown.

General characters.—Similar to typical *Odocoileus virginianus virginianus* of Virginia, but smaller; upper parts paler buff, less inclining toward "cinnamon buff" or "cinnamon" than usual in *virginianus* in winter pelage; skull differs mainly in size, but presents a more uniform pattern in structural details.

Color.—*Type* (winter pelage): Upper parts in general a coarsely grizzled mixture of "pinkish buff" and brownish black, the individual hairs along upper side of neck and over dorsum with a black tip and a buffy subterminal band below which there is a brownish black zone paling gradually to near "smoke gray" toward base; sides of neck, shoulders, sides of body and thighs purer pinkish buff due to a thinning out of the dusky element; top of head buffy gray, becoming clearer gray on middle of face, and whitish around eyes and across muzzle; white of muzzle extending to upper edge of rhinarium (without the black spot present in some other specimens); a black spot on each side between nostril and lip; under side of neck, chest, and sides of abdomen pinkish buff; white of throat continuous with white of chin, but usual black spot present on each side of lower lip; median abdominal and inguinal areas white, the white extending in narrowing lines along inner sides of hind legs to a point below heels; white on inner sides of forelegs extending to below knees; exposed surfaces of fore and hind legs "cinnamon" down to near upper edges of hoofs where this color gives way to pale buff with a dusky admixture; tufts on tarsal glands buffy white; metatarsal glands bordered by white tufts, intermixed with a few dusky hairs along outer edges; ears grayish buff externally, lined with white internally; tail above "cinnamon buff" along the median section to a black subterminal patch, broadly fringed with white, below entirely white, as usual in the species.

Skull.—Closely resembling that of typical *Odocoileus virginianus virginianus*, but decidedly smaller, with relatively shorter rostrum; nasals more uniformly flattened and depressed anteriorly; dentition about the same as in *virginianus*.

Measurements.—No external measurements available. *Skull* (type and an adult female topotype): Condylbasal length, 250.7, 237.5 mm.; maxillary tooth row, 78.3, 74.5; width across orbit at fronto-jugal suture, 105, 102.

Odocoileus virginianus veraecrucis, subsp. nov.

Type locality.—Chijol, northern Vera Cruz, Mexico (altitude 200 feet).

Type specimen.—Adult female, skin and skull; no. 93192, U. S. National Museum (Biological Survey collection); collected May 10, 1898, by E. W. Nelson and E. A. Goldman; original no. 12363.

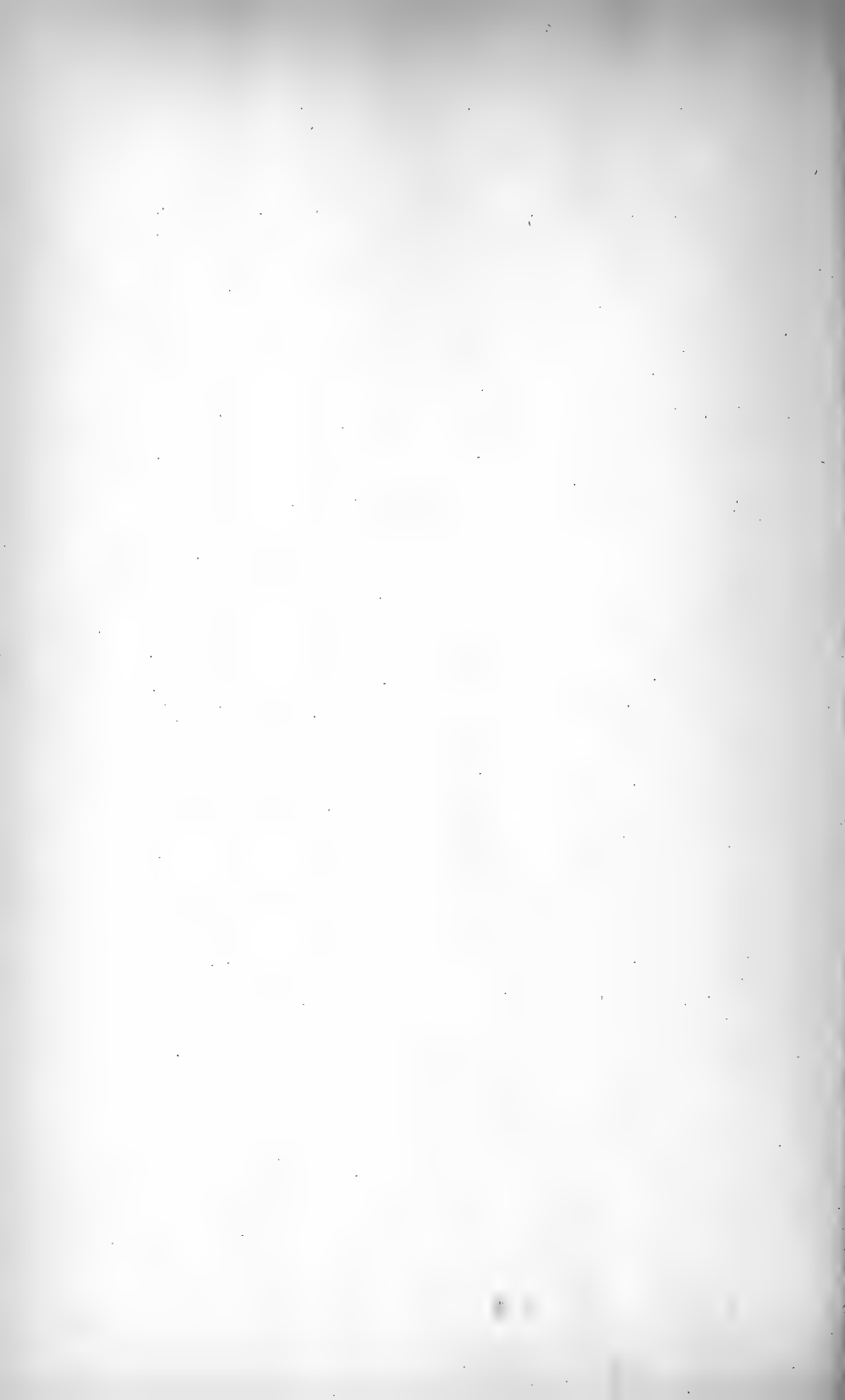
General characters.—A medium sized "pinkish-buff" or "cinnamon-buff" to "ochraceous tawny" subspecies, with tail usually more or less distinctly blackish on upper side subterminally. Differing from neighboring geographic races in combination of color and cranial details.

Color.—*Type*: Upper parts nearly uniform light "ochraceous-tawny," this color becoming darker and richer along median line of back and paler on sides of neck and along sides of body; thinly mixed with black along median line of neck; top of head "ochraceous-tawny" mixed with black; anterior and outer surfaces of forelegs "cinnamon buff," a narrowing whitish line extending down posterior surfaces to near hoofs; exposed surfaces of hind legs pinkish buff; chin, throat, median abdominal and inguinal areas, and inner sides of hind legs down to near heels white; under side of neck chest and sides of thorax pinkish buff; tufts on tarsal and metatarsal glands dull whitish; lower lip with a blackish spot on each side; sides of muzzle and cheeks buffy grayish; upper surface of muzzle and middle of face to forehead scantily covered with very short, dark brownish hairs, intermixed with a few scattered white hairs; orbital areas buffy whitish; ears very short-haired, "pinkish buff" near upper base, becoming dark brownish toward tips, the whitish spot on anterior margin near notch distinct; tail above "cinnamon" medially at base, becoming "cinnamon buff" inconspicuously mixed with brownish toward tip, the margins and under side to tip being white as usual in the species.

Skull.—Somewhat smaller than in *Odocoileus virginianus texanus*, with shorter maxillary tooth row. The skull is somewhat larger than those of *Odocoileus virginianus toltecus* and *Odocoileus virginianus thomasi*.

Measurements.—(*Type* [♀] and a young adult male topotype, respectively): Total length, 1500, 1430 mm.; tail, 225, 250; hind foot, 375, 390; height at shoulder, 760, 800. *Skull* (type): Condylbasal length, 237.8; maxillary tooth row, 75; width across orbit at fronto-jugal suture, 95.5.

Remarks.—The northern Vera Cruz white-tailed deer is distinguished by light buffy general coloration, in contrast to the darker and duller tones of the geographic neighbors to the north and west. It also exhibits a departure from the richer tawny coloration of *Odocoileus virginianus thomasi*, with which it intergrades on the south.



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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES

SKULL OF FOSSIL PORPOISE, *Delphinodon dividum*, FROM BANKS OF POTOMAC RIVER, AT WAKEFIELD, VIRGINIA.

On August 17, 1939, while in the company of Mr. John H. Dante, Mr. Robert Fuerst discovered a porpoise skull protruding from the Miocene sediments of the west bank of the Potomac River a little south of Colonial Beach, Virginia. The skull, which was badly damaged on removal, was brought to the Department of Geology and Geography at The Catholic University of America where it was restored and identified by the writer. It proved to be the remains of a fossil porpoise, *Delphinodon dividum*, common in the Calvert Miocene of the Chesapeake Region.

The remains were exposed on the face of a ten foot cliff, about a foot above the bottom of the river. The men who removed the skull informed me that, under the best conditions, only about two inches of the posterior portion of the skull was above water. To complicate matters toward the end of the work of removal, the water had risen about a foot. In addition to this, the exposure was about fifty feet from the nearest sandy beach in a rather inaccessible location approximately a mile north of Wakefield Mansion. Under these adverse conditions it was not possible to remove the skull with the care that ordinarily could be exercised.

The matrix in which the skull was embedded contained much fossil bone and consisted of a fine marine sand with very little admixed mud. The position of the skull with respect to the strata indicated that it had come to rest at the time of burial with the rostrum inclined downwards at a considerable angle. From this it would appear that, after dismemberment from the rest of the body, it had been lodged in a pocket not far beyond the shore limits.

The writer, in the summer of 1938, found a considerable quantity of dismembered cetacean remains in this area together with remnants of a partially ossified vertebra of the Miocene shark, *Carcharodon megalodon*? which, so far as he is informed, has only been reported otherwise from Zone 12 of the Chesapeake Miocene series. The similarity of the vertebrate fauna from these two areas would make it appear that the strata in question were approximately of uppermost Calvert age.

The skull, as restored, is 150 mm. wide at the orbits; 190 mm. wide at the zygomatic processes of the squamosals; and has an overall height of 100

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mm. The occipital and orbital areas of the skull are reasonably well preserved, but the last quarter of the rostrum is lacking. The dimensions and general appearance of the skull here described resemble so closely those of *Delphinodon dividum* at the National Museum¹ and another specimen of this species procured by the writer² from Zone 12 of the Miocene series of the Calvert Cliffs, near Parker Creek, Maryland, that there can be little doubt as to the identification.

ARTHUR R. BARWICK,
Department of Geology & Geography,
The Catholic University of America, Washington, D. C.

THE CORRECT NAME OF THE FLORIDA HYDATINA.

This beautiful mollusk has for a long time been sailing under a relative's name, namely *Hydatina physis*. This is probably largely due to the fact that the animals of members of this genus rarely come into the hands of the taxonomist who deals chiefly with their shells.

We have recently had a beautiful series of specimens of the Florida Hydatina brought to our Institution by Mr. John H. Irons, gathered at Lake Worth, Florida, which show at a glance that the animal has an entirely different color scheme from that pictured for *H. physis*. Our mollusk, instead of being variously ornately attired, has a unicolor brown tint which varies from a burned umber edge at the edge of the mantle to light brownish drab on the major portion of the upper surface. The tip of the tentacles agrees with the edging of the mantle, while the base agrees with the major portion of the body. The foot is light brownish drab. The shell itself is marked by pale and light spiral zones, usually brown ones alternating with bluish black. A search of the literature reveals that in 1786 Solander (Humphrey) used the name *Bulla vesicaria* in the catalogue of the Portland Museum, page 136, for the West Indian shell, basing this upon Albertus Seba's "Locupletissimi rerum naturalium thesauri," vol. 3, pl. 38, figs. 46-48; *vesicaria* therefore becomes the specific name for the large beautiful Florida Hydatina.

We are greatly indebted to Mr. Irons for bringing to our attention the decidedly distinctive characters of the Florida species as compared with those from the Orient. A large series of beautifully preserved specimens show plainly from the color scheme alone that our Florida species has nothing in common with that of the Pacific.

Mr. Irons furnished me with the following interesting notes on the habits of this animal.

"Hydatina evidently spends most of its life burrowing in the silt and sand of sheltered waters. It emerges at breeding time when the egg cases are delivered and attached to small marine growths where fertilization evidently takes place."

PAUL BARTSCH,
United States National Museum.

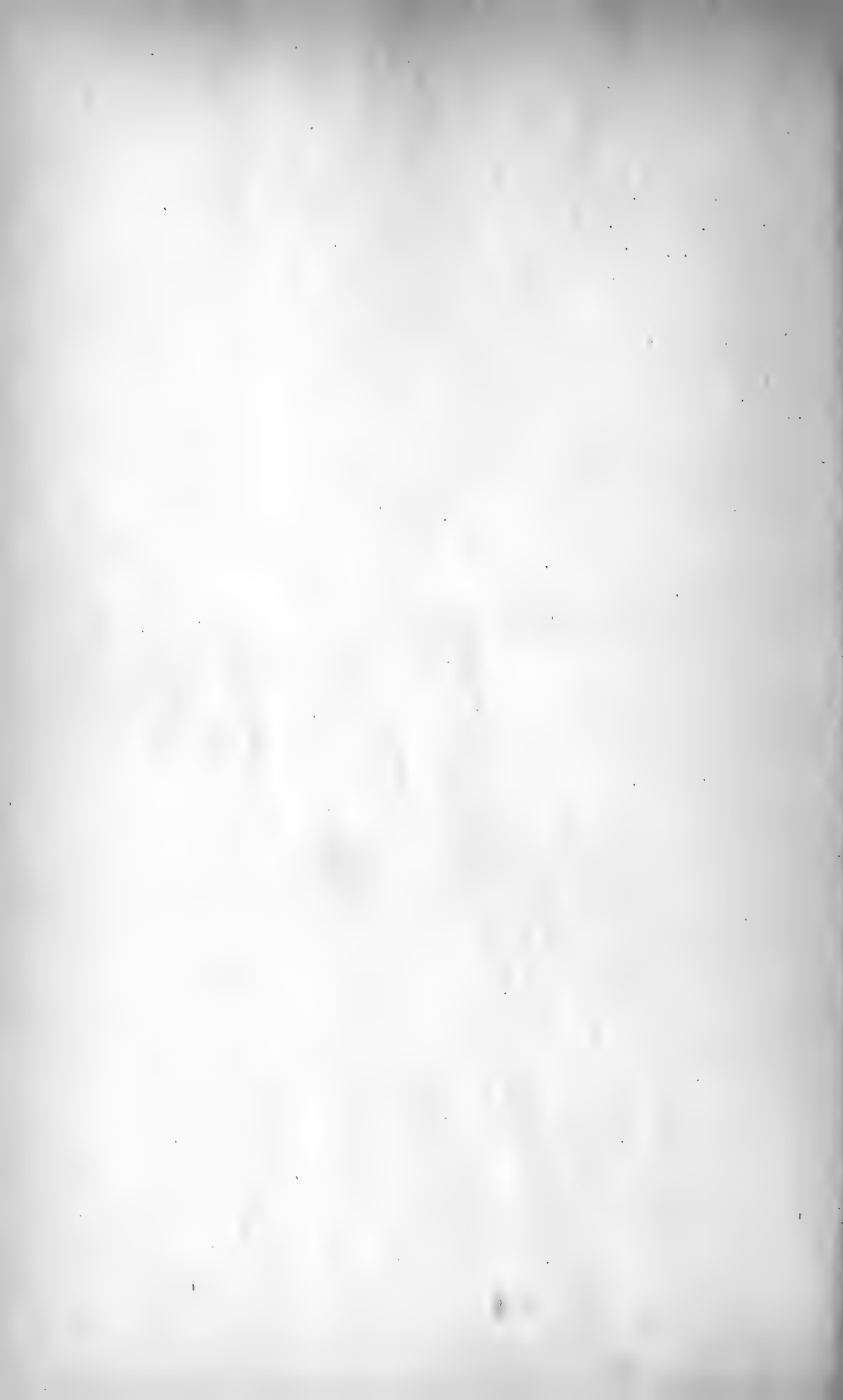
¹ True, F. W., 1912: *Jo. Acad. Nat. Sci., Phila. (n. s.)* 15; pp. 163-194.

² Barwick, A. R., 1939, *Amer. Midland Nat., Vol. 22, No. 1*; pp. 154-159.

A SUBSTITUTE NAME FOR THOMOMYS BOTTAE OCCIPITALIS
BENSON AND TILLOTSON.

Professor Lee R. Dice has called our attention to the fact that he used the combination *Thomomys bottae occipitalis* (Carnegie Inst. Washington, Publ. 349, p. 125, 1925) in naming a fossil gopher from the Rancho La Brea deposits, California. This preoccupies usage of our name (Proc. Biol. Soc. Washington, vol. 52, p. 151, October 11, 1939) for a gopher from La Misión, 2 miles west of Magdalena, Sonora, Mexico. For the latter name we substitute *Thomomys bottae basilicae*.

SETH B. BENSON AND DANIEL F. TILLOTSON,
Museum of Vertebrate Zoology, Berkeley, California.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SYRRHOPHUS FROM GUERRERO, MEXICO.

BY EDWARD H. TAYLOR.

Among the amphibians which I obtained in Guerrero, and now a part of the E. H. Taylor-Hobart M. Smith collection, are numerous specimens of a small eleutherodactylid frog which appears to be an undescribed form. I describe it herewith as—

Syrrhophus pipilans, sp. nov.

Plate I.

Type.—EHT-HMS No. 6843; collected 9 mi. south of Mazatlán, Guerrero, México (km. 337) July 22, 1936, by Edward H. Taylor.

Paratypes.—EHT-HMS Nos. 6841, 6842, 6844-6855, 9 mi. south of Mazatlán, Guerrero, July 22, 1936. Nos. 6856-6860, 6871-6872, Agua del Obispo near Rincón, Guerrero, July 24 and Aug. 1, 1936. No. 6861-6865 near Xaltinanguis, Guerrero, July 27, 1936. Nos. 6867-6869, 4 mi. north of Acapulco, July 29, 1936. No. 6870 near Agua del Obispo (km. 357) Aug. 1, 1936; all collected by E. H. Taylor.

Diagnosis.—A small frog of medium size in the genus (known maximum size 31 mm.); tibiotarsal articulation reaches posterior corner of eye; free part of fourth toe, 2.5 times free part of fifth; a flat inguinal gland reaching groin; paratoid gland above insertion of arm well developed; lower edge of tympanum distinctly elevated; vertical diameter of tympanum very slightly more than half of the length of eye; practically no sexual dimorphism in size of the tympanum; a large median palmar tubercle, no outer tubercle; no vomerine teeth; tongue shaped like a grain of maize, notched behind; terminal disks more or less widened.

Description of the type.—Adult female. Snout seen from above perfectly oval; nostrils lateral without any significant elevation; canthus rounded, although the dark loreal region and the lighter dorsal region suggest, to the eye a sharp canthus; there is a very slight "constriction" back of the nostrils breaking the continuity of the canthal line; the canthal lines, if extended, would intersect at tip of snout.

Eye large (4.8 mm.), equal to its distance from the anterior edge of nostril; the length of the snout, 4.5 mm.; width of an eyelid (2.5 mm.)

less than the interorbital distance (2.9 mm.); tympanum vertically oval, the lower rim distinctly elevated, the upper posterior part of rim concealed by skin which does not form a fold or at most only a very inconspicuous one.

No vomerine teeth; choanae moderate in size, almost lateral, but not concealed by jaw when seen from below; openings of the mucous glands lie posterior to the anterior level of choanae; tongue elongate, pyriform, or the shape of a grain of maize, slightly notched behind, the posterior third (or a little less) free. (Males with well-developed vocal sacs, the openings elongate, forming a distinct fold or disk on the throat.)

Arm long; brought forward, nearly one-half of forearm extends beyond snout; second finger equal or minutely longer than first finger; terminal disks of first two fingers a little wider than digits; those of the third and fourth fingers nearly double the narrowest width of these digits, without or with only a faint trace of a terminal transverse groove; subarticular tubercles very large, subconical; inner palmar tubercle at base of first finger smaller than the subarticular tubercle of this finger; a large rounded median palmar tubercle, nearly double size of the inner; no outer tubercle; five supernumerary palmar tubercles on palm and base of digits, with numerous very small tubercular granules between them and between bases of digits; a very slight dermal ridge on lateral edges of digits; a small tubercle posterior to the median palmar tubercle.

Leg rather short proportionally, the terminal disks of digits usually about a fourth wider than digit, smaller than those on outer fingers, with or without a trace of a transverse groove; free part of fourth finger 2.5 times free part of fifth; subarticular tubercles large, salient, conical; supernumerary tubercles on digits low, indistinct save at the bases of digits; inner metatarsal tubercle as large as the subarticular tubercle of first toe; outer metatarsal tubercle about half as large; sole of foot covered with very numerous smaller granular tubercles; when limbs are folded at right angles to body, the heels barely touch.

Skin above very smooth, with faint indications of smooth pustules on back and sides; skin of ventral surface of body absolutely smooth, lacking all trace of granulation; a ventral disk present on abdomen (barely distinguishable in the female type, distended with eggs, but prominent in a younger female and all the males); posterior edge of disk crosses abdomen some distance from femurs; ventral surface of femur with granulations; posterior surface of femur granular up to anus; a slight transverse fold or longitudinal swelling on femurs somewhat below anus; anal flap obsolete, the region posterior to anus fluted, the median groove not strongly developed; inguinal gland flat, indistinct, its extent can be determined by the small surface pores, or by dissection. Paratoid gland moderately distinct, its extent evident externally.

Measurements in millimeters.—Snout to vent, 31; length of head, 11.3; width of head, 10.4; arm, 20.7; leg, 41.6; tibia, 13.5; foot, 18.

Color in life.—The lighter parts of the dorsal markings are amber to yellow-brown; the darker mottled areas are lavender to lavender-brown; arms and legs more or less irregularly banded with lavender; side of head



Plate I. SYRRHOPHUS PIPILANS, SP. NOV. TYPE.



and snout with a dark lavender band; upper lip with an irregular row of small creamy-white dots which may extend to arm; sides with some indefinite lighter flecks or spots; dull whitish on ventral surfaces lacking any trace of yellow or orange coloration. Chin, under sides of arms, femurs, tibia and feet with a thin peppering of lavender pigment scarcely discernible without a lens. This pigmentation is lacking on median part of breast and abdomen.

Variation.—The large series is very uniform in size and proportions. In some of the specimens the mottling on the back is more distinct, in which case the lighter amber color may be somewhat silvery and the dark spots or flecks purplish or purplish brown. In others the mottling is so obscure as to make the back appear almost unicolor. In some specimens the inguinal gland appears somewhat yellowish beneath the skin. The exudate is usually whitish.

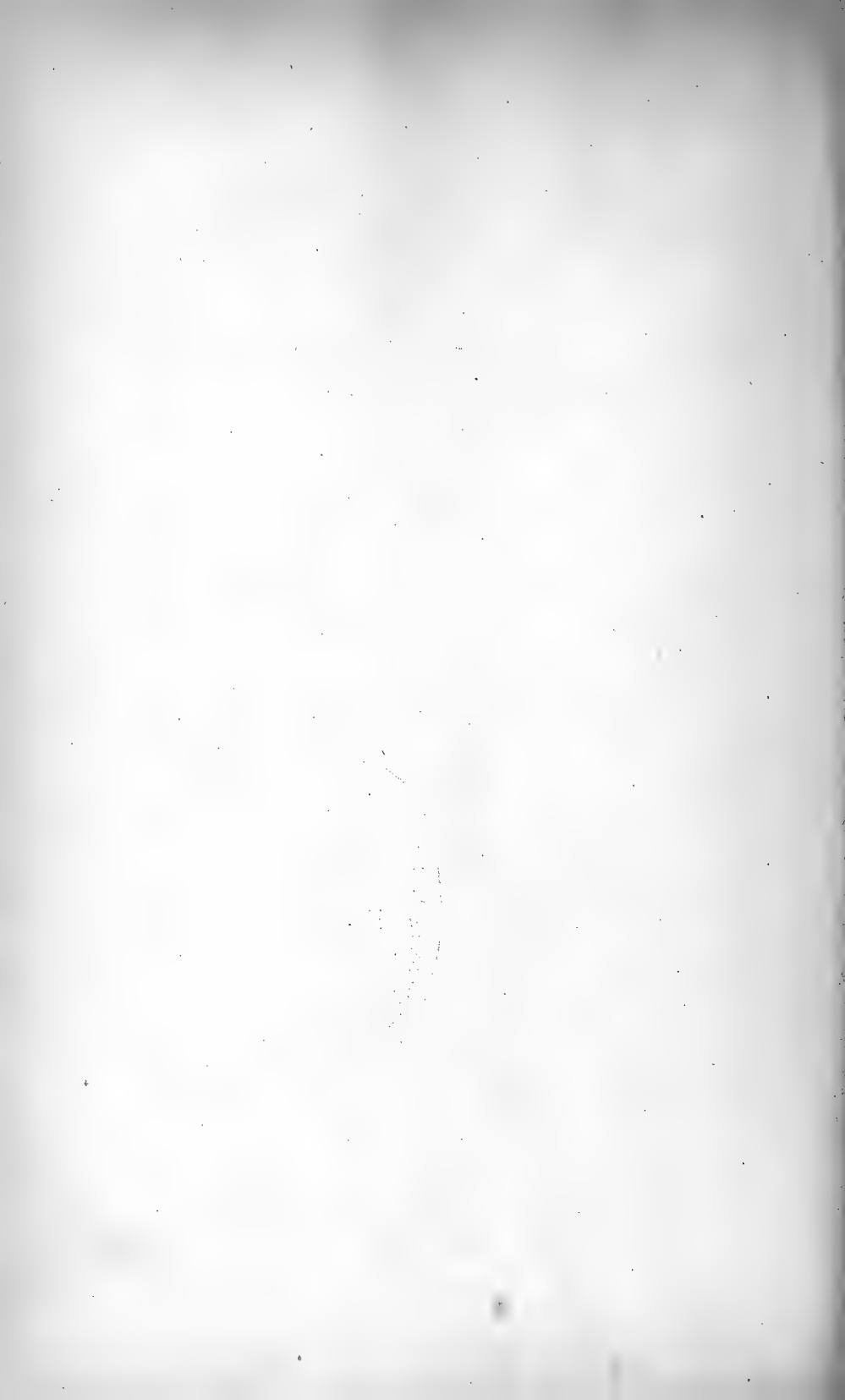
Remarks.—Specimens were obtained on rainy nights by following the calls of the males. These were found with no inconsiderable difficulty, usually perched on boulders and limestone masses, or ensconced in holes and crevices. One was taken in a small tree; and two females were found during the daytime under rocks.

The call is a whistled chirp. It is usually given but once, and repeated only after a considerable period (often one to five minutes). The name *pipilans* refers to this chirping habit.

I presume that the species is one of the distinctive forms of the Sierra Madre del Sur since it has not been found elsewhere. The flat inguinal gland is present in many of the species of *Syrrhophus*, but the large paratoid gland is usually absent. In general appearance the species seems to resemble *Syrrhophus leprus* but may be readily separated from that form by the presence of the paratoid gland, which I do not find in *S. leprus*.

EXPLANATION OF THE PLATE.

Syrrhophus pipilans, sp. nov. Type. Upper figure X 2; three lower figures X 2.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

SYNOPSIS OF THE CADAVERINUS GROUP OF THE
GENUS *APHODIUS* WITH DESCRIPTIONS OF
THREE NEW SPECIES (COLEOPTERA:
SCARABAEIDAE).

BY LAWRENCE W. SAYLOR,
U. S. Department of the Interior, Bureau of Biological Survey.

The dung beetles comprising the so-called Cadaverinus Group of the genus *Aphodius* are very rare in collections, owing in part to the fact that the species are extremely local in distribution.

All but one of the species listed herein have been examined for wing length. The exception is *A. nevadensis* Horn, specimens of which were not available; but the wings of this species are said, however, to be greatly reduced. *A. oblongus* Say, *A. gravis* Fall, and *A. sparsus* Leconte are all fully winged; these species also have a rather long metasternum, and in these two characters are quite distinct from the other species now included in the group. Every other species treated in this paper has the wings vestigial (one-half to two-fifths of the length of the abdomen, and not as wide as the width of the hind tibiae) and the metasternum rather short (measured along the midline of the insect). This latter character has not been mentioned by other students of the group but appears to be of value since it definitely separates the fully winged from the vestigial-winged species. This is probably a direct correlation since many insects having vestigial wings possess reduced metasterna whereas their nearest-winged relatives may have well developed metasterna.

Several species here dealt with have been described rather recently as new, but no key to the group has yet been presented. The key has been purposely made fuller than usual, since some of the species are rather closely related and I wish to leave no doubt in the mind of the person using the key as to the identity of the specimens.

SYNOPTIC KEY TO THE SPECIES.

1. Base of thorax with a distinct and entire marginal line.....2
Base of thorax without a marginal line, or if one is present
at middle, it is entirely lacking near the hind angles.....11

2. (1) Apex of clypeus with distinct teeth.....3
 Apex of clypeus rounded or angulate, never with definite teeth.....4
3. (2) Punctures of elytral striae separated by about twice their diameters, intervals flat, sparsely and finely punctured; first segment of hind tarsus a little shorter than the following four segments combined. Average length 7 mm.
 Eastern.....*oblongus* Say
 Punctures of the striae usually separated by less than twice their diameters and coarser, the intervals flat, the puncturation fine but moderately dense; first segments of hind tarsus subequal to the following four in length.
 Western. Average length 9 mm.....*gravis* Fall
4. (2) Clypeus punctate but smooth, never granulate, at the most faintly rugose.....5
 Clypeus punctate and distinctly granulate or rugose.....9
5. (4) Base of thorax distinctly sinuate, sides not evenly arcuate; disc with very dense and extremely fine punctures, and, intermixed sparse, scattered, somewhat larger punctures, but none of the punctures coarse; elytra oblong, the humeri very indistinctly dentate; elytral striae finely and not closely punctate, the intervals flat and with very fine and hardly perceptible punctures; first segment of hind tarsis distinctly longer than the following three. Known to occur only in nest of the woodrat, *Neotoma*, in California and Oregon.....*sparsus* Leconte
 Base of thorax evenly rounded, not at all sinuate; other characters not as in *sparsus*.....6
6. (5) Apical third of lateral thoracic margin either distinctly or noticeably explanate; lateral margins sinuate or emarginate near basal angles; elytral humeri distinctly dentate; first segment of hind tarsus distinctly longer than the following three. Central and Southern California.....8
 Thorax not explanate anteriorly; lateral margins usually straight or nearly so; elytral humeri usually rounded, rarely faintly dentate; first segment of hind tarsus equal to or shorter than the following three. Northern California, Oregon and Washington.....7
7. (6) Thorax much narrower behind and neither sinuate nor emarginate near hind angles; disc with extremely minute punctures and also much larger but only moderately coarse and variolate punctures, the latter rather scattered; clypeus widely and shallowly emarginate, the angles rounded, the disc at most faintly rugose; elytra oblong, striae deep, with coarse punctures separated by two to three times their diameters, the intervals

faintly convex and with hardly discernible punctures; humeri not dentate. Length 6 mm. Known from Oregon, Washington and California.....*cibratulus* Schmidt

Thorax but very little narrower behind, faintly sinuate near the hind angles; disc of thorax distinctly alutaceous and with only large and scattered punctures, finer intermixed punctures apparently lacking; punctures of the elytral striae very fine, humeri broadly rounded. Length 10 mm. Washington

8. (6) Lateral thoracic margin very distinctly explanate in anterior half, in basal half very slightly bisinuate, with hardly noticeable but extremely fine punctures and moderately dense, somewhat coarse punctures intermixed; clypeus widely and very shallowly emarginate at apex, the angles broadly rounded; elytra ovate, striae fine and with fine punctures, the intervals flat, wide and with sparse and minute punctures; known only from Fort Tejon and the San Diego region of California.....*pullmani*, new sp.

Lateral thoracic margin but slightly explanate anteriorly, with but one emargination and that a distinct one just before the hind angles; disc with very minute punctures and also some extremely coarse and variolate, rather sparsely scattered punctures; clypeus widely and shallowly emarginate, the angles faintly indicated; elytra semiovalate, striae fine and punctures somewhat coarser than in *ovipennis*, intervals flat and very minutely punctate. Known only from a limited area around the San Francisco Bay region of California (Lake and Alameda Counties).....*ovipennis* Leconte

Lateral thoracic margin but slightly explanate anteriorly, with but one emargination and that a distinct one just before the hind angles; disc with very minute punctures and also some extremely coarse and variolate, rather sparsely scattered punctures; clypeus widely and shallowly emarginate, the angles faintly indicated; elytra semiovalate, striae fine and punctures somewhat coarser than in *ovipennis*, intervals flat and very minutely punctate. Known only from a limited area around the San Francisco Bay region of California (Lake and Alameda Counties).....*cadaverinus* Mannerheim

9. (4) Elytral humeri distinctly dentate; clypeal angles slightly angulate. Clypeus very rugose and granulate, apex very shallowly and not widely emarginate; thorax evenly arcuate laterally and a little narrowed behind; disc with both very minute punctures and moderately coarse and rather sparsely scattered punctures; elytra with striae fine, the punctures coarse, intervals slightly convex and with minute punctures. Central California (San Francisco to Placer County).....*gentilis* Horn

Elytral humeri not dentate; clypeal angles broadly rounded. Oregon and Washington.....10

10. (9) Thorax hardly narrowed behind; body robust and not at all constricted between elytra and thorax, elytra rounded apically. Clypeus slightly rugose, emargination very broad and shallow, angles very much rounded; thorax nearly quadrate in shape, disc with minute punctures sparsely scattered and coarse, variolate punctures intermixed, the latter closer together at sides; elytral striae

- fine, sparsely punctate, intervals flat and with minute punctures. Length 7-8 mm. Oregon.....*dilaticollis* Saylor
- Thorax gradually and noticeably narrowed behind, body more elongate and elytra much more pointed apically; body distinctly constricted between base of elytra and thorax. Clypeus coarsely rugose, very broadly and not deeply emarginate, the angles rounded; thoracic disc with minute punctures and coarse, variolate, irregularly scattered, moderately dense punctures; elytral striae fine, with fine punctures, intervals flat, broad and with minute punctures; apical tooth of front tibia abruptly truncate (? sexual). Length 10.5 mm. Oregon.....
caseyi, new species
11. (1) Apex of clypeus with two teeth or none; thorax narrowed at base or not.....12
- Apex of clypeus with four teeth, the thorax very greatly narrowed basally. Clypeus with the central two teeth widely separated by a shallow emargination, the lateral teeth much smaller and also separated by an emargination from each of the larger teeth, clypeus very coarsely granulate. Thorax with the sides evenly arcuately rounded, the disc very densely and entirely punctured with fine and coarse punctures intermixed; elytral humeri not dentate, striae very fine and with fine punctures, intervals flat with dense and fine but quite obvious punctures. Known from Nevada and California.....
pyriformis Brown
12. (11) Clypeal apex with two teeth.....13
- Clypeal apex rounded, at most faintly angulate.....14
13. (12) Thorax subquadrate, sides slightly arcuate and narrowed behind, the hind angles distinct but rounded, base slightly arcuate; elytra oblong, a third longer than broad. Lassen, Sierra and Siskiyou Counties, California.....
martini Van Dyke
- Thorax with sides gradually rounded into base, the hind angles almost obliterated, base arcuate; elytra oblong-oval, not a third longer than broad. (Specimens not examined.) Western Nevada.....*nevadensis* Horn
14. (12) Thorax narrowed basally, disc with two types of punctures, very fine and rather coarse; base usually with a marginal line at least at middle.....15
- Thorax quadrate, with no trace of basal marginal line, surface alutaceous, with not more than a dozen large variolate punctures on the disc and no trace of fine punctures, the punctures moderately dense along the lateral margin; clypeus granulate, its apex very widely but not deeply emarginate, the angles broadly rounded; elytral

striae very fine, the punctures hardly obvious, the intervals flat, with extremely minute punctures. Washington.

lanei, new species

15. (14) Elytra oblong-oval, hardly narrowed basally, puncturation at intervals very distinct. Clypeus very granulate, apex widely not deeply emarginate, the angles narrowly rounded, vertex very densely punctate with coarse and fine punctures intermixed. Thoracic disc with fine punctures, and with moderately coarse, scattered, and variolate punctures, the latter denser at sides; basal line obvious only at middle. Elytra with fine striae, the puncturation very fine and not dense, intervals flat and the moderately dense punctures very obvious. Washington.....

washtuca Robinson

Elytra much more oval and narrowed basally, puncturation of intervals not unusually distinct. Clypeus coarsely granulate, apex narrowly rounded, vertex densely punctate. Thoracic disc with very minute punctures and also with extremely coarse and variolate punctures, the latter irregularly but moderately densely distributed; basal marginal line distinct only at middle. Elytra with fine striae, the punctures fine and sparse, intervals flat and with very minute and inconspicuous punctures.

Central California.....*rugoclypeus* Hinton

***Aphodius lanei*, new species.**

Elongate, robust, piceocastaneous above. Clypeus very widely and moderately-deeply emarginate, the angles narrowly rounded; genae obtusely rounded; disc with very fine punctures, the apical three-fifths rugose and subgranulate; vertex with fine punctures intermixed with only a few slightly larger punctures on each side (there is much less difference in size between these two types of punctures than in most species). Thorax quadrate, sides nearly parallel, not narrowed behind, entire base not margined; disc alutaceous, impunctate except for a dozen highly scattered and very coarse punctures, these closest at sides (no really fine punctures, as common in most species in the group, are visible). Elytra with rounded humeri; striae fine and the intervals faintly convex, the punctures of both hardly obvious. First segment of the hind tarsus equal to the following three in length; bristles of the posterior tibial apex apparently unequal. Mesosternum slightly carinate between the coxae. Front tibia with the apical tooth bluntly truncate at apex, the inner spur curved apically. Wings vestigial, represented by a membranous piece narrower than the hind tibia and only one-third the length of the abdomen. Length 9 mm. Width 4.5 mm.

The unique *Holotype* is in the United States National Museum (#54080), and bears the data: "Blue Mts., Godman Spr., Washington, 6,000 feet elevation, July 7, 1929. M. C. Lane, collector."

Aphodius caseyi, new species.

Elongate, body definitely constricted between the elytra and thorax, elytra rather pointed apically, giving the body a pointed aspect posteriorly. Color piceous, shining. Clypeus with a moderately deep and wide emargination, the angles narrowly rounded; genae nearly rectangular; disc with very fine and dense punctures, apical half very coarsely rugose and slightly granulate; vertex with large and small intermixed punctures. Thorax with entire and strongly marked basal line, sides nearly evenly arcuate but distinctly narrowed behind; disc with very fine and dense punctures, intermixed with very coarse and variolate, irregularly but rather sparsely scattered punctures. Elytra with humeri rounded; striae fine and with fine and relatively sparse punctures; intervals flat, with very fine and regularly placed punctures. First segment of the hind tarsus equal to the next three combined. Apex of hind tibia rather worn, but the bristles apparently equal. Mesosternum carinate between the coxae. Front tibia not worn, the apical tooth bluntly truncate at apex, the inner spur curved apically (? sexual character). Wings vestigial, being represented by a very narrow membrane one-third the length of the abdomen and narrower than the width of the hind tibiae. Length 10 mm. Width 4.5 mm.

The unique male *Holotype* is in the Casey collection at the United States National Museum (#54081) and is from Oregon.

Aphodius pullmani, new species.

Elongate, robust, castaneopiceous. Clypeus with a broad, moderately deep emargination, the angles narrowly rounded; genae rectangular; disc entirely and regularly punctate, with very fine punctures of one size only, the apex very faintly rugose; vertex with fine punctures as on clypeus and also a group of larger punctures near each side. Thorax broad and nearly quadrate in shape, with complete and well-marked basal margin, the sides but little narrowed behind, very faintly sinuate near the hind angles: disc alutaceous without the usual very fine punctures, the only punctures being coarse and variolate and only sparsely and very irregularly scattered on the disc, but a little closer together at sides. Elytral humeri rounded; striae fine, with fine, sparse and not at all obvious punctures, the intervals slightly convex and with extremely fine, hardly discernible punctures. First segment of the hind tarsus equal to the next three in length. Bristles at the apex of the hind tibia apparently unequal. Mesosternum slightly carinate between the coxae. Front tibia worn; inner spur stout and curved apically. Wings vestigial, about two-fifths the length of the abdomen and narrower than the width of the hind tibia. Length 10 mm. Width 4.6 mm.

The unique *Holotype* is in the United States National Museum (54082) from "Pullman, Washington, on snow, November 28, 1918, C. V. Piper."

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RHACOPHORUS AND A NEW PHILAUTUS
FROM CEYLON.

BY BENJAMIN SHREVE.

Some years ago I was engaged in identifying a collection of reptiles and amphibians from Ceylon made by W. L. Schofield in 1933, and generously presented to the Museum of Comparative Zoology by Thomas Barbour. At the time I was studying this collection, I noted two apparently new species of frogs to which, because of other duties, I was unable to give attention until now.

Rhacophorus dimbullae, sp. nov.

Type.—Museum of Comparative Zoology no. 20878, a female, from Queenwood Estate, Dimbulla, 5000 feet, Ceylon, collected by W. L. Schofield in 1933.

Diagnosis.—Allied to *Rhacophorus fergusonii* Boulenger,¹ from which the new form differs in the shape of the vomerine teeth, in possessing less webbing of the feet, and in coloration. It is also allied to *Rhacophorus stictomerus* (Gunther) from which the new form differs in having a larger tympanum, decidedly larger disks on hands and feet, and in coloration.

Description.—Vomerine teeth in two fairly long, oblique groups between the choanae starting close to their inner front edges; no papilla on the tongue; snout broad, obtusely pointed, a little longer than the diameter of the orbit; canthus rostralis distinct; loreal region concave and somewhat oblique; nostril nearer the tip of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum half the diameter of the eye; first finger shorter than the second; fingers with a rudiment of webbing; disks of fingers and toes large, those of the two outer fingers almost as large as the tympanum; toes about two-thirds webbed, somewhat less than one phalanx of the third and fifth, and nearly two of the fourth free; subarticular tubercles of feet and hands moderate; the tibio tarsal articu-

¹ This is the form which E. Ahl renamed *R. fergusonianus* as it was preoccupied by *Ixalus fergusonii* of Gunther, the latter now being regarded as a synonym *Philautus femoralis*. For those who do not recognize *Philautus* Ahl's name should be used.

lation of the adpressed hind limb reaches the tip of the snout; upper parts finely granular; a fold above the tympanum; belly and lower surface of thighs granular; chest and underside of lower jaw less granular.

Coloration in alcohol.—Above, light grayish brown with a rather indistinct dark brown crossband between the eyes and an indefinite, inverted, more or less U-shaped figure on the back equally ill defined and of the same color, this figure with several extensions of pigmentation, anteriorly especially; limbs with crossbands also of the same color, those on the tibia being rather oblique; a narrow, rather obscure, dark brown streak from the tip of the snout to the eye, just below the canthus rostralis, another streak, similar to the first, but almost black, bordering the supratympanic fold below; posterior aspect of thigh spotted and reticulated with dark brown; sides spotted with dark brown; below, yellowish white, chest, underside of lower jaw and of limbs more or less suffused with dark brown.

MEASUREMENTS.

	Length head and body	head	hind limb	4th toe
Type No. 20878.....	47 mm.	18 mm.	82 mm.	15 mm.

Philautus eximius, sp. nov.

Type.—Museum of Comparative Zoology no. 20879, a gravid female, from Queenwood Estate, Dimbulla, 5000 feet, Ceylon, collected by W. L. Schofield in 1933.

Paratypes.—Museum of Comparative Zoology nos. 20880–20884 with the same data as the type.

Diagnosis.—Allied to *Philautus variabilis* (Gunther) from which this new form differs in having a papilla on the tongue, more fully webbed toes, and it appears also to differ in coloration (both are variable in coloration).

Description.—Tongue with a small obtusely pointed papilla in the anterior part of the median line (absent or indistinct in the four smaller paratypes); snout subacuminate, almost rounded, as long as the diameter of the orbit; canthus rostralis distinct; loreal region oblique and concave; nostril nearer to the tip of the snout than to the eye; interorbital space broader than upper eyelid; tympanum indistinct, about half the diameter of the eye; first finger shorter than the second; fingers with a rudiment of webbing; disks of fingers and toes rather large, those of the two outer fingers almost as large as the tympanum; toes about three-quarters webbed, third and fifth digits webbed almost to the disk; fourth toe with approximately one and a half phalanges free (in the four smaller paratypes about two-thirds webbed, with about one phalanx of third and fifth and about two of fourth free); subarticular tubercles of feet and hands moderate; the tibio-tarsal articulation of the adpressed hind limb reaches the eye; upper parts finely granular; a fold above the tympanum; belly and lower surface of thighs granular, chest and underside of lower jaw less granular.

Coloration in alcohol.—Above, orange pink, vermiculated and marked with dark gray including a broken crossband between the eyes and a very

irregular bar on the back, on each side, posterior to the head; limbs faintly cross-banded with brownish or grayish; below, whitish.

Two of the paratypes are colored above very much like the type except that the cross bars at the rear of head are absent; and from near the eye to the middle of the back there is a curved longitudinal streak of dark gray, broken into spots on one example. In the type there is what is apparently a faint indication of the posterior end of these lines; legs are a little more strongly banded in both paratypes than in the type. One paratype is more densely spotted and marked on the upper surfaces than the type; the other less so.

The three other paratypes are also like the type except that they are much darker above, two of them strongly suffused with gray, one of these so strongly that the ground color is almost completely hidden. The specimen without the suffusion has a faint indication of the same markings as the two paratypes mentioned in the preceding paragraph; the two suffused examples are unmarked.

MEASUREMENTS.

	Length head and body	head	hind limb	4th toe
Type no. 20879	36 mm.	13 mm.	56 mm.	10 mm.
Paratypes nos. 20880-84....	34-28 mm.	12-10 mm.	54-43 mm.	9-7 mm.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TEN NEW NEOTROPICAL BEETLES OF THE SCARAB
GENUS PHYLLOPHAGA.

BY LAWRENCE W. SAYLOR.

In this paper are described the following new species of
Phyllophaga:

Phyllophaga (? **Chirodines**) **oaxena**, new species.

Male.—Elongate oval. Dull rufocastaneous, the thorax slightly shining. Above entirely clothed with short, dense, suberect, brownish hairs, those of head a little longer and more erect. Clypeus and front coarsely, rugosely, very densely and contiguously punctate. Clypeus very short, somewhat semicircular in outline though transverse, the apical margin slightly reflexed. Antenna uni-colorous, 10 segmented; club very slightly longer than the entire stem, segments 3-7 each slightly transverse. Thorax with sides entire, and straight, before and behind the moderate median dilation, with several scattered cilia; base without marginal line; front angles rectangular to nearly subacute; hind angles obtusely angulate; disc with fine, dense, regularly placed punctures over the entire surface, with a faint suggestion of a median longitudinal carina. Elytron without stria except for the well-developed sutural stria, the latter obsolescent at base; disc subrugose, punctured as thorax. Pygidium convex, pruinose, with very fine, dense and regularly placed punctures, each with a short erect hair; apical margin explanate and somewhat reflexed. Abdomen with short, dense, suberect pile; middle widely and shallowly concave; 5th segment flattened, the apex arcuate and faintly produced, the disc with a very dense patch of fine, though somewhat transverse, granulations; 6th nearly as long as the 5th, and raised a little above it,—disc of 6th impressed transversely, apex carinate and ciliate, the base sinuate at middle and raised and produced slightly, the center of the sinuation reaching apically and nearly attaining the apical margin of the segment. First segment hind tarsi shorter than the second. Hind tibial spurs acute and unequal, one two-fifths longer than the other, and slightly distorted. Transverse carina on mid tibia only about half complete, external margin not serrate; carina of hind tibia very faintly indicated and not entire. Segments 1-4 of front tarsus with the inner apex of each segment prolonged into a broadly rounded

lobe-like tooth, that of the first segment the largest and the following becoming progressively shorter. Male genitalia small and simple, of the complete ring-shaped type, and bilaterally symmetrical. Claws of all the tarsi entirely simple, with at most a trace of a very fine serration on the lower margin; the outer claw of each front tarsus with a faint trace of a tiny tooth placed basad from the middle of the claw. Length 20.5 mm. Width 10.3 mm.

The unique male *Holotype*, which remains in the Saylor Collection, is from "Oaxaca, Mexico." This very interesting species presents somewhat of a problem as to its proper place in our taxonomic sequence of subgenera and species. Its affinities approach *Chirodines* the closest, though I leave it here with reserve. The new species differs especially from *Chirodines zunilensis* Bates (only described species in that genus) in the weak and obsolete tibial carina (as opposed to strong and entire carina), in the basically different type of genitalia, and in more minor details of the claws and pilosity of the dorsal surface.

Phyllophaga (? Phyllophaga) apolinari, new species.

Male.—Elongate, subparallel. Dark piceocastaneous, slightly shining and glabrous dorsally. Front and clypeus with coarse variolate punctures, those of front sparse and those of clypeus smaller and much denser. Front below vertex with a transverse gibbose elevation running from eye to eye, the surface of this subcariniform area rugosely and densely punctate, the area behind on vertex and occiput with extremely dense and very fine punctures. Clypeus very short, broad, and transverse, apex widely and shallowly emarginate, the angles very broadly rounded, margin not reflexed; center of disc at base impunctate. (Antenna lacking in unique type.) Labrum quite large and very deeply and narrowly incised, thus appearing strongly bilobate. Sides of thorax very arcuate, the widest point just behind the middle; sides crenate in anterior half, simple behind; hind angles broadly rounded, front angles produced and rectangular; front margin not thickened, posterior margin obsolete near middle; disc with fine, moderately-sparse, irregularly-placed, and variolate punctures, these separated by one to four times their diameters on disc and closer at sides and near front, center disc with small, irregular impunctate area. Elytron with four well-marked stria in addition to the well-developed sutural stria; first stria complete, oblique, and strongly widened apically; 2nd stria parallel to first; 3rd narrow and running from the humeral umbo to the apical umbo; 4th narrow and running from the humeral umbo down to the lateral margin and then running along parallel to the latter; first three striae becoming obsolete apically at the apical umbo; disc rugosely punctured, the punctures moderately dense. Pygidium polished and slightly convex, punctures dense, coarse, variolate, and regularly placed; apex broadly rounded and not ciliate. Abdomen polished, gibbose, and nude at middle, the sutures hardly obvious, entire 5th segment transversely impressed, sparsely punctate, the sides pruinose and pilose; 6th segment three-fifths the length of 5th, flat, with moderately coarse and somewhat sparse punctures. First segment of hind tarsus distinctly longer than, and larger

than, the second. Hind spurs free and graceful, the longest one much longer than the first segment of the hind tarsus. Transverse carina of hind tibia well marked and complete, the inner edge of it prolonged into a short, sharp lobe. First segment of mid tarsus equal to the next two combined; transverse carina completely lacking, evidenced only at each side margin by a sharp lobe. Inner lower edge of front femora strongly produced inwardly into a sharp, robust "spur." All tarsi with a sharp median tooth, the base obtusely dilated. Male genitalia very peculiar for the genus: lateral lobes soldered together into a broad tube, from the lower outer apex of which emerge two long and slender projections which converge towards the center and touch tips there; aedeagus with a strong globose structure at each side, these structures projecting halfway out of the inside of the lateral lobes and tip of each with a sharp tooth which projects outwardly. Length 29 mm. Width 14.5 mm.

The unique male *Holotype*, in the Saylor Collection, was given to me by Mr. Apolinar-Maria who collected the specimen at "Saigon, Columbia." Although this species appears to be more similar to certain Oriental forms of the genus, I do not doubt that it is correctly labeled since I received it unmounted from the collector along with a number of species all of which were without doubt of Columbian origin. I leave it in the present subgenus with much doubt, since the non-carinated middle tibia, the very different type of male genitalia and the subcarinate vertex, appear to mark out a definite group of its own.

Phyllophaga (Phyllophaga) rolbakeri, new species.

Male.—Elongate, subparallel. Black, legs somewhat rufopiceous. Moderately shining above and apparently nude. Clypeus and front very densely, coarsely and entirely punctate; upper half of front and vertex impunctate. Clypeus shallowly and widely emarginate apically, the angles extremely broadly rounded. Antenna 10-segmented; club small and ovate, equal to segments 4-7 combined. Thorax with sides subparallel behind the median dilation and nearly entire; front and hind angles nearly rectangular; basal margin widely interrupted at middle; disc with an irregular longitudinal smooth area at middle, remainder with moderately dense, coarse, and umbilicate punctures. Each elytron with two striae other than the sutural; sutural stria slightly narrower at base, first stria oblique and very distinctly wider apically, the second stria of nearly equal length throughout and also obliquely placed; disc punctured as thorax and somewhat rugosely so. Pygidium convex, rugose, the punctures coarse, umbilicate and somewhat sparse, with very small and erect, sparse hairs. Abdomen moderately convex, highly polished and nude at middle; 5th segment slightly transversely impressed just before the apex, with moderately dense and somewhat fine punctures at middle; 6th segment one-half length of 5th, and transversely impressed and the surface minutely granulate. All claws with a strong, long, median tooth, the basal dilation rectangular. First two segments of front tarsi each with a small spine at inner apex. Second segment of tarsus of hind leg slightly longer than the first. Hind spurs free

and graceful. Mentum with a moderately-wide, well-marked, V-shaped impression. Male genitalia simple, bilaterally symmetrical, and the two lateral lobes slender and somewhat parallel moderately widely separated at apex. Length 26 mm. Width 11.7 mm.

The unique male *Holotype*, from "Buena Vista, Encantada, Coahuila, Mexico, 6000 feet, July 7, 1938, R. H. Baker collector" is in the Saylor Collection. This fine species, which is nearest *atra* Moser but quite distinct from it, is named for my good friend Rollin H. Baker, of Texas, who collected and presented the specimen to me.

Phyllophaga (Phyllophaga) ginigra, new species.

Male.—Elongate and subparallel. Entirely black, shining, and apparently glabrous above. Clypeus and front moderately coarsely, densely and variolately punctate. Clypeus short, subrugosely punctate, apex very narrowly emarginate in the shape of a shallow U at center, the angles extremely broadly rounded. Antenna 10-segmented; club very small, scarcely equal to segments 3-7 in length. Thorax with sides straight each side of the median dilation, margin entire and not ciliate; front angles and hind angles obtuse but nearly rectangular; basal margin nearly obsolete at middle; disc with coarse, moderately dense, and umbilicate punctures, the center disc with a longitudinal, median, impunctate area. Scutellum with very dense and smaller punctures at sides, center impunctate. Elytron with sutural stria noticeably broader apically and with one other strongly oblique stria on each elytron; disc densely, coarsely and umbilicately punctate; apex coarsely rugose. Pygidium apparently nude, faintly convex; disc very rugose and with sparse and umbilicate punctures, these punctures very dense along the basal margin. Abdomen strongly convex, polished, nude at middle and with fine, moderately dense punctures; 5th segment declivous apically, with a small patch of coarse punctures at center, apical one-fourth of segment transversely impressed; 6th segment shorter than 5th and transversely impressed and rugosely wrinkled. Claws short and with a strong, median, rather long tooth, the basal dilation small but rectangularly produced. Hind tibial spurs free, graceful. First two segments of hind tarsi subequal in length. Mentum very widely and longitudinally sulcate, the edges subcarinate. First two segments of front tarsi with very short inner apical spines. Male genitalia large and rather peculiar in shape, though bilaterally symmetrical; in addition to the two long and slender lateral lobes there is an overhanging (in en face view) lobe arising from the upper margin of the "ring" and reaching three-fifths the length of the lateral lobes; the aedeagus is very large and heavily chitinized. Length 26 mm. Width 12.5 mm.

The unique male *Holotype*, from "Mexico," remains in the Saylor Collection. The species is abundantly distinct from all described *Phyllophaga* known to me, but is probably nearest *atra* Moser in its affinities.

Phyllophaga (Phyllophaga) abcea, new species.

Male.—Oblong-oval, wider behind, testaceocastaneous, the head and thorax rufous. Shining above; head with the front, and the thoracic

margin, with moderately long and erect hairs, otherwise glabrous above. Clypeus and front with coarse, variolate punctures, those of front only slightly impressed, those of clypeus smaller and slightly denser; clypeus transversely subarcuate, the middle finely emarginate, margin scarcely reflexed. Antenna unicolorous castaneous, 10-segmented; club equal to segments 3-7 in length. Thorax with sides nearly entire, and straight before and behind the median dilation; base not margined; front and hind angles obtusely rounded; disc with moderately coarse and variolate, but still quite sparse, punctures. Elytron with a faint indication of a second stria other than the well-developed sutural stria, the latter obsolete at base; disc rugosely and very densely punctate. Pygidium highly polished, glabrous, very convex; disc with very sparse and scarcely impressed punctures. Abdomen robust, highly polished and nude at middle; 5th segment declivous, with a patch of fine but moderately dense granules at center; 6th segment nearly as long as 5th and transversely flattened, also with fine and moderately dense granules. First segment of hind tarsus longer than the second. Hind spurs free, graceful, shortest slightly curved. All claws short and widely cleft, the median tooth of the same proportions as apical but obliquely truncate at apex; base obtusely angulate and not produced. Male genitalia with the lateral lobes prolonged, subparallel, and not quite contiguous at tips; upper center of the ring formed by the lateral lobes with a broad projection reaching over and nearly to the tips of the lateral lobes, the apex of this projection widely lobate at each outer apical angles and the center of the projection slightly longitudinally channeled. Length 14 mm. Width 7 mm.

The unique male *Holotype*, from "Guatemala," remains in the Saylor Collection. It is most closely related to *P. parumpunctata* Bates, from which it may be separated by the dorsal pilosity, abdominal characters, larger antennal club and male genitalia.

Phyllophaga (*Listrochelus*) *valia*, new species.

Male.—Ovate, rufous; elytra subpruinose, otherwise shining above. Head and thorax glabrous, elytra with very sparse, short and erect hairs. Front and clypeus rather coarsely and densely punctate, the vertex with a distinct transverse carina. Clypeus subtruncate at apex and faintly reflexed, the angles somewhat narrowly rounded. Antenna rufous, 10-segmented; club testaceous, slightly longer than the funicle. Thorax with sides crenate and ciliate, sides straight before and behind the conspicuous median dilation; base with complete marginal line, apex with thickened border; front angles rectangular, hind angles very obtusely angulate; disc with moderately dense, somewhat fine, variolate punctures, these much closer at front and sides. Elytron with sutural stria obsolete apically and basally; other striae not present; disc subrugose, punctures moderately coarse but more sparser than on the thoracic disc; apex of each elytron broadly truncate. Pygidium convex, the surface pruinose at base, and polished apically; punctures rather regularly placed, moderately dense, and moderately coarse, the basal area with short and erect hairs. Abdomen flattened and pruinose at middle; 5th segment plane; 6th segment one-half the length of

the 5th and with a conspicuous longitudinal sulcus. First segment of hind and middle tarsi slightly longer than the second. All claws similar, each pectinate along a single margin, the pectinations rather small, and without any larger intercalated teeth. Male genitalia bilaterally symmetrical, and of rather simple design, the lateral lobes subparallel and contiguous at tips but not joined, their apices bluntly but acutely rounded. Length 10.5 mm. Width 5.7 mm.

The unique male *Holotype* was collected for me by A. Meade at "Valerio Trujano, Oaxaca, Mexico, on July 27, 1937" and remains in my collection. The species is not closely related to any of the described forms.

Phyllophaga (*Listrochelus*) *durango*, new species.

Male.—Oblong ovate, rufocastaneous, thorax rufous. Elytra pruinose, otherwise shining above. Thorax glabrous. Clypeus and front with moderately coarse punctures, those of clypeus very dense, those of front much less dense, the latter with several short and erect hairs. Clypeus long, apex truncate and somewhat reflexed, the angles very broadly rounded; elytral suture forming two complete sinuations, the surface just basally of the suture, on the front, with a narrow impunctate band. Antenna castaneous, unicolorous, 10-segmented; club about one-fifth longer than the funicle. Thorax with the sides straight before and behind the semi-arcuate median dilation and with very long cilia, the margin also crenate in apical half of thorax and subrenate in basal half; front and hind angles obtusely subangulate; base with complete marginal line; disc with fine and moderately dense punctures, these closer along the front margin. Elytron without stria except for the well-developed sutural stria; surface subrugose, the disc with fine and moderately dense punctures and sparse erect hairs, those at base moderately long and decreasing apically where they are very much shorter; lateral margins with moderately dense cilia. Pygidium convex, polished except for a small basal pruinose area; disc with very fine and dense punctures and each bearing a long and erect brownish hair. Abdomen flattened, faintly concave at middle and semipolished; 5th segment with a slight longitudinal median sulcus in the apical portion; 6th with distinct longitudinal sulcus. All claws pectinate along a double margin, the pectinations of moderate size and each claw with a larger, narrow, intercalated tooth at about the middle. First segment of the hind tarsus subequal to, or faintly shorter than, the second. Male genitalia bilaterally symmetrical, the lateral lobes (in en face view) subparallel but not contiguous at apex, and each with a blunt triangular tooth arising from the upper margin and situated just before the apex, this tooth pointing outwardly from the center; sides of each lateral lobe concave. Hind tarsi longer than the tibia.

Female.—Antennal club ovate; pygidium very convex and highly polished, with very short and sparse hairs; abdomen semiconvex, all tarsal claws with a strong median tooth, the surface between this tooth and the base minutely dentate along a single margin; hind tarsi equal to the tibia, otherwise similar to the male. Length 14.5 mm. Width 7.5 mm.

The *Holotype* male and *Allotype* female, both in the Saylor Collection, are from "Durango, Durango, Mexico." This species is closely related to *L. durangoensis* Moser but differs especially in the smaller size, different color, longer male antennal club, non-minute elytral hair, and the first elytral costa is not distinct.

Phyllophaga (*Listrochelus*) *bueta*, new species

Male.—Oblong oval, thorax shining, elytra pruinose, glabrous above except for the minute elytral hairs. Coloration rufocastaneous, the thorax rufous. Clypeus and front with very dense, contiguous, moderately coarse, variolate punctures; vertex with a moderate transverse carina. Clypeus rather long, the apex nearly truncate and hardly reflexed, the angles narrowly rounded. Antenna rufotestaceous, 10-segmented; club one-sixth longer than the funicle. Thorax with sides faintly crenulate, with moderately long cilia; sides straight before and behind the moderate median dilation; base with entire marginal line, apical marginal line thickened and entire; front angles obtuse, hind angles obtusely rounded; disc with moderately fine, somewhat sparse punctures, and with a faint indication of a median impunctate area. Elytron with a well-developed sutural stria and with a second stria starting two-fifths of the way from the base and continuing apically, becoming obsolete at the apical umbo, the latter stria also widening constantly towards the apex and becoming four times wider at the apex than at the base; disc punctured as thorax, the punctures slightly closer at sides and with minute hairs in the punctures. Pygidium polished, convex, with sparse fine punctures and with short suberect hairs. Abdomen flattened, pruinose at middle and sides; 5th segment plane; 6th segment two-fifths the length of the 5th, and more coarsely punctate. Spurs of hind and middle tibia slender, one nearly twice the length of the other. First segment of the hind and middle tarsi slightly longer than the second. All claws with a very small triangular tooth situated just slightly basad from the middle, the surface between the tooth and the base slightly crenate. Front tibia slender and tridentate, the teeth approximately equidistant. Male genitalia entirely bilaterally symmetrical, the lateral lobes not joined nor contiguous at tips, but consisting each of a bluntly rounded lobe; aedeagus strongly chitinized and with a narrow spur at apex which is bidentate at the tip. Length 12.5 mm. Width 6.5–7 mm.

The *Holotype* and *Paratype*, both males, are from "Buena Vista, Sierra de la Encantada Mts., Coahuila, Mexico, elevation 7000 feet, coll. July 7, 1938, by R. H. Baker," and were presented to me by the collector. They remain in the Saylor Collection. This species is most closely related to *texensis* Saylor, but can be distinguished by the non-impressed abdomen, less convex pygidium, much more obvious elytral striae and the different male genitalia.

Phyllophaga (*Phytalus*) *guatemala*, new species.

Male.—Elongate, subparallel. Strongly shining and apparently glabrous above. Color rufotestaceous, the head and thorax rufous. Clypeus and front coarsely, variolately and rather densely punctate, vertex smooth and

impunctate. Clypeus rather long, apex narrowly emarginate, giving a bilobed appearance, the angles very widely rounded, apex not reflexed. Antenna 10-segmented, and quite large, segment 7 transverse; club slightly longer than the entire stem. Thorax with sides parallel behind the slight median dilation, straight and convergent in front of the dilation, the margins with sparse cilia; front angles obtuse but distinct; hind angles nearly rectangular; base with a complete marginal line; disc sparsely and not coarsely punctured, more closely punctate near sides and front margins. Elytra punctured as thoracic disc, slightly rugose. Pygidium slightly convex, highly polished, faintly rugose, with very sparse and irregularly placed, fine punctures, with a few short hardly obvious testaceous hairs; apex distinctly and narrowly rounded, the margin reflexed and ciliate. Abdomen highly polished, glabrous at middle and the latter widely but faintly concave; 5th segment plain; 6th three-fourths the length of the 5th and very faintly and longitudinally concave at middle, with a few coarse and setigerous punctures near the sides. Claws all very finely cleft, the apical tooth noticeably shorter and also less robust than the lower tooth. (Lower spurs of hind tibia lacking in type, apparently broken off.) Upper spur of hind tibia rather long and robust and very strongly curved at about the middle. First two segments of the hind tarsi nearly equal in length. Male genitalia bilaterally symmetrical, rather simple in structure and with the tip of each lateral lobe somewhat hairy; aedeagus strongly chitinized and moderately large. Length 18.5 mm. Width 8 mm.

The unique male *Holotype*, from "Guatemala," remains in the Saylor Collection. This species differs from all described *Phytalus* known to me in the presence of the long and curved hind spur, much as in our *Phyllophaga hamata* and *P. torta*.

Phyllophaga (Phytalus) oaxaca, new species.

Male.—Oblong ovate, shining and glabrous above. Color rufocastaneous, the thorax more rufous. Front and clypeus with somewhat coarse variolate punctures, these dense on clypeus and much sparser on front. Clypeus flat and transverse, the apex subtruncate and slightly reflexed, the angles very broadly rounded. Antenna 10-segmented, unicolorous castaneous; club subequal to funicle. Thorax with sides straight and subcrenate behind and before the arcuate median dilation, with very sparse and short cilia; front and hind angles obtusely angulate, the former somewhat more distinctly indicated; base not margined, front marginal line thickened; disc with small, sparse variolate punctures, these separated by one to three times their diameters on disc and a little closer at sides. Elytron with or without striae other than the well-developed sutural stria,—often with a second stria weakly indicated; disc with fine and very sparse punctures, these denser at sides. Pygidium polished, slightly convex, and apparently glabrous; disc with moderately sparse and variolate punctures. Abdomen polished and glabrous at middle, and slightly gibbose; 5th segment with a wide, shallow, and declivous fovea starting at the center base, the surface of the fovea with fine, dense, transverse granulations, the sides of the fovea raised and semi-carinate; 6th segment one-

third the length of the 5th, and transversely impressed, the apical and basal margin faintly carinate. All claws finely cleft, the upper tooth as long as, and slightly broader than, the apical, the tip of the upper tooth obliquely truncate. Hind tibial spurs free and graceful. First segment of hind tarsus shorter than the second. Male genitalia very simple, bilaterally symmetrical, somewhat tube shaped, though short.

Female.—Pygidium flatter, and slightly more densely punctate; abdomen with 5th and 6th segments plane and densely punctate; antennal club moderately long and equal to segments 3-7 combined; second costa of elytron usually well indicated and widening considerably in the apical third. Otherwise as in the male. Length 11-14.5 mm. Width 5.2-7.8 mm.

The *Holotype* male and *Allotype* female, and numerous *Paratypes*, from "Oaxaca City, Oaxaca, Mexico, 5000 feet, July 16-25, 1937," and collected for me by Al Meade and Mel Embury, remain in the Saylor Collection. *Paratypes* will be deposited in the United States National Museum. This species is closely related to *nubipennis* Bates, but may be separated by the non-wrinkled and less densely punctate pygidium, much less densely punctured elytra and less obvious striae (1st stria, if present, indistinct and broad, not distinct and very narrow), more coarsely crenate thoracic margins in the apical half, much more distinct and deeper 5th abdominal fovea, and somewhat different male genitalia.

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PALATAL SESAMOID BONES AND PALATAL TEETH
 IN *CNEMIDOPHORUS*, WITH NOTES ON
 THESE TEETH IN OTHER SAURIAN
 GENERA.

BY EDWARD H. TAYLOR. R* OCT 4

In studying the prepared skulls of lizards belonging to *Cnemidophorus* and *Ameiva* I have noted the presence of a pair of small sesamoid bones lying below the pterygoid processes of the basisphenoid, and often extending over the edge of the pterygoid. When the surfaces were moistened the elements were easily movable proving that they were not ankylosed to the palatal bones. A few specimens of preserved alcoholic specimens were dissected and it was found that these bones were imbedded in what appeared to be a muscle tendon which attaches to the inner edge of the pterygoid anterior to the point of contact of the pterygoid process and the pterygoid bone. The dorsal surface of the sesamoid thus moves over the surface of the palatal bones and when dried they adhere to their surfaces. When the tissues are eaten away by dermestid larvae the sesamoids appear to be an integral part of the palate.

These elements, first observed in *Cnemidophorus guttatus* from Guerrero, Mexico, were found to be also present in the skulls of *C. sexlineatus*, *burti*, *tessellatus*, *perplexus*, *gularis*, *grahami*, *deppii*, *melanostethus*, and likewise in many unidentified skulls. They were not absent in any of the 106 skulls examined although occasionally they were detached. They were present in *Ameiva undulata* which is the only species of that genus available to me at present.

I have examined some 200 skulls of lizards belonging to other families, all prepared by the same (dermestid) method and in none do I find sesamoid bones present. In ten alcoholic specimens dissected, I was likewise unable to demonstrate their presence in the palatal region.

In several genera of lizards I find a small ossified element intercalated

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between the end of the pterygoid process of the basisphenoid and the pterygoid bone, which has the appearance of an epiphysis. In some cases this adheres to the process and if, as may occur (*Phrynosoma*) the process does not contact with the lateral groove on the pterygoid but has a free edge exposed, this may assume the appearance of the sesamoid of the *Teiidae*. I do not believe, however, that they are in any sense homologous. In a skull of *Varanus* this element appears to be ankylosed to the pterygoid rather than to the end of the pterygoid process. What the history or significance of this small element is I can not say.

The presence of palatal teeth in modern Sauria has been regarded as being of significance in determining whether a given species or genus was primitive and ancestral, or recent and derivative. Camp (1923) states: "I should consider the simple presence of teeth on the palate as paleotelic. Such teeth would seem to be ancestral owing to lack of development in secondary lines of descent and prevalence of teeth in greater numbers in certain more ancient forms."

Since there are available here at Kansas University two collections of saurian skulls Kansas University Collection¹ KU and the E. H. Taylor-H. M. Smith Collection, EHT-HMS, which together number nearly 400, I have examined them for data on palatal teeth. In the literature dealing with these teeth there are certain contradictory statements and certain errors, which the following data will help to interpret or correct.

TEIIDAE. *Cnemidophorus*. Concerning the *Teiidae*, Cope (1900) quotes Boulenger as follows: "Pterygoid teeth are but seldom present, and if so but feebly developed." In Cope's osteological description of *Cnemidophorus* he makes no mention of the presence of teeth on the palatal bones. Camp (1923) gives but little concrete information on this point stating that according to authors cited pterygoid teeth are present "in some *teiidae*"; and later he states that the palate appears to be toothless "in some *Teiidae*."

Burt (1923) in his description of the genus *Cnemidophorus* states specifically and erroneously that there are no palatal teeth in the genus.

I have 106 *Cnemidophorus* skulls available. These include nine or more species. Teeth are present on the palates of all species and in all individuals save one or two specimens (or where the pterygoid is missing or the teeth have been removed in cleaning the skull). One case where teeth are wanting is that of a very young specimen. The species here listed have the following pterygoid tooth formulae (although all specimens have been examined only formulae of those with certain identifications are included):

Cnemidophorus perplexus (New Mexico and Arizona): 4-4, 2-2, 3-4, 5-6, 7-6, 6-4, 4-4, 4-5. In a very young Texas specimen I found no trace of pterygoid teeth.

Cnemidophorus gularis (Southern Texas): 3-3, 2-2, 4-2, 2-1, 3-2, 3-2, 4-3, 4-2.

Cnemidophorus grahami (Western Texas): 3-3, 3-3.

Cnemidophorus sexlineatus (Kansas and Texas): 3-3, 3-3, 1-1, 2-?, 3-2.

¹ I am indebted to Mr. Charles D. Bunker, assistant curator, for privilege of studying material in the Kansas University Collection.

Cnemidophorus tessellatus tessellatus (Western Texas to Arizona): 3-2, 3-2, 2-3, 3-3, 4-5, 3-4, 3-3.

Cnemidophorus melanostethus (Southern Sonora): 3-3, 0-0, 2-2, 2-2, 3-3, 4-3, 4-3, 4-4, 2-2, 2-1.

Cnemidophorus guttatus (Morelos and Guerrero): 3-1, 2-2, 2-2, 3-4, 3-2.

Cnemidophorus deppei (Guerrero and Colima): 2-2, 2-3, 3-?, ?-?, 6-5, 5-6, 3-4, 3-2, 3-3, 2-0.

Ameiva: Only two prepared skulls of *undulata* are available. In one of these the pterygoid teeth are absent (some evidence that teeth have been present), the other has one tooth on one side, and none on the other.

HELODERMATIDAE. *Heloderma*. Boulenger (1885, p. 300) states, concerning this genus, "teeth on the pterygoid and palatine bones." In three skulls of *Heloderma suspectum* Cope examined, I find the pterygoid formulae, 2-2, 2-2, 0-2 (much worn). No palatine teeth are present and there are no indications on the bone that teeth had ever been present. All are adult. A single preserved specimen of *Heloderma horridum* from Morelos has the pterygoid-palatine formula: 5-5, 1-1. The palatine teeth are near the posterior part of the bone and not far from the pterygoid series.

ANGUIDAE. *Ophisaurus*. Hilgendorff (1885) and Camp (1923) report the presence of teeth on prevomers and pterygoids of certain species of this genus. Camp states, (p. 365) "*Ophisaurus*, having the most dentigerous palate of all living lizards, is the only recent genus known to have prevomerine teeth² (df. Brühl, 1875-1888)."

Five specimens of *Ophisaurus ventralis* from Kansas show the following formulae for the pterygoid, palatine and prevomers respectively: 17-19, 5-6, 0-0; 27-24, 3-2, 0-0; 19-16, 3-2, 0-0; 9-11, 3-2, 0-0; 14-16, 3-3, 0-0. The pterygoid teeth are arranged in two or three irregular rows. The limited number of data on the absence of the prevomerine teeth in this species is not conclusive, but suggests strongly that they are absent at least in adults.

IGUANIDAE. *Crotaphytus*. Camp (1923, p. 365) states, "Genera of Iguanidae with such [pterygoid] teeth are given in Boulenger 1885: *Crotaphytus* 1 species with, 1 species without, *Sauromaulus hispidus*, *Dipsosaurus* . . ." The following formulae were found in specimens examined:

Crotaphytus wislizenii. Pterygoid teeth are 4-5; palatine teeth, 1-2. Only a single adult specimen from Boise, Idaho, was examined.

Crotaphytus reticulatus. This has a pterygoid formula of 15-12. I found no trace of palatine teeth in this adult specimen, from Starr Co., Texas.

Crotaphytus collaris collaris. Both pterygoid and palatine teeth are present in this form. A series from a single locality in Greenwood Co., Kansas, has the following formulae for the pterygoid and palatine teeth respectively (arranged from young to old): 3-3, 0-0; 6-6, 0-0 ♀; 6-7, 1-0 ♀; 7-7, 0-0; 10-7, 3-2; 8-10, 4-3; 12-11, 1-1; 12-14, 2-1. In the last two specimens some of the palatine teeth apparently have been lost, as

² Prevomerine teeth have been reported by Kingman (1932) as occurring in *Eumeces* (Scincidae). "At the posterior end of the plate near the median groove is found a pair of tooth-like processes that may be considered the homologue of prevomerine teeth."

evidenced by the presence of shallow grooves. Certain other specimens from various Kansas localities have the following formulae: 17-14, 3-3; 12-6, 0-0 ♂, 16-16, 0-0 ♂; 16-10, 2-0 ♀; 24-21, 2-5; 13-19, 2-3.

Crotaphytus collaris baileyi. The formulae for a young specimen is, 4-4, 0-0; for an adult 13-13, 2-1. Camp, *loc. cit.*, lists this form as lacking teeth. This statement may be true of some younger specimens.

In this genus it appears that the pterygoid teeth are acquired gradually from youth to adult age. The palatine teeth appear to be acquired at a later time and in some cases seem to be partially or totally lost with old age.

Dipso-saurus. A single form, *dorsalis sonoriensis*, lacks all trace of palatine teeth. The pterygoid teeth are as follows, in a series of skeletons from the type locality: 3-2, 0-0, 2-1, 4-2.

Sauromaulus. Camp reports pterygoid teeth present in *Sauromaulus hispidus*. In an old specimen of *Sauromaulus townsendi* from Guaymas Sonora, I find the following pterygoid formula: 1-0. *Sauromaulus obesus*. Three specimens from Arizona have the following pterygoid formulae: 6-8, 8-7, 0-1.

Holbrookia. Fifteen specimens belonging to seven forms of this genus show no trace of pterygoid or palatine teeth.

Uta. Twenty-nine specimens examined belonging to 11 species show no trace of any palatal teeth.

Sceloporus. Eighty-two specimens belonging to twenty-six species show no trace of palatal teeth.

Phrynosoma. Six specimens belonging to five species lack all trace of palatal teeth.

Basiliscus. Specimens of *Basiliscus vittatus* examined have no palatine teeth. The pterygoid teeth are, 6-1 + ♂; 5-7 ♀; 5-5.

Iguana. A single skull of *Iguana rhinolopha* has the pterygoid teeth in a short, transversely curved group, 5-6. No palatine teeth are present.

Ctenosaurus. Bailey (1928) states in his diagnosis of this genus, "pterygoid teeth present." Two specimens of *C. acanthura* have the following formulae: 12-4; 21-23. These are arranged in a double row. There are no palatine teeth.

Anolis. This genus is reported by Boulenger and Camp as having some forms with pterygoid teeth, some without. Two Mexican species examined, *nebulosus* and *nebuloides*, show no pterygoid or palatine teeth.

SCINCIDAE. *Eumeces*. Kingman (1933), has recorded the presence, and given figures, of the occurrence of pterygoid and vomerine teeth in this genus, based largely on the collections mentioned in this paper. I can add another species (*Eumeces copei*) which has a formula 2-2 for the pterygoid, and 1-1 for the vomerine teeth (in this specimen the processes do not appear to be enamel covered).

Mabuia. I have examined only the Mexican species, *Mabuia agilis*, of this genus. In this single specimen there is no trace of palatine teeth.

Leiopisma. In a single skull of *L. unicolor*, I find no trace of palatine teeth.

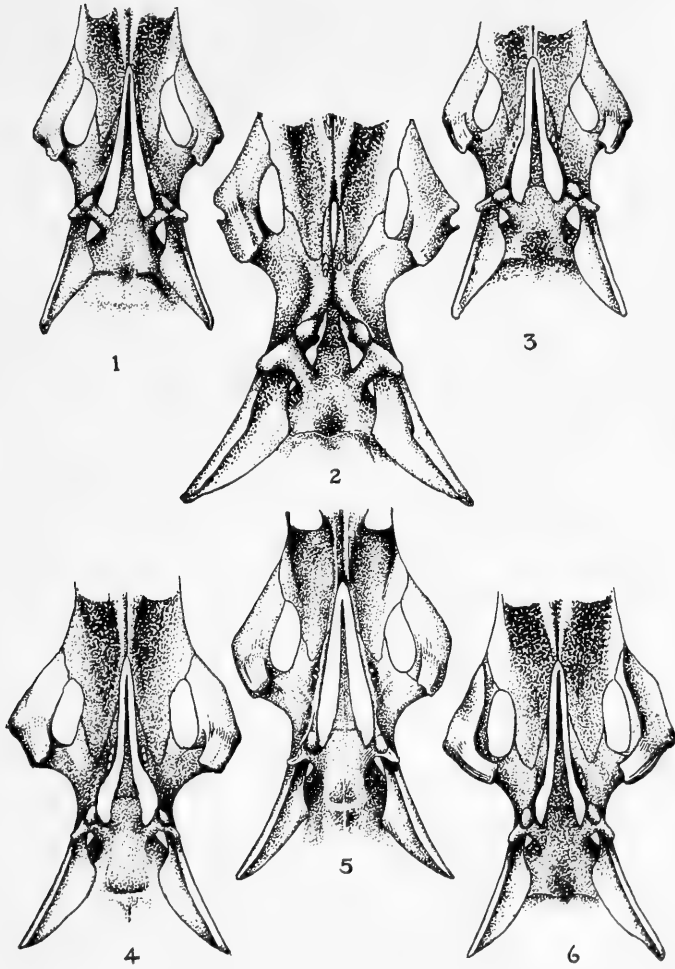


PLATE II.—TAYLOR, Palatal sesamoids and palatal teeth in *Cnemidophorus*.

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PLATE II. EXPLANATION OF FIGURES.

The palatal sesamoids will be seen as small nodules lying below (upon) the pterygoid processes of the basisphenoid, often contiguous with the pterygoid. The bones indicated in the drawings are: palatines, ectopterygoids, pterygoids, basisphenoid, and presphenoid. The pterygoid teeth will be observed near the inner interior edge of the pterygoid bone. All figures about $\times 4$.

- Fig. 1. *Cnemidophorus burti* Taylor. EHT-HMS No. 21076. Paratype. Near Guaymas (La Posa), Sonora, Mexico.
- Fig. 2. *Cnemidophorus guttatus* Wiegmann. EHT-HMS No. 21108. Organos, Guerrero, Mexico.
- Fig. 3. *Cnemidophorus sexlineatus* (Linne). EHT-HMS No. 21093. Benton, Texas.
- Fig. 4. *Cnemidophorus gularis* Baird and Girard. EHT-HMS No. 21090. San Sebastian, Texas.
- Fig. 5. *Cnemidophorus melanostethus* Cope. EHT-HMS No. 21086. Near Guaymas, Sonora, Mexico.
- Fig. 6. *Cnemidophorus deppii* Wiegmann. EHT-HMS No. 21109. Organos, Guerrero, Mexico.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

REPORT ON AN HERPETOLOGICAL COLLECTION
FROM THE SIERRA MADRE MOUNTAINS
OF CHIHUAHUA.

BY EDWARD H. TAYLOR AND IRVING W. KNOBLOCH.

The material on which the following report is based was collected by one of us (Knobloch) during the summer of 1939. Since the fauna of the Sierra Madre Occidental is but little known it seems important that the following records be published.

A specimen of *Crotalus*, perhaps related to *lepidus* and a small series of Ambystomid larvae await further study. Two forms, an *Eleutherodactylus* and a *Lampropeltis* are believed to be new, and are described elsewhere¹ by the senior author. (Numbers refer to the E. H. Taylor-H. M. Smith collection).

Bufo simus Schmidt.

Bufo simus Kellogg, Bull. U. S. Nat. Mus., No. 160, 1932, pp. 63-68, fig. 14.

Several specimens in the collection Nos. 18485, 23020-23025 belong to a form which has the tympanum concealed. When more specimens are available from Western Mexico it may be possible to demonstrate that *Bufo monksiae* Cope² is a legitimate species to which the present specimens may be referred.

Hyla arenicolor Cope.

This species is represented in the collection by a single specimen, No. 23009.

Rana pipiens Schreber.

Two young specimens, Nos. 23059-23060, are referred to this form.

Phrynosoma orbiculare orbiculare Wiegmann.

Two specimens are referred to this form (Nos. 23046-23047). The femoral and preanal pore series are respectively 24-24, 25-26. The preanal

¹ Copeia 1940

² Cope, Amer. Philos. Soc., 18, 1879, pp. 263-264.

part of the series tends to form a double row of pits which meet medially or are narrowly separated. The crown of the head is a little broader and the head somewhat shorter than in a specimen from near Mexico City.

These specimens give no evidence of a closer approach to *Phrynosoma douglassii hernandesi* or *P. douglassii douglassii* than do specimens from the southern part of the plateau that are available to me. And in consequence I am inclined to question the wisdom of associating *douglassii* and *hernandesi* as subspecies of this species.

Holbrookia maculata approximans Baird.

A single, very young specimen, No. 23048, is in the collection. It is referred with some hesitancy to this species, since adult color and markings are wanting.

Sceloporus jarrovi jarrovi Cope.

Sceloporus jarrovi jarrovi Smith, Univ. Kansas, Sci. Bull., XXIV, 1936 (1937), pp. 624-631., pl. XLVII, fig. 1; text figs. 17, 18; Zool. Ser. Field Mus. Nat. Hist.; Vol. 26, 1939, pp. 226-229, figs. 32, 33.

The series of specimens in the collection, Nos. 18973, 18979, 23034-23044, are quite within the limits of variation which Smith (*op. cit.*) has recorded.

Sceloporus poinsettii Baird and Girard.

Sceloporus poinsettii Smith, Univ. Kansas, Sci. Bull.; XXIV 1936 (1937), pp. 606-617, pl. LI, fig. 1; text figs. 14, 15; Zool. Ser. Field Mus. Nat. Hist., Vol. 26, 1939, pp. 223-225, fig. 30.

Four specimens, Nos. 23030-23033, are in the collection. These are typical specimens, the largest measuring 117 mm., snout to vent.

Sceloporus microlepidotus disparilis Stejneger.

Sceloporus microlepidotus disparillis Smith, Zool. Ser. Field Mus. Nat. Hist., 1939, pp. 191-197, fig. 18.

Five specimens are in the collection, Nos. 18980-18981, and 23010-23012.

Sceloporus undulatus virgatus Smith.

Sceloporus undulatus virgatus Smith, Occ. Papers Mus. Zool. Univ. Michigan, No. 387, Oct. 31, 1938, pp. 11-14. (Type description; type locality, above Santa Maria Mine, El Tigre Mountains, Sonora, Mexico.)

Dr. Hobart Smith has had the kindness to examine this series of small scelopori, and refers them to this recently described subspecies. Nos. 18972, 23049-23052.

Gerrhonotus kingii Gray.

Gerrhonotus kingii Gray, Ann. Mag. Nat. Hist., Vol. I, 1838, p. 390 (type description; type locality unknown).

Gerrhonotus nobilis Cope, Rept. U. S. Nat. Mus., 1898 (1900), pp. 519–520, fig. 92.

This series of five specimens, Nos. 18982, 23026–23029, agree in pertinent detail with the figure given by Cope (*loc. cit.*) of an Arizona specimen.

There are 14 or 16 longitudinal rows of enlarged dorsal scales, there being strong variation in the size of the outer row of scales. The number of dorsal dark bands varies from 10 to 13 (youngest specimen). This latter specimen (No. 18982) has the transverse dark bands with the white edge usually confined to a single row of scales, although medially the darker part may encroach on the preceding scale row; the four larger specimens have the dorsal blackish or blackish-brown bands usually covering two whole rows and often one or two half rows as well. On the sides the bands are usually confined to two scale rows, rarely covering the whole of them. The groove of the lateral fold is largely black, and some faint blackish spots are discernible immediately below the fold. The ground color above varies from olive-gray to gray, occasionally with a faint reddish brown shade discernible. The head is variously marked with black; the side of head below eye whitish or cream with some black spots. Below the color is lemon yellow on underside of abdomen and tail; chin, throat and breast cream. There are some minute grayish flecks, but there are no distinct dark spots on each scale as is true of Arizona specimens.

Cnemidophorus perplexus Baird and Girard.

A single specimen of the species (No. 29061) is present in the collection.

Eumeces callicephalus Bocourt.

Eumeces callicephalus Bocourt, Mission Scientifique au Mexique et dans l'Amérique Centrale; Rept., Liv. 6, 1879, pp. 431–433, pl. XXII D, figs. 2, 2 a, 2 b, 2 c, and pl. XXII E, fig. 2 (type description, type locality, Guanajuato, Mexico, Dugès col.); Taylor, Kansas Univ. Sci. Bull., XXIII, 1935 (1936), pp. 290–298, pl. 23, and text figs. 44, 45. (Diagnosis states the adpressed limbs do not touch. However, in medium sized males the toes may touch).

The single specimen No. 23019 in the collection agrees with the characters recorded by Taylor (*op. cit.*). The postnasal is present on both sides; there are seven upper labials (the postlabial scale is large, elongate and may be mistaken for an eighth labial); the black stripe on the side which continues to base of tail is on parts of three scale rows but not more than two scale rows wide; the light stripe on labials continues through the ear, and can be traced as a grayish silver line to the hind leg. Dorsal color greenish gray, somewhat browner anteriorly; chin and throat white; head lines join on the nuchals, of which there are two on one side and three on the other.

Eumeces parviauriculatus Taylor.

Eumeces parviauriculatus Taylor, Proc. Biol. Soc. Wash., XLVI, Oct. 26, 1933, pp. 178-181, fig. 2; Univ. Kansas Sci. Bull., 1935 (1936), pp. 368-371, plate 31, fig. 5; text figs. 59, 61.

Two specimens are referred to this species, No. 18984, certainly, and No. 18983 with some doubt, since the latter lacks the head.

The first specimen agrees with the type (figured *loc. cit.*) save that the frontonasal is larger and forms a very broad suture with the frontal; in consequence the prefrontals are distinctly smaller. Probably the most distinctive characters of the species is the very large anterior temporal, the still larger lower secondary temporal, which exceeds the upper secondary in size, and the consequent reduction in the size of the sixth and seventh labials. These characters are clearly defined in this specimen. There is an ear lobe distinguishable, which was not observed in the type. There are twenty scales about body; 68 scales from parietals to above anus; and 24 scales about constricted part of neck. The specimen, preserved in formalin, is grayish black, the dorsolateral white lines visible from the snout to the base of the tail. The black lateral stripe is distinct to above the hind leg. The lateral white stripe beginning on the anterior labials extends only to arm, passing through lower half of ear; the very short limbs when adpressed are separated by about 18 scales. The subcaudal scales are not or but very slightly larger than adjoining scales. The snout to vent length is 57 millimeters.

The headless specimen has a clear bluish-gray coloration above with a greenish-white dorsolateral line. The black stripe on side is about 3 scales wide on the neck but only about the width of two scales posteriorly. The tail is grayish blue above and below; neck creamy-white the belly grayish. The limbs adpressed are separated by 18 scales. The body is extremely slender, its greatest width being 4.6 mm. The distance between axilla and groin is 22 millimeters. The length of the tail is 61.4 millimeters. There are 20 scales around middle of body. Despite the absence of the head I have but little hesitancy in regarding it a young specimen of this species.

Conopsis nasus Günther.

Conopsis nasus Günther, Catalogue of Colubrine Snakes; London, 1858, pp. 5-6 (type locality "California" in error . . . Probably western Mexico). *Contia nasus* Boulenger, Cat. Snakes British Museum, II, 1894, pp. 268-269 (*part*). (In the lists of specimens, six, collected by M. Sallé, are designated as "Types" (obviously incorrectly).)

A single juvenile specimen No. 23018 agrees fairly well with the type description save that there is a small loreal present.

Both Günther and Boulenger confuse with this species certain other species of the genus, especially the *Oxyrhina varians* Jan. This latter form is variable and is widespread, occurring in Hidalgo, México, Veracruz, Tlaxcala, Puebla, Morelos, Distrito Federal, Guanajuato, Michoacán and Jalisco.

C. nasus is known from Michoacán, Jalisco, Guanajuato and Durango and overlaps the territory of *varians* in the southern part of its range. The two differ greatly in size and in dorsal and ventral coloration, and markings. I have seen only one specimen of *varians* (in more than 100 specimens), with the internasals and prefrontals fused—this a specimen from far out of the range of *nasus*. I have seen no specimen of *nasus* (with the median, dorsal, dark quadrangular spots, and with the dark quadrangular marks on the ventrals) that failed to have them fused (20 specimens).

The two forms may occur on the same hillsides in the same identical habitats (under rocks).

It is probable that with an accumulation of specimens, subspecific forms may profitably be separated in both species.

The specimen recorded here is the most northern record. Ventrals, 126; subcaudals, 34; such differences as obtain between this specimen and other specimens I have from other parts of Mexico, may be due to age (i. e., shorter, slightly less pointed snout).

Diadophis regalis arizonae Blanchard.

Diadophis regalis arizonae Blanchard, Occ. Papers Mus. Zool. Univ. Michigan, No. 142, July 9, 1923, p. 2.

Two specimens are referred to this subspecies. Nos. 18966 ♀, 23045 ♂. They have respectively the following counts and measurements (in mm.): Ventrals, 224, 211; subcaudals, 62, 64; upper labials, 8 (left) -7, 8-8; lower labials, 9-9, 8-8; preoculars, 2, 2; postoculars, 2, 2; total length, 530, 598; tail, 89, 108; width of head, 8, 9.5; length of head, 14.6, 17.

Elaphe chlorosoma Günther.

Coluber chlorosoma Günther, Biologia Centrali-Americana, Reptilia and Batrachia, Feb., 1894, pp. 115-116, pl. XLI).

A large female specimen (No. 23062) was collected at Moguarichic, Chihuahua. It was found dead and partly eaten, so that the continuity of the ventral scale series is broken. The squamation of the head is typical.

Thamnophis eques (Reuss).

Six specimens of this species have been collected. These are Nos. 18962, 18963 and 23063-23066.

They are typical in every way with specimens from Southeastern United States. The exact type locality is unknown, but the type is from Mexico.

Thamnophis multimaculata (Cope).

Atomarchus multimaculatus Cope, Amer. Nat. 1883, pp. 1300-1301.

This form, which Cope designated as the type of a new genus, has for a number of years been regarded as a synonym of *Thamnophis angustirostris* Kennicott. An examination of the type of the latter species shows this relationship does not exist.

The single specimen present, No. 23015, has a median postrostral scute

separating the nasals, and likewise separating the internasals from the rostral. This contains a deep circular pit; a pair of pits are present in the parietals. This is regarded as probably anomalous, since the presence or absence of the median postrostral varies. In a specimen in the National Museum the pit is present in a specimen from Arroyo del Alamas, 70-74 km. south of Nueva Casas Grandes, Chihuahua, México (No. 42874). The pit is present in the postrostral scale, but the pits are lacking in the parietals.

The general appearance of the snake is far more like *Natrix* than *Thamnophis*. It may be a *Natrix* with a fused anal.

Tantilla wilcoxi Stejneger.

Tantilla wilcoxi Stejneger, Proc. U. S. Nat. Mus., 25, 1902, p. 156 (type description; type locality Fort Huachuca, Arizona).

Four specimens of this rare species (Nos. 18967-18970, are in the collection, and are, I believe, the southernmost records. The following data apply to the above specimens respectively: ♂, ♀, ♀, ♀; ventrals, 155, 164, 159, 159; subcaudals, 62, ?, 67, 64; mental touches chinshields; narrowly on one side; narrowly on one side, broad contact with both, broad contact with both.

This data with that given by Blanchard (Zool. Series Field Mus. Nat. Hist., XX, No. 28, Apr. 20, 1938, pp. 369, 376) gives the following ranges of ventrals and subcaudals for males and females respectively: 149-155; 157-164; 62-69; 58-67.

Crotalus molossus molossus Baird and Girard.

Two specimens are in the collection, Nos. 18911, 23053.

Crotalus willardi Meek.

Two specimens have been collected, Nos. 18964, 18965.

Crotalus triseriatus pricei (Van Denburgh).

One specimen, No. 23013 is in the collection. The ventrals are 164; the subcaudals, 22, of which only the last is divided. The scale formula is 24 (about head) 21, 23, 17, 17. The deep black stripe behind the eye is bordered by a narrow cream line above, while below it is bordered by a white stripe beginning below eye and continuing to the angle of the mouth, involving the posterior upper labials. The median, paired black spots are very narrowly edged with gray white, and are but little larger than the spots which form the three lateral rows. Outer scale row and outer edge of ventrals edged with grayish white. Total length of body and tail to end of rattle 427 mm.; tail and rattle, 47 mm.; rattle, 15 mm.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

SIX NEW FORMS OF BIRDS FROM INDOCHINA

BY J. H. RILEY.¹

Dr. Joseph F. Rock has recently sent in to the U. S. National Museum a second consignment of birds from Indochina (South and Central Annam, Cochinchina, and Cambodia), containing a large number of additional forms to those previously sent and additional specimens to some of the races scantily represented in the former shipment. Among other things, he made special efforts to secure specimens of the Giant Ibis, *Thaumatibis gigantea*, in Cambodia, and in this was very successful. The following six forms apparently require separation and are named accordingly. I am indebted to the American Museum of Natural History, through Dr. Ernst Mayr, and the Academy of Natural Sciences of Philadelphia, through Mr. Rodolphe M. de Schauensee, for the loan of specimens used in comparison.

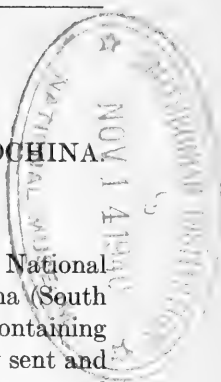
***Pericrocotus peregrinus sacerdos*, subsp. nov.**

Type.—Male, U. S. National Museum, No. 360,788, Sambor, Cambodia, January, 1940.

Similar to *Pericrocotus peregrinus vividus* Baker, but more deeply colored below, on the rump, and on the tips to the outer tail feathers; size slightly smaller. Wing, 70; tail, 67.5; culmen, 11.

Remarks.—This form is founded on three males from Cambodia and a pair from the Langbian Plateau, southern Annam. These have been compared with a good series from Siam and Tenasserim. The male from the Langbian Plateau is in a bleached post-breeding season plumage and is indistinguishable from Siamese males, but I am placing it with the Cambodian series on size. The three males from Cambodia and one male from South Annam measure: wing, 67.5-70.5 (69.4); tail, 67.5-68.5 (67.9); culmen, 10.5-11 (10.7). Ten males from Tenasserim (3) and Siam (7): wing, 67-75 (71.7); tail, 69-76 (72.6); culmen, 10.5-11 (10.8). The single female from the Langbian Plateau does not differ appreciably in color from the same sex from northern and central Siam, except in size, being somewhat smaller.

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Dicrurus leucophaeus rocki, subsp. nov.

Type.—Male, U. S. National Museum, No. 360,828, Arbré Broyé, South Annam, October, 1939.

Similar to *Dicrurus leucophaeus mouhoti*, but averaging slightly darker and considerably smaller in size. Also similar to *Dicrurus bondi* but darker and the black bristle-like feathers across the forehead well developed. Wing, 137; tail, 128; middle tail-feathers, 91; culmen, 22.

Remarks.—This form is founded upon seventeen specimens from the Langbian highlands of South Annam which have been compared with a good series of *Dicrurus leucophaeus mouhoti*, mostly from northern and southeastern Siam, and four specimens of *Dicrurus bondi* (including the type). The measurements of the three forms are as follows: Ten males from northern and southeastern Siam: wing, 138–143 (140); tail, 136–151 (142.8); middle tail-feathers, 93.5–107.5 (99.3); culmen, 22.5–24 (23.2). Eight males from South Annam: wing, 129.5–138 (134.6); tail, 118–135 (128.3); middle tail-feathers, 81–99 (91); culmen, 19.5–22 (20.9).

The three males of *Dicrurus bondi*: wing, 127–134 (131); tail 114.5–120 (118); middle tail-feathers, 86–94 (89.3); culmen, 20–21 (20.5).

Walden (Ann. & Mag. Nat. Hist., ser. 4, vol. 5, 1870, p. 220) described *Buchanga mouhoti* from Cambodia as darker than *B. leucophaea*, when the opposite is the case. I believe this type must have been an immature specimen. His measurement of the wing is too short and of the middle tail-feathers too long. As no specific type locality was given, I would definitely designate Angkor, Cambodia, as the type locality.

Named in honor of Dr. Joseph F. Rock, who has done so much for the botany and ornithology of the East.

Drymocataphus albiventer vicinus, subsp. nov.

Type.—Male, U. S. National Museum, No. 360,926, Fimnon, South Annam, November, 1939.

Similar to *Drymocataphus albiventer cinnamomeus*, but the throat is more extensively white, the hastate markings on the throat more pronounced and blackish rather than brownish; sides of face more grayish; color above and below, averaging lighter; culmen longer. Wing, 56; tail, 48; culmen, 14.

Remarks.—The present form is founded upon six specimens from the Langbian region of South Annam, but only a pair has been available for comparison of *Drymocataphus albiventer cinnamomeus*. While the two forms are separated widely geographically, they are remarkably alike in color.

Stachyridopsis ruficeps paganus, subsp. nov.

Type.—Male, U. S. National Museum, No. 360,911, Fimnon, South Annam, November, 1939.

Similar to *Stachyridopsis ruficeps davidi* from Szechwan, but a lighter, brighter yellow below; pileum lighter, more yellowish rufous; upperparts lighter, grayish olive, instead of citrine drab. Wing, 54; tail, 50.5; culmen, 13.

Remarks.—The present form is founded upon two males and two females

from the Langbian region of South Annam. These have been compared with nineteen specimens of *S. r. davidi* from Szechwan. The female is much lighter below than the male, olive buff, very lightly washed with chartreuse yellow, the throat with fine dusky streaks. It differs in the same way as the male in a lesser degree.

There is little or no difference in size between the two forms.

***Pycnonotus finlaysoni eous*, subsp. nov.**

Type.—Male, U. S. National Museum, No. 360,964, Col. des Nuages, Quinhon Road, Central Annam, January, 1940.

Similar to *Pycnonotus finlaysoni finlaysoni* from the Malay Peninsula, but the underparts grayer, the crissum and under tail-coverts averaging a deeper yellow; upperparts darker; closed wing outwardly a more greenish yellow. Wing, 78.5; tail, 73; culmen, 15.

Remarks.—Of the present form, the series consists of one male from the Langbian Plateau, three males from the type locality, two males and one unsexed from Cambodia. These have been compared with a good series from the Malay Peninsula and a large series from Siam. The specimens from the lower Malay Peninsula have a brownish tinge to the lowerparts, especially on the chest, rarely found further north in the upper part of the Peninsula. Specimens from eastern Siam grade towards the present form if they should not actually be placed with them. There is little or no difference in size between the two forms.

***Microscelis psaroides impar*, subsp. nov.**

Type.—Male, U. S. National Museum, No. 360,989, dense forests south of Dalat, South Annam, October, 1939.

Similar to *Microscelis psaroides concolor* but smaller and averaging lighter on the back. Wing, 121; tail, 98; culmen, 21.5.

Remarks.—This form is founded upon fourteen specimens from the mountains of South Annam and has been compared with thirty-seven specimens from Siam, six adults from Yunnan, three specimens from French Laos, and one specimen from Tonkin.

Ten males from northern Siam measure: wing, 125–134 (128); tail, 102–113 (106); culmen, 24–26 (24.8).

Seven males from South Annam: wing, 115.5–125 (121); tail, 89.5–105 (97); culmen, 21.5–24 (22.6).

The females are smaller than the males and the differences in this sex are not so great.

Ten females from northern Siam measure: wing, 116–123.5 (119.6); tail, 94–105 (98.7); culmen, 21–25 (22.7).

Seven females from South Annam: wing, 113.5–118 (115.6); tail, 88–97 (90); culmen, 21–23.5 (22.3).

Only four of the Yunnan specimens are sexed, three as males. They are slightly darker above than the northern Siamese series, but upon measurement agree with them. The differences, if there are any, are too slight to be recognized by name. The Laos and Tonkin specimens are in bad shape and not suitable for comparison, but they probably belong with the northern form.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONEIGHTH SUPPLEMENT TO THE FLORA OF THE
DISTRICT OF COLUMBIA AND VICINITY.

BY W. L. McATEE.

In view of plans for a manual of the flora¹ of a greatly enlarged region, including the area that has usually been adopted for publications on plants of the District of Columbia and vicinity, it seems desirable to summarize progress of knowledge since issuance of the Seventh Supplement² ten years ago. In the preparation of that publication and the present one, the writer has acted as a compiler only. He is not an expert botanist and owes much to the contributions of numerous individuals mentioned in the text. He is especially indebted to Neil Hotchkiss, F. J. Hermann, and S. F. Blake for critical comment as well as for notes on the flora. Doctors Hermann and Blake also have kindly gone over the manuscript and made numerous useful suggestions.

Bibliographical references to publications cited more briefly in the following pages are:

Bailey, L. H. *Gentes Herbarum*, I (5), Art. 6. *Rubus*: Enumeration of the Eubati (dewberries and blackberries) native in North America, pp. 203-297. 1925.

Bailey, L. H. *Gentes Herbarum*, II (6), Art. 12. The blackberries of North America, pp. 270-423. 1932.

Hitchcock, A. S., and Paul C. Standley (et al.). *Flora of the District of Columbia and vicinity*. *Contr. U. S. National Herbarium*, 21, 329 pp., 42 pls. 1919.

Cited as 1919 *Flora*.

Hotchkiss, Neil. *Flora of the Patuxent Research Refuge*,

¹In charge of a Committee with E. H. Walker of the Smithsonian Institution as Chairman.

²*Proc. Biol. Soc. Wash.* 43, pp. 21-54, 1930.

- Maryland. Biological Survey Wildlife Leaflet 154, 34 pp. (mimeographed), May, 1940.
- McAtee, W. L. Seventh supplement to the flora of the District of Columbia and vicinity. Proc. Biol. Soc. Wash., 43, pp. 21-54, March 12, 1930.
Cited as Seventh Supplement.
- Mackenzie, Kenneth K. North American Flora, Vol. 18 [Cariceae], 478 pp., New York Botanical Gardens, Pts. 1-3, 1931; Pts. 4-7, 1935.
- Norton, J. B. S. Maryland grasses. Univ. Md. Agr. Expt. Sta. Bul. 323, pp. 251-326, 6 pls., 1 fig. Sept. 1930.
- Pennell, Francis W. The Scrophulariaceae of Eastern Temperate North America. Acad. Nat. Sci. Phila. Monogr. 1, 650 pp., 155 figs. 1935.

The material collected for the present, or eighth, supplement is arranged under three headings, each of which may be understood to include the words: "in the regular series of publications on the District of Columbia flora."³

I. Species, hybrids, and varieties hitherto unrecorded.

II. Amendments to statements as to distribution of plants previously recorded.

III. Miscellaneous notes on plants previously recorded.

Section I includes references to descriptions of new forms based in part upon local material but not to apparent additions resulting from nomenclatorial changes. Many of the latter were collected but they have been omitted to conserve printing funds. Section III, however, includes references to changes in names in connection with which locally collected specimens were definitely cited.

In the case of each entry the number at the left refers to the pertinent page in the 1919 Flora. In a few cases adjacent reference is made also to the appropriate page of the Seventh Supplement.

³ 1881 and 1919 Floras and six supplements together with the Seventh Supplement in which full bibliographic references to others of the series are given.

I.

Species, hybrids, and varieties hitherto unrecorded. This section totals 85 species, 23 varieties, and 3 hybrids.

62. **Sparganium americanum androcladum** (Englm.) Fern. & Eames.
The plant so recorded in the 1919 Flora is merely a form of *americanum*. The genuine *S. androcladum* (Engelm.) Morong has been collected, however, on the Patuxent Research Refuge, Prince Georges County, Md., Oct. 15, 1937, N. Hotchkiss (Biol. Survey Wildlife leaflet 154, 1940, p. 11).
63. **Potamogeton friesii** Ruprecht.
Hunting Creek, Va., G. H. Shull (Fernald, M. L. Mem. Gray Herb., 3, 1932, p. 54).
63. **Potamogeton foliosus** Raf.
The variety *macellus* is described as new, in part from local material, by M. L. Fernald (Mem. Gray Herb., 3, 1932, pp. 46-51): Fish Pond, D. C., G. H. Shull; Chain Bridge, July 13, 1879, L. F. Ward; Flats of Potomac opposite Alexandria, G. H. Shull.
63. **Potamogeton heterophyllus** Schreb.
Belmont Bay, Va., June 30, 1930, F. M. Uhler.
64. **Naias guadelupensis** (Sprengel) Morong.
R. T. Clausen (Rhodora 38, p. 344, Oct. 1936) records this species from the District of Columbia.
66. **Elodea densa** (Planch.) Carp.
Ammendale, Md., Sept. 19, 1916, Brother F. Hyacinth (det. Harold St. John).
71. **Arthraxon hispidus** (Thunb.) Makino var. **cryptatherus** (Hackel) Honda.
Chain Bridge towpath, D. C., 1930, June Cooper; border of Four-mile Run at Mt. Vernon Boulevard, Alexandria, Va., 1937, N. Hotchkiss, F. J. Hermann; swampy southwest bank of Potomac River, $\frac{1}{8}$ mile north of Memorial Bridge, Arlington County, Va., Oct. 8, 1939, F. J. Hermann. Norton's record (1930, p. 313) of *A. ciliaris* Beauv. from Chevy Chase refers to this species.
72. **Andropogon elliottii** Chapm.
M. L. Fernald and Ludlow Griscom (Rhodora 37, p. 139, April, 1939) describe a new variety *projectus*, with the racemes on long peduncles, citing specimens from Riverdale, Md., Oct. 3, 1911, Holm; Chevy Chase, D. C., Sept. 24, 1922, Chase; and District of Columbia, Sept. 22, 1896, Steele.
73. **Eriochloa contracta** Hitchc.
A single plant collected in a new road near Glencarlyn, Arlington County, Va., Aug. 7, 1933, S. F. Blake. (Recorded in Rhodora 36, p. 420, Dec. 1934.)
74. **Paspalum repens** Berg.
Plummers Island, Md., E. P. Killip (Proc. Biol. Soc. Wash. 44, p. 112, Oct. 1931).

78. **Panicum lanuginosum** Ell.
Prince Georges County, Md. (Norton 1930, p. 305).
80. **Echinochloa**.
K. M. Wiegand (*Rhodora* 23, p. 57, March, 1921) recognizes *E. muricata* (Michx.) Fernald as distinct from *E. crusgalli* and records local specimens: B. & O. R. R. tracks, D. C., 1904, A. H. Moore; and Great Falls, Md., 1915, T. Holm.
80. **Setaria faberi** Herrm.
A small thriving colony at Arlington Farm, Va., near greenhouses in 1936. Spike-like panicles very drooping. According to Mrs. Agnes Chase, this species recorded from Missouri as a weed has been confused with *S. viridis*. Native of China and probably introduced with millet seed. H. A. Allard.
81. **Zizaniopsis miliacea** (Michx.) Doell. & Aschers.
Dogue Creek, Va., July 16, 1935, F. M. Uhler and C. Cottam. All of this rather pestiferous water plant seen was destroyed.
83. **Alopecurus pratensis** L.
Occurs as an escape in Prince Georges County, Md. (Norton, 1930, p. 284).
83. **Agrostis elliotiana** Schult.
Near Franconia, Fairfax County, Va., May 31, 1932, N. Hotchkiss and A. C. Martin; Aurora Hills, Arlington County, Va., May 31, 1936, N. Hotchkiss.
83. **Agrostis tenuis** Sibth. var. **aristata** (Parn.) Druce.
Eckington, D. C., 1903, A. S. Hitchcock. Also reported by Norton (1930, p. 283), from Montgomery County, Md., under the name *A. palustris* Huds. var. *aristata*.
83. **Agrostis stolonifera** L.
Prince Georges County, Md. (Norton, 1930, p. 283).
86. **Eragrostis hirsuta** (Michx.) Nees.
Collected by S. F. Blake (*Rhodora*, 36, p. 420, Dec. 1934) near Glencarlyn, Va., Aug. 7, 1933; a single clump was found in a new road.
87. **Eragrostis suaveolens** Becker.
"It has been cultivated as an ornamental and has become wild rarely in Prince Georges County," Md. (Norton, 1930, p. 272).
87. **Cynosurus cristatus** L.
"One specimen collected at College Park," Md. (Norton, 1930, p. 274).
88. **Glyceria melicaria** (Michx.) Hubb.
Recorded under the name *torreyana* Hitchc. from Prince Georges County, Md. (Norton, 1930, p. 267).
90. **Bromus arvensis** L.
Prince Georges County, Md. (Norton, 1930, p. 264).
90. **Bromus latiglumis** (Shear) Hitchc.
Recorded from Prince Georges and Montgomery Counties, Md. (Norton, 1930, p. 264). *B. incanus* (Shear) Hitchc., regarded by

Hitchcock (Manual of the Grasses, 1935, p. 45) as a form of the same species is also listed for Montgomery County.

90. **Bromus mollis** L.
Norton records *B. hordeaceus* L. from Prince Georges County, Md. (1930, p. 264) but Hitchcock (Manual of the Grasses, 1935, p. 50) refers American records of that European species to *B. mollis*.
90. **Lolium perenne** L. var. **cristatum** (Pers.) Doell.
Department of Agriculture Grounds, D. C., 1931, Mildred Pladeck.
91. **Aegilops ovata** L.
Mildred Pladeck (Rhodora 36, p. 408, Nov. 1934) records this species from Arlington Farm, Va.
91. **Elymus riparius** Wiegand.
Near Widewater, Montgomery County, Md., June 29, 1929, S. F. Blake; identified by J. R. Swallen. Montgomery and Prince Georges Counties, Md. (Norton, 1930, p. 277).
95. **Eleocharis capitata** (L.) R. Br.
H. K. Svenson (Rhodora 34, pp. 198–202, Oct. 1932), besides recording the typical variety from our region, lists var. *pseudoptera* Weatherby, n. var. from Four-mile Run, Va., A. S. Hitchcock 1905. Among comment is the remark that "this variety is easily recognized in the field." A key to the varieties of *E. capitata* is given on pages 198–199. In 1939 (Rhodora 41, p. 65) the same author restores the name *E. tenuis* (Willd.) Schultes for this species.
97. **Scirpus acutus** Muhl.
S. occidentalis (S. Wats.) Chase. Belmont Bay, Va., June 30, 1930, F. M. Uhler.
107. **Carex**.
K. K. Mackenzie (N. A. Flora, 18, 1931–35) records 100 species of *Carex* from the District of Columbia, 2 more than are formally listed in the 1919 Flora. His locality records being, as a rule, only to State, it is impossible to tell how many of the Maryland and Virginia citations pertain to the local flora. Eliminating species recorded as varieties or under other names, the following 6 are additional to those listed in the 1919 Flora and Seventh Supplement: *C. virens* Lam., *C. brachyglossa* Mack., *C. umbellata* Schkuhr, *C. haleana* Olney, *C. allegheniensis* Mack (*C. debilis* var. *pubera* Gray), and *C. hirta* L.
109. **Carex atlantica** Bailey.
Bowie, Md., June 7, 1938, N. Hotchkiss (det. F. J. Hermann). Probably the *C. cephalantha* Bickn. of the 1919 Flora. See Section III.
109. **Carex stipata** Muhl. var. **maxima** Chapm.
C. uberior (Mohr) Mack. Cropley, Montgomery County, Md., May 17, 1929, S. F. Blake. Identified by F. J. Hermann.
109. **Carex longii** Mackenzie.
Bowie, Md., June 7, 1938; Patuxent Research Refuge, Md., June 14, 1939, N. Hotchkiss. (Biol. Survey Wildlife Leaflet 154, 1940, p. 15.) *C. abolutescens* of the 1919 Flora in part.

109. **Carex tenera** Dewey.
Cropley, Montgomery County, Md., May 17, 1929, S. F. Blake. Identified by K. K. Mackenzie. *C. festucacea* Schkuhr. of the 1919 Flora, in part. See Section III.
111. **Carex digitalis** Willd.
M. L. Fernald (*Rhodora* 40, p. 400, Oct. 1938) describes a new variety *macropoda*, with "very long staminate peduncles," in part from local material: "damp rocky woods along the Potomac southeast of Great Falls," Md., June 11, 1904, Agnes Chase.
111. **Carex hirsutella** Mackenzie.
Patuxent Research Refuge, Md., July 1, 1937, N. Hotchkiss (det. F. J. Hermann). (*Biol. Survey Wildlife Leaflet* 154, 1940, p. 15.) Dry wooded slope, Great Falls, Va., July 4, 1938; dry oak ridge, Bailey's Crossroads, Fairfax County, Va., June 6, 1939, F. J. Hermann. *C. complanata* Torr. of the 1919 Flora in part. See Section III.
113. **Carex grayii** Carey.
Plummers Island, Md., May 29, 1933, E. P. Killip.
113. **Carex lupuliformis** Sartwell.
Patuxent Research Refuge, Md., Aug. 17, 1938, N. Hotchkiss (det. F. J. Hermann). (*Biol. Survey Wildlife Leaflet* 154, 1940, p. 15.)
118. **Juncus longii** Fernald.
Described as new by M. L. Fernald (*Rhodora* 39, p. 397, Oct. 1937) from southeastern Virginia is recorded also from the vicinity of Washington, D. C. (Lester F. Ward, Aug. 5, 1877).
118. **Juncus coriaceus** Mack.
J. setaceus Auctt. Picnic ground, Great Falls, Va., Aug. 2, 1931, S. F. Blake.
126. **Iris prismatica** Pursh.
A strong colony near Great Falls, Va., June 6, 1935, H. S. Barber.
139. **Quercus imbricaria** X **marilandica**.
Near head of Pimmit Run, Va., H. A. Allard (*Bull Torrey Bot. Club*, 59 (5), May, 1932, p. 273).
139. **Quercus phellos** X **marilandica**.
Q. rudkini Britt. Lyon Park, Va., H. A. Allard (*Bul. Torrey Bot. Club*, 59 (5), May 1932, p. 270).
139. **Quercus phellos** X **palustris**.
Pershing Drive just east of Glebe Road, Arlington County, Va., H. A. Allard (*Bul. Torrey Bot. Club*, 59 (5), May, 1932, p. 273).
143. **Pilea fontana** Lunell.
Abundant in wet land, Glencarlyn, Arlington County, Va., Oct. 6, 1894, L. H. Dewey (det. F. J. Hermann).
143. **Boehmeria cylindrica** var. **drummondiana** Weddel.
Potomac Flats at Chain Bridge, D. C., Aug. 13, 1938; low field on U. S. Highway 50, east of Merrifield, Fairfax County, Va., Sept. 22, 1939, F. J. Hermann.

145. **Polygonum caespitosum** Blume var. **longisetum** (De Bruyn) A. N. Steward.
S. F. Blake states (Rhodora 34, pp. 146-147, July 1932) "On 1 Nov. 1931, I found two thriving colonies of the plant in Washington, D. C., the first on the bank of a brook along Klinge Road nearly under the Connecticut Avenue bridge." The second was in the National Zoological Park; also found on the mainland near Plummers Island, Md., Oct. 10, 1935, S. F. Blake.
146. **Polygonum sachalinense** F. Schmidt.
Several bushes in bloom on railroad embankment just south of the Potomac (in Virginia), Aug. 30, 1932; also in Rock Creek Valley, near P St., 1933; W. L. McAtee.
152. **Holosteum umbellatum** L.
Near Ballston, Arlington County, Va., April 23, 1939, R. F. Martin.
155. **Tunica saxifraga** (L.) Scop.
Brookland, D. C., Titus Ulke.
158. **Ranunculus hederaceus** L.
W. B. Drew (Rhodora 38, p. 13, Jan. 1936) records this species from the Patuxent River south of the mouth of its western branch, Prince Georges County, Md. Separate collections by Shreve and Morris are listed. Morris recorded his find in the Proceedings of the Biological Society of Washington xiii, pp. 157-158, 1900, but as the plant has not been included in publications on the D. C. flora, the locality must have been considered outside of the accepted limits. It is, however, within a 20-mile radius, so this record for a plant of a subgenus otherwise unrepresented in the local flora may well be recognized.
167. **Thlaspi perfoliatum** L.
Waste ground on embankment bordering canal, Great Falls, Montgomery Co., Md., April 14, 1939, F. J. Hermann.
168. **Arabis lyrata** L.
Milton Hopkins (Rhodora 39, p. 91, March, 1937) describes a new form *parvisiliqua* of which he records a specimen from the District of Columbia collected by E. L. Morris.
175. **Rubus centralis** Bailey.
Described in part from local material (Mount Vernon, Va.) (Bailey, 1932, pp. 330-331). Collected also on the Patuxent Research Refuge, Md., by N. Hotchkiss (Biol. Survey Wildlife Leaflet 154, 1940, p. 23).
175. **Rubus louisianus** Berger.
Good-sized colony, Glebe Road, Clarendon, Arlington County, Va., July 13-18, 1932, S. F. Blake. Identified by L. H. Bailey.
175. **Rubus ostryifolius** Rydb.
Rosslyn, Va. (Bailey, 1925, p. 282). Collected also on the Patuxent Research Refuge, Md., by N. Hotchkiss (Biol. Survey Wildlife Leaflet 154, 1940, p. 23).
175. **Rubus rhodophyllus** Rydb.
Recorded from several stations about Washington, D. C. (Bailey, 1925, p. 269); also District of Columbia (Bailey, 1932, p. 407).

175. **Rubus rosarius** Bailey.

Described from material collected near Riverdale, Md. (Bailey, 1925, p. 268); recorded from Prince Georges County, Md., original station now destroyed (Bailey, 1932, p. 409).

175. **Rubus ulmifolius** Schott.

Well established in vacant lot, Virginia Highlands, Arlington County, Va., June-July, 1940, F. R. Fosberg.

175. **Rubus vigil** Bailey⁴.

Described from material collected about 55th St. N. E., D. C., (Bailey, 1925, p. 251). Recorded from Washington, D. C. (Bailey, 1932, p. 345).

180. **Leptoglottis nuttallii** DC.

"R. F. Griggs showed specimens of a sensitive plant . . . new to the flora of Washington" (Proc. Bot. Soc. Wash., Nov. 4, 1936. Journ. Wash. Acad. Sci. 27 (1), Jan. 1937, p. 42).

180. **Cercis canadensis** L.

M. L. Fernald (Rhodora 38, p. 234, June, 1936) describes the new form *glabrifolia*, citing as typical, material collected near Washington, D. C., April 20 and May 15, 1896, by E. S. Steele.

182. **Baptisia tinctoria** (L.) Kent.

Variety *crebra* Fern., of coarser habit, is recorded from several localities in and near the District of Columbia by Mary L. Larisey in her monograph of the genus (Ann. Mo. Bot. Gard., 27 (2), April 1940, p. 187).

184. **Trifolium resupinatum** L.

Found as a weed in lawns in 1932; Washington, D. C., Cloyd H. Marvin, Jr., A. C. Martin, W. L. McAtee; Lincolnia, Va., A. C. Martin.

188. **Lespedeza cuneata** G. Don.

L. sericea Miq. not Benth. Abundant along gravelly embankment of Lee Boulevard at North Meade St., Arlington County, Va., Nov. 11, 1938, F. J. Hermann.

188. **Lespedeza procumbens** Michx.

S. F. Blake (Rhodora 26, pp. 26-27, figs. 1-2, Feb. 1924) describes var. *elliptica* var. nov. in part from material collected in a dry meadow near Lorton, Va., Sept. and Oct., 1923.

188. **Lespedeza stipulacea** Maxim.

Plummers Island, Md., Sept. 19, 1937, E. P. Killip. P. L. Ricker states that this species is becoming established at several places in the region.

194. **Polygala verticillata** L.

A race with smaller floral parts and fruits from a range including the District of Columbia is described by M. L. Fernald (Rhodora 40,

⁴ While recording the conclusions of these later botanists, let us not forget the pioneer work of E. S. Steele who understood the diversity in species of *Rubus* before other Washington botanists were prepared to accept it. In 1930 he wrote to me of Bailey's two new species from near Washington. "I had already named both of these in ms."

pp. 334–335, Sept. 1938) under the name *isocycla* var. nov. Francis W. Pennell (Rhodora 41, pp. 378–384, Aug. 1939) considers that this is the typical form entitled to the name *verticillata*.

197. **Callitriche stagnalis** Scop.

Marsh near mouth of Sligo Creek, Md., May 27, 1915, Paul C. Standley (det. Neil Hotchkiss).

198. **Toxicodendron quercifolia** (Michx.) Greene.

Recorded from Georgetown, D. C., May 28, 1859, Schott; and near Terra Cotta, D. C., May 10, 1911, Holm, by Fred A. Barkley (Ann. Mo. Bot. Gard., 24 (3), 1937, p. 422). Also collected at Oakcrest, Arlington County, Va., June 5, 1938, by N. Hotchkiss.

198. **Toxicodendron radicans** (L.) Kuntze.

Variety *littoralis* (Mearns) Barkl. is recorded from "northeast of Washington," D. C., July 27, 1893, Boettcher, by Fred A. Barkley (Ann. Mo. Bot. Gard., 24 (3), 1937, p. 434).

204. **Hibiscus trionum** L.

Aurora Hills, Va., Oct. 12, 1931, N. Hotchkiss; The Mall, south of the New National Museum, Oct. 16, 1936, Agnes Chase.

205. **Hypericum petiolatum** Walt.

Patuxent Research Refuge, Md., June 24, Aug. 17, 1938, N. Hotchkiss (Biol. Survey Wildlife Leaflet 154, 1940, p. 26).

205. **Helianthemum bicknellii** Fern.

Patuxent Research Refuge, Md., Sept. 29, 1937, N. Hotchkiss (Biol. Survey Wildlife Leaflet 154, 1940, p. 26).

208. **Viola canadensis** L.

Dead Run, Va., May, 1899, Wm. Palmer; Great Falls, Va., April, 1933, V. Wismer (Patterson, P. M., Flora of Virginia, Violaceae, 1939, p. 10; mimeographed).

225. **Vaccinium serum** Ashe.

W. W. Ashe (Rhodora 33, pp. 194–195, Sept. 1931) in describing this form states that it is "Common along the Potomac River, in both Maryland and Virginia at Great Falls and extending into the District of Columbia, often on rock bars where it grows with *Amelanchier sera* Ashe and *A. oblongifolia* Roem., or in rocky woods, where many collections have been made since 1916. The type, both flowers and fruit from the same plant, Great Falls, Virginia, near Elkins station; flowers May 3, 1918; fruit June 23, 1918, W. W. A."

He also describes a pubescent variety, *V. serum* var. *pubifolium* var. nov., with types from Great Falls, Va., May 4, and June 23, 1918.

225. **Vaccinium vacillans** Sol. var. **columbianum** Ashe.

This plant with "Leaves glabrous, larger than in the type, thicker, with the veins prominent beneath and usually red" is described by Ashe (Rhodora 33, pp. 194–195, Sept. 1931) from "Below Great Falls, Virginia, April 28 and June 23 1919." He adds that "This variety is very common along the Potomac River growing with the type form in Maryland, Virginia and District of Columbia."

226. **Trientalis borealis** Raf.
Rock Creek Park, D. C., June, 1939, A. V. Smith.
230. **Apocynum cannabinum** L.
Variety *glaberrimum* DC. is recorded from Maryland and District of Columbia stations by Robert E. Woodson, Jr. (Ann. Mo. Bot. Gard., 17 (1-2), 1930, p. 129).
239. **Lippia lanceolata** var. **recognita** Fern. & Grise.
Potomac Flats at Chain Bridge, D. C., Aug. 13, 1938, F. J. Hermann.
246. **Mentha pulegium** L.
College Park, Md., July 16, 1932, J. B. S. Norton.
249. **Verbascum phlomoides** L.
Plummers Island, Md., June 26, 1938, E. P. Killip; along Baltimore and Ohio Railroad and Chesapeake and Ohio Canal between Chain Bridge and Georgetown, D. C., July 19, 1938, R. F. Griggs.
250. **Penstemon calycosus** Small.
Recorded by Pennell from Woodley Park, D. C., Steele (Scroph. 1935, p. 215).
250. **Penstemon canescens** Britton.
The typical variety recorded from island opposite Great Falls, Md., Williamson, by Pennell (Scroph., 1935, p. 222).
250. **Penstemon pallidus** Small.
Recorded by Pennell from Glen Echo, Md., V. Wismer; and Takoma Park, D. C., Steele (Scroph., 1935, p. 224).
251. **Gratiola lutea** Raf.
"Second Lock, Montgomery"; presumably from our region (Pennell, Scroph. 1935, p. 74). This provides a record for *G. aurea* Muhl., a synonym, no specimens reported seen in 1919 Flora.
- 251 **Hysanthes dubia** (L.) Barnhart.
The subspecies *Lindernia dubia major* (Pursh) Pennell is recorded from several local stations by Pennell (Scroph. 1935, p. 149); Plummers Island and Marlboro, Md.; Bennings, D. C.; Hunting Creek and Hemlock Bluff, Va.; also *Lindernia dubia major* var. *inundata* Pennell from Hunting Creek, Va., Dowell (op. cit. p. 152). See also Supplement 7, p. 33.
252. **Veronica glandifera** Pennell.
Recorded by its describer from Carberry Meadows, D. C., F. W. Layton (Scroph. 1935, p. 364).
254. **Melampyrum lineare** Lam.
Local plants are assigned to two subspecies by Pennell (Scroph. 1935, pp. 514, 516) as follows: *latifolium* (Muhl.) Beauverd, Beltsville, Md., McAtee; Washington, D. C., Ward; and *pectinatum* Pennell, Silver Spring, Md., Topping; Beltsville, Md., Hitchcock; and Takoma Park, D. C., Williams.
254. **Castilleja coccinea** (L.) Spreng.
Recorded from "Big Falls," Fairfax County, Va., Schott by Pennell (Scroph. 1935, p. 538). Doubtless the locality is Great

Falls, where so many plants, chiefly Alleghenian in this latitude, have been collected.

255. **Utricularia geminiscapa** Benj.
Patuxent Research Refuge, Md., July 28, Oct. 1, 1938, N. Hotchkiss (Biol. Survey Wildlife Leaflet 154, 1940, p. 31).
258. **Galium erectum** Huds.
Springy bank on roadside, Dempsey's Boat House, K St. N. W. Georgetown, May 18, 1939, F. J. Hermann. First record south of Connecticut.
262. **Valerianella intermedia** Dyal.
Sarah C. Dyal (Rhodora 40, pp. 202-204, May, 1938) recorded this new species from "low thickets near Great Falls of the Potomac, rare, May 10, 1899, Holm."
264. **Leontodon nudicaulis** (L.) Banks.
Smithsonian Grounds, D. C., July 6, 1937, W. R. Maxon.
265. **Pyrrophappus carolinianus** (Walt.) DC.
Four-mile Run, Va., July 31, 1938, N. Hotchkiss (det. S. F. Blake).
265. **Sonchus arvensis** L. var. **glabrescens** Guenth., Grab., & Wimm.
Along railroad, Ballston, Arlington County, Va., Sept. 21, 1939, S. F. Blake.
266. **Lactuca hirsuta** Muhl. forma **calvifolia** Fernald.
Annandale, Fairfax County, Va., June 29, 1932, S. F. Blake.
267. **Hieracium florentinum** All.
Several small colonies near together, Clarendon, Arlington County, Va., May 28, 1933, S. F. Blake.
267. **Hieracium pratense** Tausch.
Roadside about a mile below Great Falls, Va., June 4, 1933, S. F. Blake.
267. **Crepis tectorum** L.
A single plant, waste ground near Lincoln Memorial, June 10, 1933, S. F. Blake.
268. **Ambrosia bidentata** Michx.
Mildred Pladeck (Rhodora 36, p. 408, Nov. 1934) records this species from near Lanham, Prince Georges County, Md.
274. **Eupatorium album** L.
M. L. Fernald (Rhodora 39, pp. 451-453, Nov. 1937) divides this species into 4 varieties; his text or maps indicate that 3 of them grow in our region. Two are definitely recorded: the typical variety (District of Columbia) and var. *monardifolium* nov. (between Muirkirk and Contee, Md., Sept. 5, 1910, A. H. Moore; and near Chillum, Md., Sept. 24, 1926, S. F. Blake).
278. **Solidago canadensis** L.
Mildred Pladeck (Rhodora 36, p. 408, Nov. 1934) records var. *hargeri* Fernald from Widewater, Montgomery County, Md.
284. **Antennaria neglecta** Greene var. **solitaria** Peck.
Single clump near Ballston, Arlington County, Va., April 26, 1934, S. F. Blake.

288. **Madia sativa** Molina.
Linden, Md., June 1930, J. E. Benedict, Jr.; Dept. of Agriculture Grounds, D. C., July 19, 1933, O. M. Freeman and S. F. Blake.
290. **Matricaria matricarioides** (Less.) Porter.
Near railroad station, Vienna, Va., 1932 (?), Titus Ulke; Arlington Farm, Va., June 2, 1933, Mildred Pladeck.

II.

Amendments to statements as to range of plants previously recorded. This section totals 34 species and 2 varieties.

71. **Erianthus giganteus** Wait.
E. saccharoides Michx. Abundant in a meadow near Merrifield and Fairfax, Va., where in a nearly pure stand. H. A. Allard.
71. **Miscanthus sinensis** Anderss.
Prince Georges County, Md. (Norton, 1935, p. 311); very abundant in old fields near Barcroft, Arlington County, and near Merrifield, Fairfax County, Virginia, becoming a part of the early successions until crowded out by encroaching woodland. H. A. Allard.
72. **Andropogon ternarius** Michx.
Collington, Prince Georges County, Md., A. V. Smith; College Park, Md., J. B. S. Norton. Reinstatement of a species recorded by Ward (1881 Flora, p. 136) as *A. argenteus* Ell.
71. **Erianthus saccharoides** Michx.
Prince Georges County, Md. (Norton, 1935, p. 311).
74. **Paspalum setaceum** Michx.
Prince Georges County, Md. (Norton, 1930, p. 296).
77. **Panicum longifolium** Torr.
M. L. Fernald (Rhodora 36, p. 72, March, 1934) records that Holm collected a specimen at Clinton, Md., a locality not "in the valley of Eastern Branch," as specified in the 1919 Flora.
78. **Panicum clutei** Nash.
Prince Georges County, Md. (Norton, 1930, p. 303).
78. **Panicum pseudopubescens** Nash.
Prince Georges County, Md. (Norton, 1930, p. 305).
84. **Sphenopholis obtusata** (Michx.) Scribn.
Prince Georges County, Md. (Norton, 1930, p. 279).
90. **Bromus unioloides** (Willd.) H. B. K.
Occurs in Prince Georges County, Md. (Norton, 1930, p. 263).
90. **Lolium multiflorum** Lam.
Montgomery and Prince Georges Counties, Md. (Norton, 1930, p. 278); Clarendon, Va., June 25, 1937, H. A. Allard. Hitchcock (Manual of the Grasses, 1935, p. 272) says "Scarcely more than a variety of *L. perenne*."
91. **Hordeum pusillum** Nutt.
Montgomery and Prince Georges Counties, Md. (Norton, 1930, p. 277).

91. **Elymus canadensis** L.
Frequent, Montgomery and Prince Georges Counties, Md. (Norton, 1930, p. 276).
96. **Eleocharis engelmanni** Steud.
"District of Columbia near Deanwood, C. F. Wheeler in 1905; vic. of Washington, E. S. Steele in 1897" (Svenson, H. K., *Rhodora* 31, p. 208, Oct. 1929). Deanewood (near Benning) is east, not "south of Washington," the range specified in the 1919 Flora.
96. **Eleocharis olivacea** Torr.
"Clinton, Md., Holm in 1922" (Svenson, H. K., *Rhodora* 31, p. 232, Nov. 1929) is a locality in quite a different quarter from those cited in the 1919 Flora.
113. **Carex buxbaumii** Wahl.
The District of Columbia citation by Mackenzie (1935, p. 375) supplies the definite record, need for which was expressed in the 1919 Flora.
114. **Wolffia columbiana** Karst.
Shaw's Lily Ponds, D. C., Aug. 4, 5, 1929, S. F. Blake.
115. **Eriocaulon parkeri** Robinson.
Head of Dogue Creek estuary, 2 miles southwest of Mt. Vernon, Va., Sept. 17, 1939, F. R. Fosberg and R. McVaugh.
126. **Iris pseudacorus** L.
Traced at its blooming season, when easily seen, from just below Memorial Bridge, D. C., to below Fort Hunt, Va., May 27, 1933, W. L. McAtee.
155. (Suppl. 7, p. 26.) **Nelumbo lutea** (Willd.) Pers.
Belmont Bay, Va., June 30, 1930, F. M. Uhler.
155. **Cabomba caroliniana** A. Gray.
Head of Dogue Creek estuary, 2 miles southwest of Mt. Vernon, Va., Sept. 17, 1939, F. R. Fosberg and R. McVaugh.
158. **Ranunculus pusillus** Poir.
In ditch, Great Falls, Va., June 4, 1933, S. F. Blake.
175. **Rubus frondosus** Bigel.
District of Columbia (Bailey, 1932, p. 402).
191. **Xanthoxalis grandis** Small.
The 1919 Flora states "known definitely only from Plummers Island." K. M. Wiegand (*Rhodora* 27, p. 136, Aug. 1925) gives a record from District of Columbia, 1897, E. S. Steele.
197. **Callitriche palustris** L.
Not so prevalent as supposed; a definite record is Notley Hall, Md., 1894, F. V. Coville (N. Hotchkiss).
198. **Callitriche autumnalis** L.
The specimen so recorded in 1919 Flora is *C. heterophylla* Pursh, which is the most common representative of the genus, occurring on both the Piedmont and Coastal Plain. N. Hotchkiss.
236. **Phacelia ranunculacea** (Nutt.) Constance.
P. covillei S. Wats. Spontaneous in shrubby thickets, Clarendon, Va., where it has persisted in large colonies for 10 years or more. H. A. Allard.

250. (Suppl. 7, p. 33.) **Chelone obliqua** L.
Halls Bridge, near Drury, Prince Georges County, Md., Wherry and Pennell (Pennell, Scroph., 1935, p. 183).
251. **Gratiola viscosa** Schwein.
Renamed *G. viscidula* by Pennell because preoccupied. He records (Scroph., 1935, p. 80) the typical form from Clinton (Holm), a locality outside the valleys specified in the 1919 Flora.
252. **Veronica scutellata** L.
Recorded by Pennell from Alexandria, Va. (Scroph., 1935, p. 374), a locality not "along the upper Potomac" as stipulated in the 1919 Flora.
257. **Sherardia arvensis** L.
Smithsonian Grounds, D. C., May 30, 1938, W. R. Maxon.
258. **Galium verum** L.
Brookland, D. C., June 19, 1932, Titus Ulke.
264. **Hypochaeris radicata** L.
On new lawn, Department of Agriculture Grounds, D. C., June 13, 14, 1933; less common than in 1932 at the same spot. S. F. Blake.
267. **Crepis capillaris** (L.) Wallr.
Common in mowing field, Soldiers Home, D. C., June 14, 1924; also single plant, Department of Agriculture Grounds, D. C., June 8, 1933, S. F. Blake.
282. (Suppl. 7, p. 34.) **Aster pilosus** Willd. var. **platyphyllus** (T. & G.) Blake.
Plummers Island, Md., Oct. 20, 1936, S. F. Blake. Recorded in Suppl. 7 as *A. ericoides* L. var. *platyphyllus*.
291. (Suppl. 7, p. 46.) **Senecio obovatus** Muhl.
Mainland near Plummers' Island, Md., May 5, 1935, S. F. Blake.

III.

Miscellaneous notes on plants previously recorded. This section totals 37 species, 17 varieties, and 1 hybrid.

52. **Ophioglossum vulgatum** L.
M. L. Fernald (Rhodora 41, p. 494, Oct. 1939) describes as new the variety *pyncostichum* in part from local material: Woodside, Montgomery County, Md., June 13, 1897, C. L. Pollard; and ravines near Dupont Heights, D. C., July 22, 1905, Tidestrom. Typical *O. vulgatum* is Eurasian.
53. (Suppl. 8, p. 47). **Lygodium palmatum** (Bernh.) Swartz.
In November, 1930, M. A. Stewart reported that although as stated in the Seventh Supplement, the climbing fern near East Riverdale apparently suffered serious reduction, "it is now found to have reappeared in considerable quantity."
57. **Filix fragilis** (L.) Underw.
In revising the eastern North American representatives of this species, C. A. Weatherby (Rhodora 37, pp. 373-374) describes a new

variety under the name *Cystopteris fragilis* (L.) Bernh. var. *protrusa* that includes the plants of our region. Specimens recorded are from near Cabin John, Md., Aug. 1, 1920, Maxon; and High Island, D. C. (should be Maryland), June 23, 1897, Holm.

63. **Potamogeton panormitanus** Biv. var. **major** Fischer.

This form confused in the past with *P. pusillus* includes most of the local material assigned to that species (M. L. Fernald, Mem. Gray Herb. 3, 1932, p. 61). This author lists the following local collections: Flats of Potomac River opposite Alexandria, G. H. Shull; Hunting Creek, Va., McAtee; Dyke, Va., Metcalf and Sperry.

63. **Potamogeton epihydrus** Raf.

Two varieties are recognized by M. L. Fernald (Mem. Gray Herb., 3, 1932, pp. 113-123), of which var. *nuttallii* (Chamisso & Schlechtendal) Fern. is recorded from Maryland and Virginia localities near the District of Columbia.

63. **Potamogeton zosteræifolius** Schumacher.

This is a European species from which the American is distinct. The latter is described as *P. zosteriformis* n. sp., in part from local material by M. L. Fernald (Mem. Gray Herb. 3, 1932, pp. 36-40): Hunting Creek, Va., Shull, McAtee; Dyke, Va., Metcalf and Sperry.

66. **Anacharis canadensis** (Michx.) Babingt.

Harold St. John, revising New England representatives of this group (*Rhodora* 22, pp. 17-29, Feb. 1920), applies the name *Elodea occidentalis* (Pursh) to the form occurring here and records a specimen collected in the District of Columbia by Ward, June 11, 1882.

77. **Panicum dichotomiflorum** Michx.

M. L. Fernald (*Rhodora* 38, pp. 387-390, Nov. 1936) mentions 4 varieties of this species from the United States of which 2 are recorded from the District of Columbia. They have considerably overlapping ranges, the typical variety occurring in purest form to the northward and westward, and the other, *geniculatum* (Wood) Fernald, to the south and east.

79. (Suppl. 7, p. 47.) **Panicum scoparium** Lam.

A. S. Hitchcock says, in a letter of March 15, 1930, that although following usage at the time, Scribner was in error in using this name, the grass he collected at Great Falls being that now called *P. scribnerianum* Nash.

93. **Cyperus microdontus** Torr.

According to Hugh O'Neill (*Rhodora* 42, pp. 84-86, March, 1940) this plant should be known as *Cyperus polystachyos* Rottb. var. *texensis* (Torr.) Fern. He records a specimen from the District of Columbia, 1896, Steele.

93. **Cyperus diandrus** Torr.

Hugh O'Neill, who has recently made a monographic study of the genus *Cyperus*, reports that all the material from the District of Columbia determined as *C. diandrus* that he has seen represents *C. rivularis* Kunth.

95. *Eleocharis acuminata* (Muhl.) Nees.

This name is considered unidentifiable by H. K. Svenson (*Rhodora* 34, pp. 215-217, Nov. 1932) who uses for our plant the designation *Eleocharis compressa* Sull., citing specimens from Montgomery County, Md., and the District of Columbia.

96. *Eleocharis flaccida* (Reichenb.) Urban.

Specimens from Hunting Creek (S. F. Blake 11,086), referable to this species as treated in the 1919 Flora and collected at the only locality given for that species in the Flora, were identified as *E. olivacea* by H. K. Svenson, who states (*Rhodora* 31, p. 236, Nov. 1929) that he has seen no undoubted specimens of *E. flaccida* from north of Georgia.

107. *Carex*.

In Mackenzie's treatment (*N. A. Flora* 18, 1931-35) of the genus, names different from those given in the 1919 Flora are used for the following species for which District of Columbia occurrence is cited:

MACKENZIE	PAGE	1919 FLORA	NUMBER
<i>C. radiata</i> (Wahl.) Dewey..	46	<i>C. rosea radiata</i> Boott.....	3
" <i>spicata</i> Huds.....	54	" <i>muricata</i> L.....	4
" <i>plana</i> Mack.....	56	" <i>muhlenbergii enervis</i> Boott	5
" <i>seorsa</i> Howe.....	102	" <i>rosaeoides</i> Howe.....	19
" <i>atlantica</i> Bailey.....	107	" <i>cephalantha</i> Bickn.....	20
" <i>tenera</i> Dewey.....	148	" <i>festucea</i> Schkuhr.....	30
		(in part)	
" <i>richii</i> (Fern.) Mack.....	160	" <i>hormathodes</i> Fern.....	53
" <i>artitecta</i> Mack.....	189	" <i>varia</i> Muhl.....	46
" <i>albicans</i> Willd.....	190	" <i>emmonsii</i> Dewey.....	46
" <i>woodii</i> Dewey.....	239	" <i>tetanica woodii</i> Olney.....	61
" <i>gracilescens</i> Steud.....	259	" <i>laxiflora intermedia</i> Bailey	75
" <i>hirsutella</i> Mack.....	324	" <i>triceps hirsuta</i> Bailey.....	54

F. J. Hermann contributes the following remarks on two species of the preceding list:

C. plana Mack.

Since intermediates between this and *C. muhlenbergii* are frequent, I believe it is better kept as *C. muhlenbergii* var. *enervis* Boott.

C. albicans Willd.

H. K. Svenson has recently shown that this name is untenable (*Rhodora* 40, pp. 330-331, 1938). *C. emmonsii* Dewey, the term used for it in the 1919 Flora, seems to be the earliest available appellation.

109. *Carex angustior* Mack.

The basis of this record, both in the 1919 D. C. Flora and in *N. A. Flora* 18 : 113, is a collection in the District Herbarium by Standley (No. 11,751) from Paint Branch swamp which was so named by Mackenzie. The collection, however, represents a form of *C. howei* Mack, in which the perigynia are unusually narrow. *C. angustior* is a

northern species, occurring south of Connecticut only in the mountains. F. J. Hermann.

109. **Carex projecta** Mack.

The only specimen in the District Herbarium under this name is a collection of *C. scoparia* Schkuhr. This is apparently the basis of the reports here and in N. A. Flora 28 : 166. On account of its northern range, *C. projecta* is not likely to occur in the District of Columbia region. F. J. Hermann.

110. **Carex gynandra** Schwein.

C. A. Weatherby (Rhodora 25, p. 18, Feb. 1923) treats this as a variety of *C. crinita* and records a specimen from Takoma Park, D. C., May 17, 1903, J. H. Painter.

118. **Juncus marginatus** Rostk.

The name *Juncus coriaceus* Mackenzie (Bul. Torrey Club, 56, pp. 27-28, Jan. 1929) applies to the plant that has been passing as *J. setaceus* rather than to *J. marginatus*. F. J. Hermann. See also Section I.

119. **Juncoides campestre bulbosum** (A. Wood) Coville & Blake.

Theo. Holm (Rhodora 28, pp. 134-138, Aug. 1926) considers *Luzula multiflora* (Erh.) Lej. as a species distinct from *L. campestris* DC, and says it is "very frequent in the vicinity of Washington, D. C." Basing comment on his studies reported in Rhodora 40 : 83-86, 1938, F. J. Hermann says, "The commoner D. C. form is *Luzula echinata* (Small) Herman and the less frequent form is *L. multiflora* (Ehrh.) Lejeune, var. *bulbosa* (Wood) Hermann.

120. **Stenanthium robustum** S. Wats.

Thriving colony in a meadow at Merrifield, Va., Fairfax County. H. A. Allard, 1937. This form was recorded in Ward's Flora 1881 and there is difference of opinion as to its validity (see Gray's Manual, 7th Ed., 1908, p. 284).

139. **Quercus heterophylla** Michx.

This hybrid, ascribed to crosses of various species, is said by H. A. Allard (Bul. Torrey Bot. Club, 59 (5), May, 1932, p. 276), agreeing with D. T. MacDougal (Bot. Gaz. 43, 1907, pp. 45-58), to have the parentage *phellos* X *maxima* (i. e. *rubra*) not *phellos* X *velutina* as recorded in the 1919 Flora.

140. **Quercus ilicifolia** Wang.

The 1919 Flora notes "possibly not reaching our limits," but the species occurs in sandy land between the Baltimore Boulevard and Little Paint Branch near Ulle's Crossing, Md. Not far outside of our limits at Odenton, Md., it is common. W. L. McAtee.

154. **Silene caroliniana** Walt.

Robert T. Clausen (Rhodora 41, pp. 575-584, Dec. 1939) assembles with this form two other plants usually accepted as species and treats them as subspecies. The local representative, of which several specimens are cited, is *S. c. pennsylvanica* (Michx.) Clausen.

172. **Hydrangea arborescens** L.

Harold St. John (Rhodora 23, pp. 203-208, Sept. 1921) revises the

forms of this species and records 2 varieties from the D. C. region: the typical one "in silvis frequens prope Washington, D. C., July 15, 1888," Th. Holm; and var. *oblonga* T. & G., District of Columbia, Herbarium of A. Gray.

175. **Aruncus vulgaris** Raf.

M. L. Fernald (*Rhodora* 38, p. 181, May, 1936) notes that Rafinesque's proposals for this genus were *nomina nuda* and recognizes *A. allegheniensis* Rydberg as the valid name for the eastern North American species. The name *A. pubescens* Rydb. is segregated in its application to "an interior variety," yet plants with "the lower leaf-surfaces soft-pubescent" are cited from Washington, D. C. (Steele et al) and other eastern localities. "The really distinctive character of the variety is more slender follicles."

In September, 1939, the same author (*Rhodora* 41, pp. 423-424) points out that Walter described the American plant in 1788. The name is, therefore, changed to *Aruncus dioicus* (Walt.) Fern. var. *pubescens* (Rydb.) Fern.

176. **Potentilla canadensis** L.

According to M. L. Fernald (*Rhodora* 33, pp. 180-191, Sept. 1931), usage of this name reverts to that of Ward (*Flora* 1881), its application being to the plant called *P. pumila* in the 1919 *Flora*. Fernald records the typical variety from Bladensburg, Md., and Takoma Park, D. C.

176. **Potentilla simplex** Michx.

M. L. Fernald (*Rhodora* 33, pp. 180-191, Sept. 1931) returns to the usage of Ward (1881 *Flora*) in this case, this name replacing *P. canadensis* of the 1919 *Flora*. However, the specimens cited from our region are of a glabrate variety for which the name *calvescens* is proposed. A specimen from Naucks, D. C., June 1, 1913, Steele, is cited.

195. **Acalypha gracilens** A. Gray.

According to C. A. Weatherby's treatment (*Rhodora* 29, pp. 193-204, Oct. 1927) of this group, 3 instead of the usual 2 species are recognized, of which *digyneia* Raf. is that listed as *A. gracilens* in the 1919 *Flora*. This latter species is not recorded from our region by Weatherby. His citations are: *A. virginica*, Cabin John, Md., Oct. 10, 1912, Maxon; and *A. digyneia*, Bethesda, Md., Sept. 10, 1899, Steele. According to a later revision by Weatherby (*Rhodora* 39: 14-16, 1937), *Acalypha virginica* of his 1927 account becomes *A. rhomboidea* Raf. and *A. digyneia* becomes *A. virginica* L.

200. (Supl. 8, p. 47.) **Acer pseudo-platanus** L.

In September, 1930, E. S. Steele said in a letter "my record [of this species] probably was a misdetermination of the common Norway maple, of which I found seedlings."

204. **Ascyrum hypericoides** L.

M. L. Fernald (*Rhodora* 38, pp. 430-433, Dec. 1936) revises this aggregate, specifying 3 leading varieties of which var. *multicaule* (Michx.) is recorded from the District of Columbia.

219. **Conium maculatum** L.

The 1918 Flora says, "doubtfully established." One of an abundance of plants was collected near 26th and M Streets N. W., June 18, 1931, and the plant has been seen every year recently in the lower Rock Creek region. W. L. McAtee.

230. **Apocynum pubescens** R. Br.

Placed as a variety of *A. cannabinum* under the name *pubescens* (Mitchell) DC. by Robert E. Woodson, Jr. (Ann. Mo. Bot. Gard. 17 (1-2), 1930, p. 123) who records specimens from each of the 3 local jurisdictions.

230. **Apocynum speciosum** Miller.

Placed as a synonym of *A. medium* Greene by Robert E. Woodson, Jr. (Ann. Mo. Bot. Gard. 17 (1-2), 1930, p. 107) who cites specimens from the 3 political subdivisions of the D. C. region.

234. **Convolvulus sepium** L.

In treating the varieties of this species, R. M. Tryon, Jr. (Rhodora, 41, pp. 418-422, Sept. 1939) records a local specimen of *C. s.* var. *repens* (L.) Gray: District of Columbia, June 25, 1896, E. S. Steele.

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

Lincoln Constance (Rhodora 42, pp. 33-39, Feb. 1940) treats this species under the name *Ellisia nyctelea* L. and records specimens from Maryland, District of Columbia, and Virginia localities within our area.

239. **Verbena angustifolia** Michx.

This species is called *V. simplex* Lehm. by the latest monographer, Lily M. Perry, who records local material (Ann. Mo. Bot. Gard. 20 (2), April 1933, pp. 282-283).

261. **Valerianella locusta** (L.) Betsche.

Sarah C. Dyal (Rhodora 40, pp. 190-191, May, 1938) restores the name *Valerianella olitoria* (L.) Dufr. for our plant and records local specimens.

262. **Valerianella patellaria** (Sulliv.) Wood.

Long placed as a variety of *V. woodsiana*, this form was given specific rank by J. K. Small, action supported by Sarah C. Dyal (Rhodora 40, pp. 193-194, May, 1938) who records a specimen from "rich low meadow along the Potomac near Black Pond above Great Falls, May 24, 1925. N. Hotchkiss." It may be well to note that this is not the Black Pond of older collectors, a body of water near the mouth of Difficult Run, below Great Falls.

263. **Lobelia spicata** Lam.

Rogers McVaugh (Rhodora 38, pp. 305-324, Sept. 1936) treats this species under 5 varietal names of which *scaposa* n. var. covers the plants of our region. Specimens are cited from Maryland: Glen Echo, Pollard; Chevy Chase, Wherry; Rockville, Painter; Kensington, House; and "nr. D. C. line at Mass. Avenue," Bowen; from the District of Columbia, Henry, Comstock, Blanchard, Kearney; and from Virginia: Arlington, Mearns; Chain Bridge, Sheldon; Great Falls, Moore; and Occoquan, Randolph.

281. **Aster vimineus** Lam.

K. M. Wiegand (*Rhodora* 30, pp. 169-171, Sept. 1928) restricts this name in a varietal sense to plants of more northern range and proposes a new name var. *dubius* for those of more southern distribution including the D. C. region; a specimen collected at Hyattsville, Md., in 1914 by E. S. Steele is cited.

284. (Suppl. 7, p. 34.) **Gnaphalium obtusifolium** var. **helleri** (Britton) Blake.

The varietal name should be corrected to var. *micradenium* Weatherby, and the date to October 2, 1922. S. F. Blake.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA NEW CHIPMUNK OF THE EUTAMIAS AMOENUS
GROUP FROM NEVADA.BY E. RAYMOND HALL AND DAVID H. JOHNSON,
Museum of Vertebrate Zoology, University of California.

Chipmunks were well represented in the collection of mammals taken by the Alexander Nevada Expedition of 1909 in the Pine Forest Mountains of northern Humboldt County, Nevada. Lacking adequate material for comparison, Taylor (Univ. California Publ. Zool., 7 : 222, June 24, 1911) in his published report included the two species, *Eutamias minimus* and *Eutamias amoenus* of current nomenclature, under the name *Eutamias pictus*. Howell (North American Fauna, 52 : 65, Nov. 30, 1929) distinguished the two species in the mentioned collection and referred specimens of the species *amoenus* to the subspecies *monoensis*, which had been described by Grinnell and Storer (Univ. California Publ. Zool., 17 : 3, Aug. 23, 1916) from the Mono region of east-central California. The race *monoensis* was thus made to include populations from two areas separated by about 175 miles of desert not inhabited by *Eutamias amoenus*. This unusual distribution led us to examine the pertinent material, with the result that we found numerous differences, some of which were pointed out by Howell (*loc. cit.*, p. 66), between specimens from the two areas. According to our interpretation, each of the two populations currently assigned to *monoensis* is a restricted and independently evolved race peripheral to the wide-ranging subspecies *amoenus*. For the more northern race we propose the name:

Eutamias amoenus celeris, new subspecies.

Type.—Female, adult in fresh summer pelage, skin and skull; no. 7950, Mus. Vert. Zool.; near head of Big Creek, 8000 ft., Pine Forest Mountains,

Humboldt County, Nevada; July 21, 1909; collected by C. H. Richardson, Jr.; original no. 3198.

Range.—Higher parts of the Pine Forest Mountains of northern Humboldt County, Nevada.

Diagnosis.—Size small; color pale, particularly on edges and top of tail; skull narrow.

Comparisons.—From *monoensis*, as known to us by topotypes and other specimens from the southern Sierra Nevada, *celeris* differs in: hind foot shorter, tail slightly shorter, top of head grayer, light facial and dorsal stripes clearer white, ochraceous color of sides more intense, top and edges of tail paler, feet paler, skull narrower. From the subspecies *amoenus*, *celeris* differs in paler color of the sides and otherwise in the same ways as from *monoensis* although in each instance to a greater degree.

Remarks.—Individuals of this race average smaller even than *monoensis*, and these two races are the smallest and palest of the species. The pale coloration we interpret as a response to the arid conditions under which both subspecies live.

Howell (*op. cit.*, p. 66) referred one specimen from the Cottonwood Range [= Santa Rosa Mountains], the next range east of the Pine Forest Mountains, to *Eutamias amoenus monoensis*. In response to our inquiry about this record, Dr. H. H. T. Jackson sent us for examination a skin and skull, U. S. Nat. Mus., Biol. Surv. Coll., catalogue no. 80755, collected on September 17, 1896, by Clark P. Streater in the "Cottonwood Range." The label has stamped on it "*Eutamias a. monoensis*" but the specimen proves to be *Eutamias minimus scrutator*. Thus if, as we suppose, this is the specimen identified by Howell as *E. a. monoensis*, the reported occurrence of the species *Eutamias amoenus* in the Santa Rosa Mountains is based on a misidentification.

Measurements.—Average and extreme measurements of 5 adult males and 3 adult females are: Total length, ♂ 190 (187–194), ♀ 193 (189–195); length of tail, 83 (78–86), 84 (82–85); length of hind foot, 31.2 (30–32), 29.3 (29–30); condylobasal length of skull, 29.0 (28.6–29.3), 29.6 (28.7–29.2); greatest length, 32.5 (31.8–32.7), 32.2 (31.9–32.5); zygomatic breadth, 17.5 (17.3–17.8), 17.7 (17.6–17.8); cranial breadth, 15.0 (14.9–15.2), 15.2 (15.0–15.3); interorbital breadth, 7.5 (7.3–7.7), 7.3 (7.2–7.4); length of nasals, 9.6 (9.4–9.9), 9.9 (9.8–9.9).

Specimens examined.—Total number, 25, all from the Pine Forest Mountains of Humboldt County, Nevada, as follows: Alder Creek, 7000 to 8000 ft., 4; head of Big Creek, 8000 ft., 13; Pine Forest Mountain [= Duffer Peak], 8400 to 9400 ft., 6; ridge near Pine Forest Mountain, 2.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA NEW COTTON RAT (SIGMODON) FROM ARIZONA
AND NEW MEXICO.

BY SETH B. BENSON,

Museum of Vertebrate Zoology, University of California.

Specimens of cotton rats obtained in March, 1940, in the Huachuca Mountains of Arizona make possible the recognition of an heretofore undescribed race of *Sigmodon ochrognathus* Bailey ranging in southeastern Arizona and southwestern New Mexico.

Sigmodon ochrognathus montanus, new subspecies.

Type.—Male adult, skin and skull, no. 92287 Mus. Vert. Zool., collected at Peterson's Ranch (also called Sylvania), 6100 ft., Huachuca Mountains, 2 miles north of Sunnyside, Cochise County, Arizona, on March 15, 1940, by Seth B. Benson, original number 6649.

Distribution.—Known only from the Huachuca Mountains in Arizona and the Animas Valley in New Mexico, but probably also occurring in suitable habitats in the adjacent area.

Diagnosis.—A race of *Sigmodon ochrognathus* characterized by a sharply bicolored tail, hairs on inside of pinnae of ears tipped with yellowish, yellowish feet, small audital bullae, large ears. In *S. o. ochrognathus* the tail is only indistinctly bicolor, the hairs on the pinnae of the ears and on the feet are grayish, and the audital bullae are more inflated, the ears slightly smaller.

Color (Capitalized color terms after Ridgway, Color Standards and Color Nomenclature, 1912).—Dorsal surface grizzled gray tinged with yellowish ranging from Pale Ochraceous-Buff mid-dorsally to Ochraceous-Buff on flanks and rump. Belly hairs white-tipped. Basal portions of hairs Blackish Plumbeous. Nose and distinct ring around eyes Light Ochraceous-Buff. Tail sharply bicolor for most of its length, tipped with black. Hairs on dorsal surface of tail black, on ventral surface Light Ochraceous-Buff. Dorsal stripe on tail strongly accentuated by dark skin pigments. Hairs on inside of ears black, tipped with Light Ochraceous-Buff. Ear tufts Light Ochraceous-Buff. Feet tinged with Light Ochraceous-Buff.

The color in *S. o. montanus* is richer than in *S. o. ochrognathus* and is most evident on the ears and feet.

Measurements.—Two young adult males (type and a paratype, respectively): Total length, 233, 236; tail, 100, 106; hind foot, 28, 28; ear from notch, 18, 18; ear from crown, 14, 14; weight in grams, 73.1, 76.3; basal length, 27.8, 27.0; nasals, 11.3, 11.4; zygomatic breadth, 18.7, 17.7; mastoid breadth, 13.0, 13.0; alveolar length of upper molar series, 5.8, 5.9.

Specimens examined.—Total number, 7, as follows: *Huachuca Mountains, Cochise County, Arizona*: Peterson's Ranch, 6100 feet, 2 miles north of Sunnyside, 5; Head of Miller Canyon, 8400 feet, 1. *Animas Valley Hidalgo County, New Mexico*: 4 miles northwest of San Luis Pass, 5200 feet, 1.

Remarks.—Four of the specimens from the Huachuca Mountains and one from Animas Valley were tentatively referred to *Sigmodon hispidus cienegae* by Hall and Davis (Proc. Biol. Soc. Washington, vol. 47, February 9, 1934, p. 54). They pointed out the differences in color between the young specimens and *S. h. cienegae*, but did not name the variant because the immaturity of the specimens made it possible that the observed characters were not significant from a systematic standpoint. Actually, the young specimens are specifically distinct from *S. hispidus*. I visited the Huachuca Mountains to obtain adult specimens of the yellow-nosed cotton rats, and the Chisos Mountains of Texas for topotypes of *Sigmodon ochrognathus*, which had been described as a yellow-nosed species, to compare with the Arizona specimens. In spite of the strong geographic isolation between the two populations, and the differences in characters noted above, the populations are so similar in most features that it seems best to consider them as only subspecifically distinct.

The species *S. ochrognathus* has been recorded from only a few localities. Bailey (Proc. Biol. Soc. Washington, vol. 15, June 2, 1902, p. 115) recorded it from the Chisos Mountains, Texas, and from near Parral, Chihuahua. Blair (Misc. Publ., Mus. Zool., Univ. Michigan, no. 46, June 28, 1940, p. 32) recorded the species from the Davis Mountains of Texas. To my knowledge these are the only records for the species. Therefore, the records for New Mexico and Arizona are new and indicate a much more extensive distribution for this species than was formerly known.

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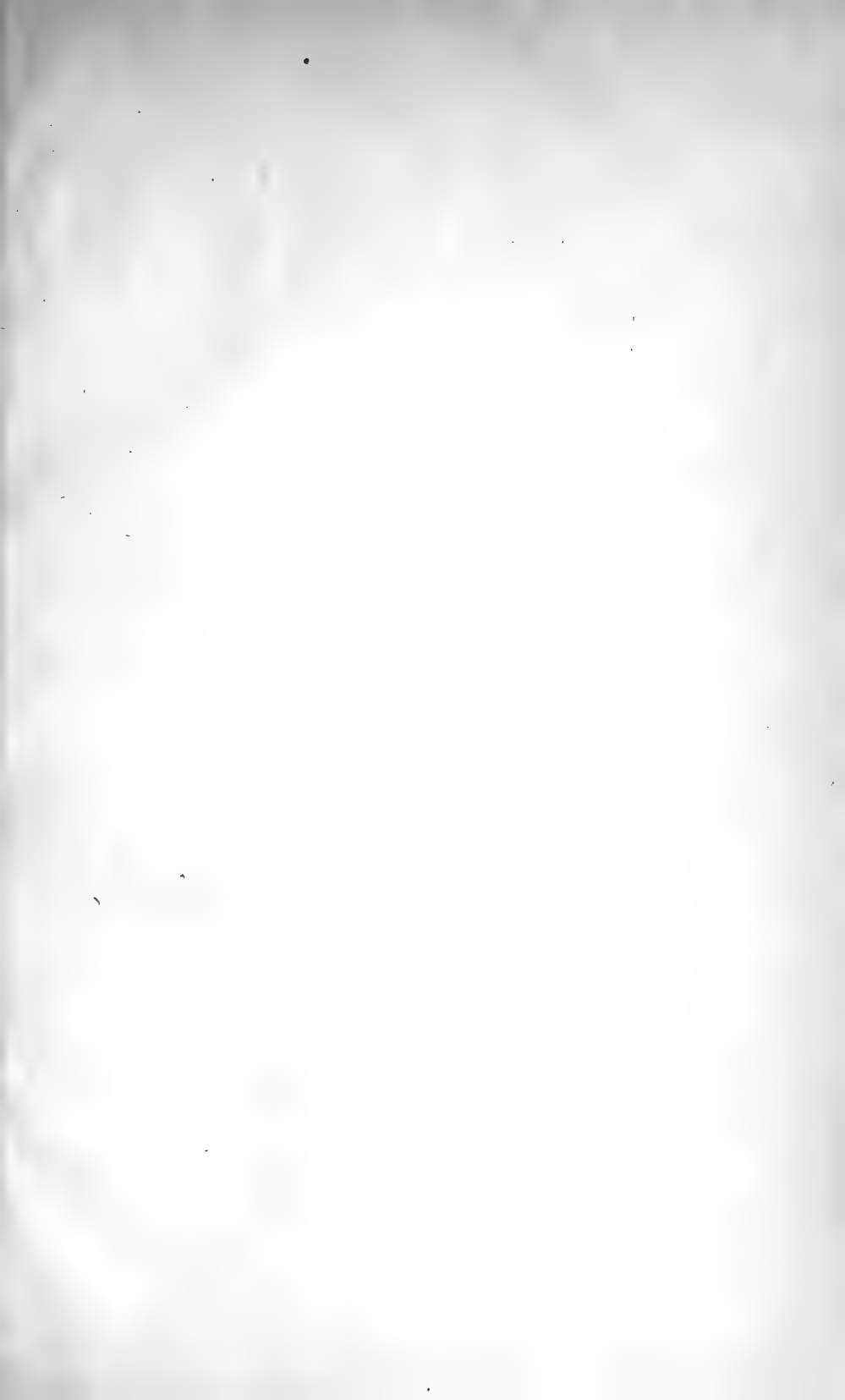
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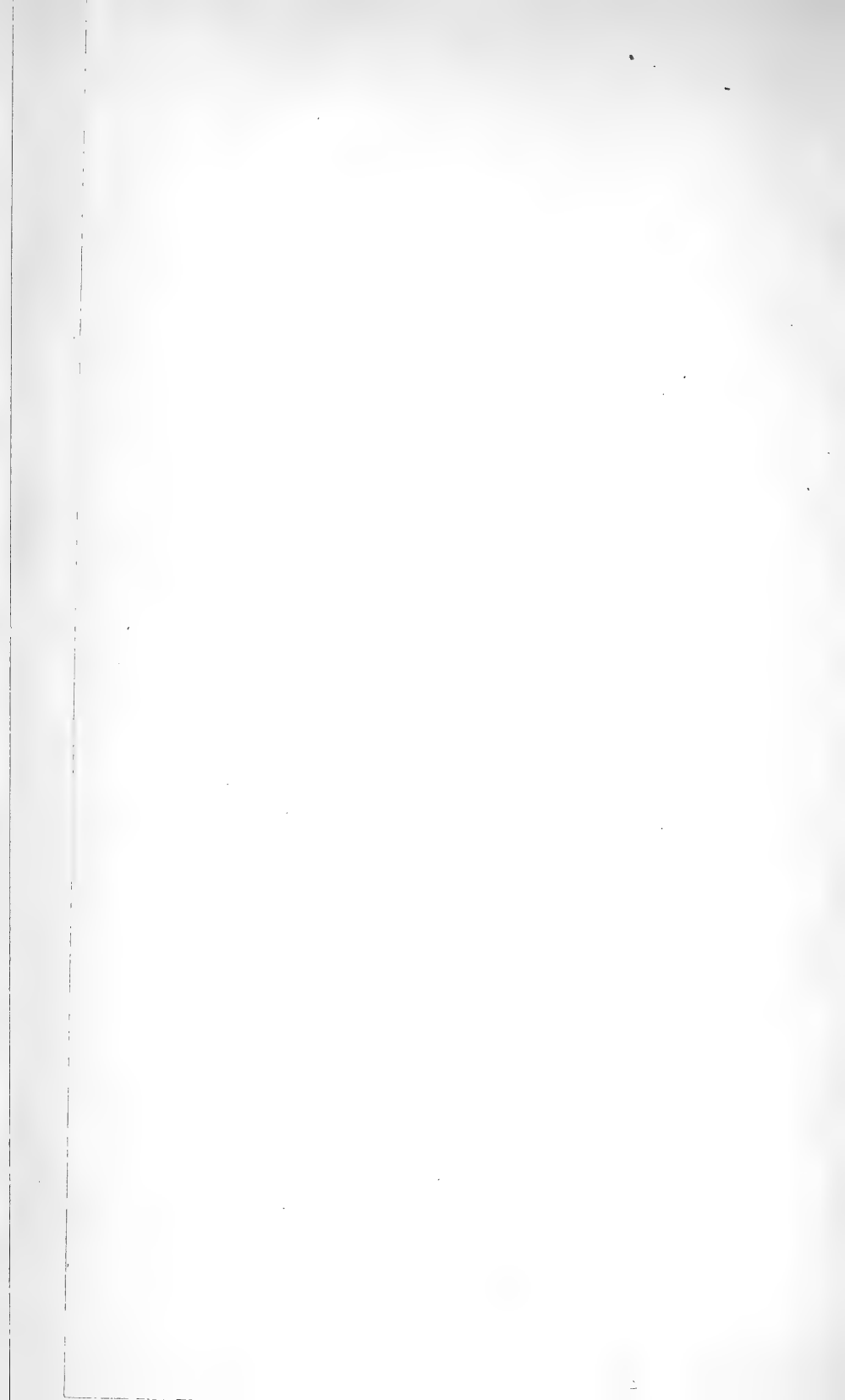
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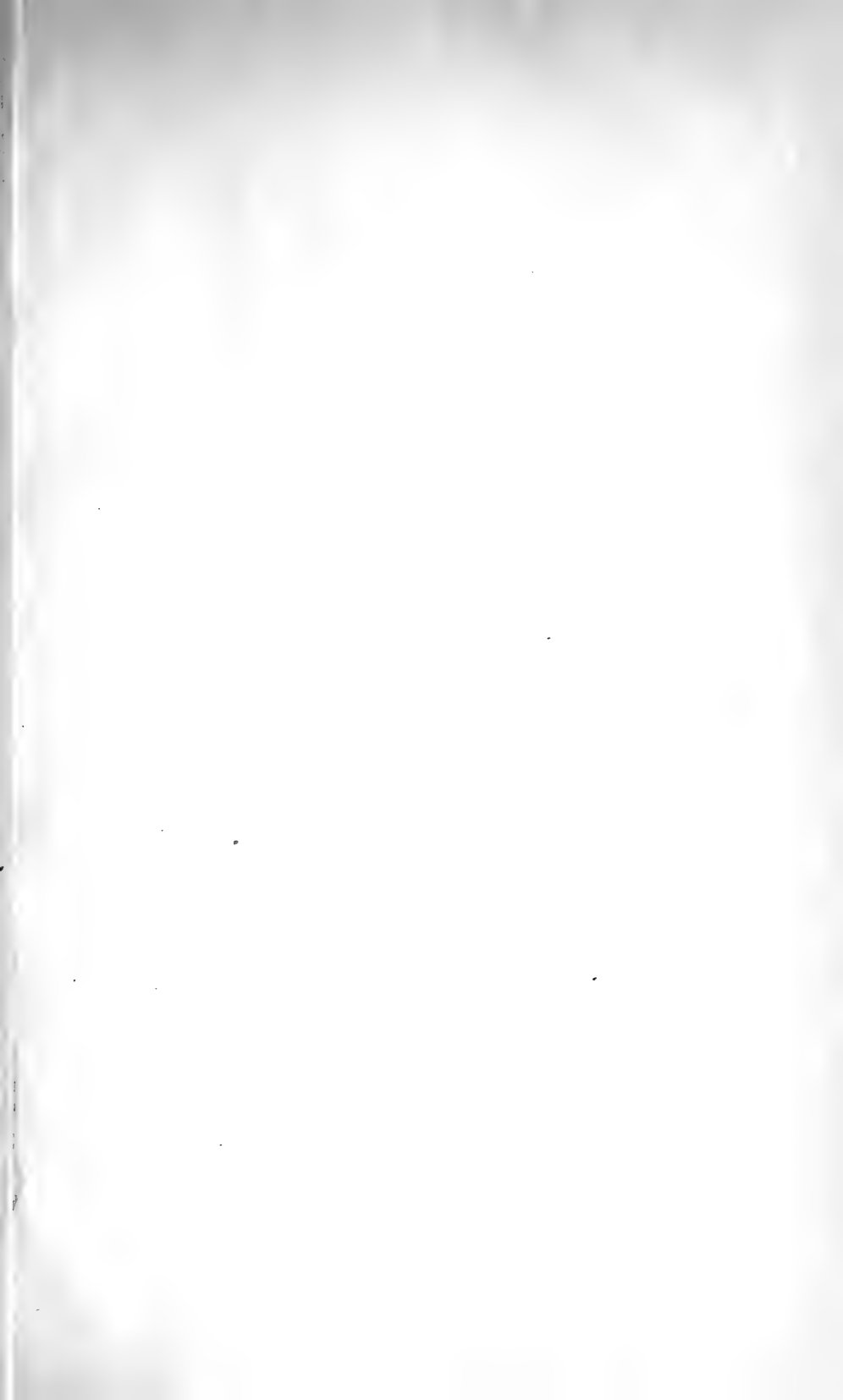
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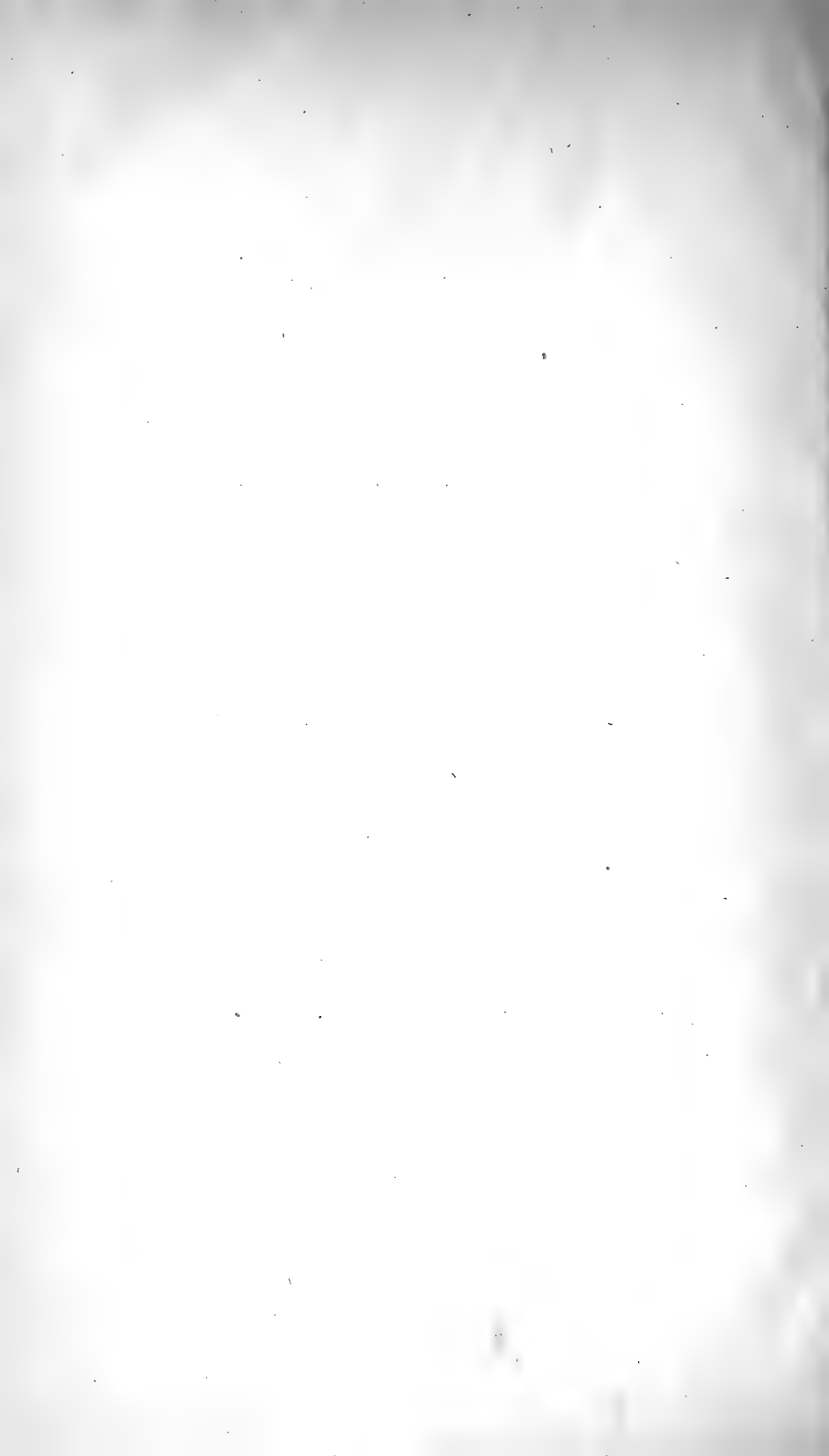
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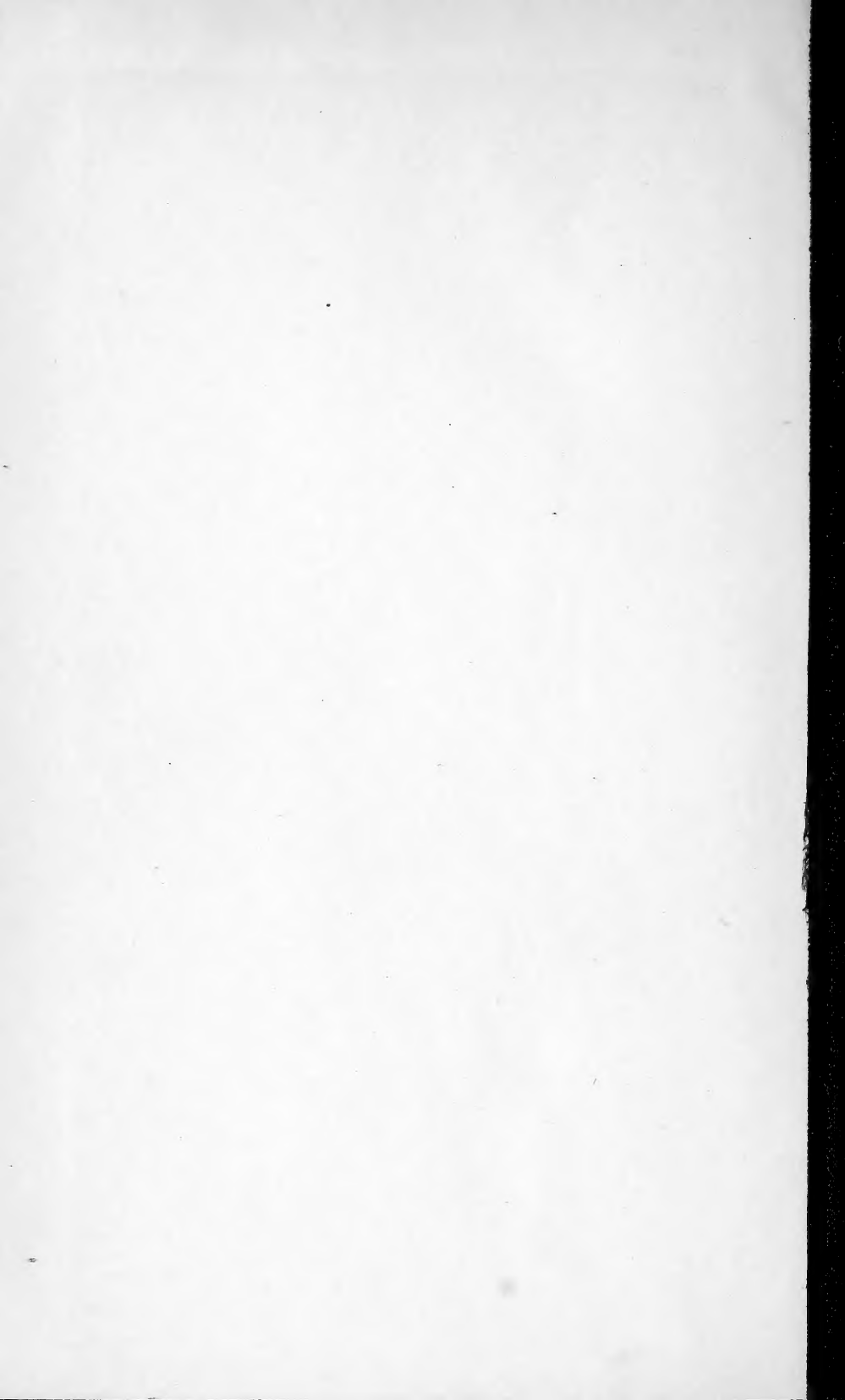
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